

**The adoption of Robotic Process Automation in a financial institution
in South Africa**

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ABSTRACT

For various reasons, most financial institutions in South Africa are adopting Robotic process automation (RPA). In South Africa, most of the financial institutions especially in the banking sector adopt RPA to enhance service delivery to provide effective and efficient services. Due to the high demand for innovative technologies in the banking sector, most banks are adopting RPA prematurely without proper understanding and planning on the adoption and implementation. This could be because of shortage of skills and lack of knowledge within the organisations. Furthermore, there are concerns from the workforce (employees) that the adoption and implementation of RPA could result to job losses due to most processes being automated replacing the human capabilities and skills sets. The use of RPA is not properly understood in financial institutions in South Africa and as a result has caused conflict between the technology and the workforce due to different interpretations on what adopting and implementing RPA means in the banking sector.

The aim of the study was to develop a model, which can be used as a solution to guide the adoption of RPA in financial institutions in South Africa, in a way that the organization and employees are in synergy in the adopting process. In achieving this aim, one South African banking institution was selected as a case and the case study approach was applied. Qualitative research methods were used to gain in-depth understanding of RPA within the financial institution. This was done through the interpretivist approach to understand the relation between the RPA and the workforce. Semi-structured interviews were conducted for data collection to allow for detail and understanding of the RPA adoption and implementation with the organisation. Data was analysed using the Technology Acceptance Model (TAM) as the lens to guide the data analysis process.

The TAM components namely, perceived usefulness (PU), perceived ease of use (PEOU), attitude towards using the technology (ATU) and actual system use (ASU) were used to guide the data analysis process. From the analysis conducted the RPA adoption model was developed and can be used to influence the adoption and implementation of RPA within a financial institution, six factors were found and used to create the model, namely; (1) Readiness assessment; (2) Legacy systems; (3) Integration of current systems with RPA; (4) Success factors – implementation and use of RPA; (5) Alignment between business requirements and RPA functions; and (6) Manageability.

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Robotic process automation (RPA) is as a software solution that is used by organisations to mimic human tasks or activities (Lamberton, et al., 2017). The term 'robotic(s)' creates an image of actual robots walking around in working environments and performing daily routines like humans, in fact the term 'robotics' in RPA context entails the automation of daily routine processes performed by humans (Lacity et al., 2015). The term "robot" is defined per software license (Willcocks et al., 2015). These software robots are built to replace human capability and they are referred to as 'robots', RPA robots (Moffitt, et al., 2018). An RPA 'robot' runs in the user interface and appears as if a human is busy interacting with computer systems (Petersen & Rohith, 2017).

The RPA 'robot' can process information (or data) in different formats such as text, picture, audio and video (Madakam, Holmukhe and Jaiswal, 2019). Moffitt, Rozario and Vasarhelyi (2018) suggest that built-in activities namely reading email, data scraping, type into, open and read file within the RPA tools such as UiPath, Workfusion, Automation anywhere etc. allow the RPA robots to read emails, open PDFs, get important information, enter in different systems, and alert the necessary people upon completion of task. To better identify with the term RPA, Madakam et al. (2019) define the RPA solution as the automation of structured repetitions of business processes performed by humans, including the processes that do not require thorough thinking, and can be easily mimicked by building the 'robot' that will perform rule-based processes that are carried out by humans.

Recent research studies report the benefits of the RPA, which include increasing productivity, reducing costs, improving speed, and error reduction (Accenture, 2017; Houy, Hamberg & Fettke, 2019; Lamberton, et al., 2017; Neelakandan, Tyagi & Nagalkar, 2019; Peterson & Rohith 2017; Schroer, 2016; Willcocks, et al., 2017). Despite the benefits that are associated with the RPA, there are concerns with regards to employments which emerge from the fear of employees being replaced by 'robots' (Frey & Osborne, 2017). These concerns emerge from the RPA technology's' intention to substitute human with machine, and lack of consideration for strong complementarity between human effort with robotics, in expanding efficiency, profit growth, and increase interest for work (Aguirre & Rodriguez, 2017). Thus, Koch and CSCA (2019) argue that the RPA does not replace a human being, instead, the solution enables an increase in productivity to ensure consistent processing of current processes. An RPA process cannot be creative and think 'out of the box' as a human being. Therefore, RPA aims at targeting repetitive tasks that do not add value to personal development. To elaborate, RPA for example would be best suitable for administrative

tasks of obtaining information from multiple applications, to obtain records of a new employee to an organization (Van der Aalst, Bichler & Heinzl, 2018). This automated process does not replace a human but instead frees them up to focus on more value driven processes.

1.2 PROBLEM STATEMENT

RPA is a technique that is more accurate and consistent than human effort. It reduces inaccuracy performed by humans. Unlike some parts of the world, currently, financial institutions do not know how to prioritise processes and when to use or apply RPA to enhance their productivity (Kamat, 2019; Vishnu, Agochiya & Palkar, 2017; Willcocks, Lacity & Craig, 2015). This factor could result from the lack of knowledge about RPA, which demonstrates from employees' fear that it could lead to retrenchments due to robotics taking over their jobs (Frey & Osborne, 2017; Stople et al., 2017). Research conducted does not show the integration of RPA with employees which may lead to employees resisting the use of RPA due to being misinformed about the technology and organisations not knowing how to put the two in synergy.

The problem is that South African banks do not know how and when to use or apply RPA. The banking institutions in South Africa continue to lose out from the benefits that the RPA presents. Losing out on benefits such as increased production, happy customers, higher profit margin, less processing time. As a result, the banking institutions in South Africa continue to lose out from the benefits that RPA presents, which include: (1) Capability of performing a variety of tasks and applications ;(2) Less time consumption in processing standardized routine tasks; (3) Happy customers due to short responses on customer requests; (4) More production and higher profit margin. These benefits address the challenges that affect South African banks' competitiveness at international level. In addition, the use of RPA can contribute to business and profit margin growth, increase opportunity for more employments, if applied appropriately. Thus, there is a need to conduct empirical study, which can guide the deployment and adoption of the RPA concept.

1.3 BACKGROUND TO RESEARCH

Changes in technology transform the working environment, including the nature of professions and how tasks are executed (David, 2015). In many quarters, the RPA programming is considered an ideal for substituting humans in carrying out processes and activities such as taking data from one set of systems (e.g., email) into another system for other purposes (Lacity, et al., 2015). However, Fernandez and Aman (2018) argue that RPA does not replace humans but relieves them from tedious nonvalue adding tasks to be able to focus on learning new skills that require human intelligence. Many studies have examined, and some concluded that the adoption of the RPA will lead to vulnerable and loss of jobs (David, 2015; Frey & Osborne, 2017; Gerbert et al., 2017; Koch & CSA, 2019). Most Organisations know the introduction of robotics will lead to job losses, because

if an employee performed rule based routine tedious tasks that can now be performed by a robot, then there is no need for that person anymore. Which has led to some organisations reassuring their employees that the percentage of outsourced resources will drop to avoid retrenchments (Gerbert et al., 2017).

The adoption of the RPA can contribute to the high unemployment rate in South Africa, which is currently at 27.7% if the South African labour force is not willing to upskill (Schreck, Weilbach & Retsma, 2020). RPA adoption may impact the South African labour force as it can replace humans through the automation of rule-based processes. Willcocks, Lacity and Craig (2015) state that employees are contradicting with two realities namely fear of being replaced by a robot and complaints around tedious rule-based tasks. Therefore, Employees should focus on upskilling themselves to tasks that require human intelligence which makes it close to being impossible to replace them with robots. As with other disruptive technology innovations, organizations must learn to manage RPA adoption to achieve maximum results (David, 2015).

On one hand, some adopters of the RPA find it beneficiary in that the automation has drastically changed their back offices, lowered costs expenditure while improving service quality, expanding compliance, and decreasing delivery time (Willcocks, et al., 2017). On another hand, many organizations have not fully experienced the benefits RPA brings to their business (Kirchmer & Franz, 2019; Vishnu, Agochiya & Palkar, 2017; Willcocks, Lacity & Craig, 2015). The idea of RPA contributes to the scepticism of employee involvement experienced by financial institutions in South Africa. Financial institutions have seen the benefits of RPA through processes they have automated such as the detection of fraud alerts, report generation, reconciliation of accounts etc. To name a few, Madakam, Holmukhe & Jaiswal (2019) state that Deloitte conducted a study where a bank automated their claiming process with 85 robots that replaced an estimation of 200 employees. Hunter and Willcoks (2017) state that a case study was done in an insurance institute where a process took two days to be completed by a human but 30 minutes when completed by a robot.

Even though organizations are still looking for approaches to cut expenses (referred to as sustained cost transformation), RPA is currently seen to swiftly cut down expenses while performing a high Return on Investment (ROI) (Van der Aalst, et al., 2018), one of the South African financial institutions has explored the adoption of the solution. "Implementing RPA for a single finance unit, function, or site is a good test and may be enough to produce an acceptable ROI" (Koch & CSCA, 2019, p. 68). Automation as an emerging technology should be implemented with enhanced training of how to manage the robots, audit trails, reporting, security and monitoring (Kamat, 2019). Organisations must upskill employees to a point where they understand sharing

the workload and supporting robots (Gerbert et al., 2017). Organisations should learn to prioritise processes based on cost reduction and continuous improvement (Halaška & Šperka, 2020). Therefore, there is a need for a model that can assist financial institutions to adopt and use RPA.

1.4 AIM AND RESEARCH OBJECTIVES

The aim and objectives of the research are presented as follows:

1.4.1 Aim of research

The aim of the study was to develop a model, which can be used as a solution to guide the adoption of RPA in financial institutions in South Africa, in a way that the organization and employees are in synergy in the adopting process.

1.4.2 Research objectives

Based on the aim of the study as stated above, the following objectives were formulated:

- I. To gain an understanding of the factors that influence the adoption of RPA in the context of financial institutions in South Africa
- II. To establish the requirements for the adoption of the RPA as a solution for financial institutions in South Africa.
- III. Based on findings from the above objectives, a model was developed, to guide the adoption of the RPA solution.

1.5 RESEARCH QUESTIONS

This section presents the main and sub-question of the research:

1.5.1 Main research question

The main question is: How can an RPA adoption model be developed to guide the adoption of RPA in financial institutions in South Africa?

1.5.2 Research sub-questions

The research sub-questions are as follows:

- i. What are the factors that influence the adoption of RPA in the context of financial institutions in South Africa?
- ii. What are the requirements that can be used to guide the adoption of the RPA in South African financial institutions?
- iii. How can an RPA adoption model be used to guide the adoption of RPA in financial institutions in South Africa?

1.6 LITERATURE REVIEW

This section presents review of literature, focusing on the core aspects of the study, which include banking services, adoption of technology, and RPA in financial institutions.

1.6.1 Banking services

Banking services are regarded as one of the vital services of every economy around the globe and thus there is a need for banks to adopt new technologies (Kalra & Jain, 2018). The most recent two decades have seen a wave of innovation by adopting technology to enhance daily banking routines and services (Bhatt & Bhatt, 2016). The innovation of electronic banking (E-Banking) services in banking sector including the innovation of e-wallet, online banking; mobile banking, etc. creates support and straightforwardness in daily banking routines (Iberahim, et al., 2016; Kalra & Jain, 2018). Bhatt and Bhatt (2016) argue that some customers withhold from using any of the E-Banking services due to the lack of knowledge, identity theft, and security concerns. Furthermore, privacy and security are customers' major concerns in E-Banking and can lead to dissatisfaction of customers if not taken into consideration (Kalra & Jain, 2018). Joshi and Joshi (2019) argue that the increase in innovation in the banking sector leads to consumers comparing banks and as their desires are not satisfied, they are probably going to switch over to different banks.

Banks have experienced a strong online presence from their customers, and this enables clear indications for analysis of customer service delivery and satisfaction (Dauda & Lee, 2015). The banking sector has seen a drastic change in communications by using smart devices to enable mobile banking services offered by the banks for ease of access and mobility for their customers (Baptista & Oliveira, 2015). Lu, et al., (2015) state that Mobile technologies are the most ongoing technological innovations in banking services. However, Dauda and Lee (2015) arguably state that banks have not forecasted what their customers will prefer in the future for E-banking.

1.6.2 Adoption of technology

Tarhini, et al., (2015) state that a user must undergo five steps before adopting new technology and the first step is to make the technology known, secondly to convince the customers, thirdly to make the customers decide on the technology, fourthly is to be ready to implement the technology and lastly to confirm the readiness of the technology. The way customers adopt and use technologies such as online banking varies across different communities and cultural backgrounds (Tarhini, et al., 2015). However, customer services that ensure the best customer experience affect the adoption of new technology, one happy customer spreads good news and so is one unhappy customer that can damage the banks' reputation (Nguyen, et al., 2015).

Gupta and Khanna, (2015, p. 218) conducted a study which tested the connection between internet banking adoption and "its six factors, namely awareness, ease of use, security, cost, reluctance to

change and accessibility” and discovered that the customers readiness for adoption of new technologies were lower than what banks have anticipated. Moreover, older adults struggle with many technological systems and this is not due to complexity or price but could be affected by different variables (Lee & Coughlin, 2015). Tarhini, et al., (2015) states that the adoption of new technologies for the banking sector is never a simple adventure. Moreover, the banking sector may simply miss the mark on the capacities expected to assess new technologies as they get to the market (Bircan & De Haas, 2015). Therefore, concluding that banks may expect that financing innovations will dissolve the estimation of guarantee on their old legacy systems, which leads to the reluctant to change and unwillingness to adopt new technologies (Bircan & De Haas, 2015).

1.6.3 Robotic process automation in financial institutions

Researchers refer to RPA as technology and some refer to it as an approach, an approach or technology to improve business processes, reduce costs and increase productivity (Amini, 2019). Madakam, Holmukhe, and Jaiswal (2019) state that RPA is the new language and if companies do not make use of this emerging technology in its daily operations, they may not be able to compete with their competitors. The best benefit of RPA is the reduction of processing time spent within highly repetitive processes (Moffit, et al., 2018). However, the main reason for the use of RPA is reducing labour costs, minimizing errors, increase productivity and create better customer experiences (Madakam, et al., 2019). Different Sectors are deploying this technology or approach across the globe; this includes manufacturing industries, chemical plants, the healthcare sector, telecommunication, financial sector, etc. (Madakam, et al., 2019).

For example, financial services have seen the benefits of RPA due to its nature of manual, high-volume, repetitive, rule-based processes involving unstructured and structured data (Accenture, 2017). Petersen and Rohith (2017) make an example of a construction engineering business that sends over 500 invoices to customers per month and gets supporting information from different systems. To process each invoice per customer in the past it will take up to 5 hours now reduced to 11 minutes per invoice after the implementation of RPA, saving the business money and increasing productivity. Schroer (2016) from National aeronautics and space administration (NASA) states that NASA is looking into the capabilities and use of remotely piloted aircraft using RPA. Businesses, however, need to enforce prioritization of what is high-volume and time-consuming providing the business and managers a correct understanding of what can be automated with less complication or human decisions (Amini, 2019). The use of RPA in financial institutions has been proven to increase production and efficiency especially in high volume tasks that do not require human intelligence and can easily be done using artificial intelligence (Romao, Costa & Costa, 2019).

The role of the RPA technology in financial institutions has been seen to have a good impact on boosting team morale by drastically removing tedious tasks from employees and creating a relationship between software robots and employees on tasks that the robot's handover to employees for completion (Stolpe et al., 2017). Financial institutions are always under pressure to perform tasks efficiently in a swift manner as they deal with money and should always have accurate processing. The use of RPA has provided financial institutions the power and ability to run processes 24/7 without any interruptions or any issue of fatigue as the software robots can accurately and efficiently run processes for unstated length of time (Kumar & Balaramachandran, 2018). Customer satisfaction is the main priority for financial institutions and RPA provides the ability to accurately, efficiently and swiftly process customers' requests to offer great services and products (Kamat, 2019).

Figure 1.1 below demonstrates how RPA can be useful in the back and front-end processes. The sections are divided as 10% which covers the traditional process automation such as Business process automation (BPA), 70% RPA candidates and 20% of cases of which 20% (work that can only be performed by humans) is handed over to humans or can be implemented with AI robotics solution. Davenport and Kirby (2016) state that the reason why most organisations choose to use RPA is due to the technology having the ability to enhance employee performance. Organisations need to explain the use and limitations of RPA to employees so that they understand that there are use cases that still require human capabilities and cannot be automated (Lacity & Willcocks, 2017). Once organisations and its employees reach a point of understanding about the RPA the better it is to roll out the technology and have employees supporting it with understanding of what is achievable and what is not (Romao, Costa & Costa, 2019). Agostinelli, Marrella and Mecella (2019) state that the importance of this technology is proven by the automation of high-volume processes in short time intervals compared to processes being run by humans.

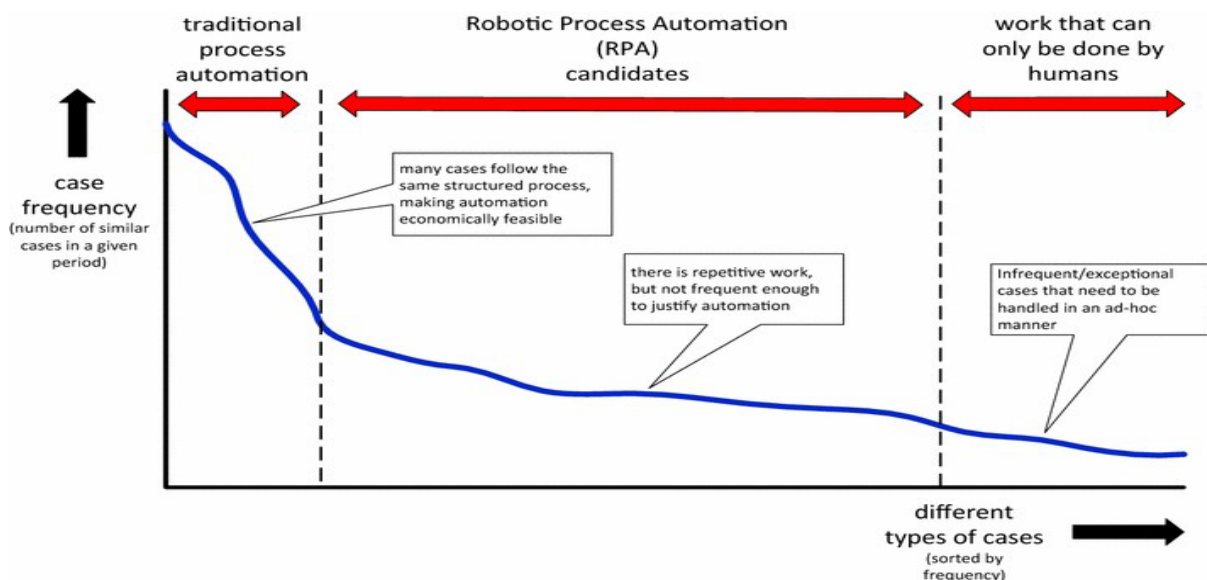


FIGURE 1.1: RELEVANCE OF RPA IN BACK OFFICES (VAN DER AALST, BICHLER & HEINZL, 2018, P. 270)

The major limitation of RPA is that it is rule-based and can only process structured information (Petersen & Rohith, 2017). Amini (2019) emphasizes that matching automation of RPA to the right process is difficult and can be regarded as a special skill. However, Petersen and Rohith (2017) state that organizations should start by automating day to day repetitive back-office tasks that employees find tedious and of high volume and importance requiring no human intelligence. Lacity, Willcocks and Craig (2015) stated a definition that “Back offices are where the operational support systems for services are created, managed, and delivered” (Lacity, et al., 2015, p. 3). Back offices from highly competitive industries like telecommunications, utilities, financial services, healthcare, and government organizations are constantly pressured to reduce costs and increase productivity (Van der Aalst, et al., 2018).

RPA interacts with the user interface just as a normal employee would and through an application programming interface (API) when needed to access applications through backend programming. Therefore, RPA can be implemented and deployed without changing what a normal user would do to perform their daily operations (Petersen & Rohith, 2017). Osmundsen, Iden and Bygstad (2019) argue that one of the main challenges with the deployment of RPA projects is organizations’ not having objectives and future goals to drive these initiatives moving forward. This is a huge issue as Lamberton, et al., (2017) state that many organizations can demonstrate the capabilities of RPA, but a few organizations deploy those demonstrations. However, RPA production deployments are hosted on the cloud, cloud computing brings security and privacy challenges which brings concern in the data security space (Willcocks, et al., 2017). Osmundsen, Iden and Bygstad (2019) state that businesses are caught in between reducing the challenges and maintaining the benefits of

RPA deployments. However, as with all new technology innovations, organizations must figure out ways to ensure RPA accomplishes most extreme deployments (David, 2015). RPA programming is suited to replace humans for so-called “swivel chair” processes; processes where humans take inputs from one set of systems (e.g., email), process those inputs using defined sets of rules to enter the outputs into systems (Lacity, et al., 2015).

David (2015) argues that the exchange among robots and human cooperating creates room for creativity among humans and chances to enhance intelligence in human-driven processes. Van der Aalst, Bichler and Heinzl (2018) argue that automation replaces employees. However, Aguirre and Rodriguez (2017) argue that automation additionally supplements work and does not replace employees, but rather ensures that employees work on intelligent work. In parallel, automation opens possibilities for employees to think outside their comfort zones by performing work that requires human interaction and leaving the automation to deal with rule-based activities. Unfortunately, RPA is a new and emerging technology that came as a big shock to the working environment, creating many concerns that led to less user acceptance (Oliveira, 2016).

1.6.4 Technology Acceptance Model (TAM)

TAM was Davis in the year 1985 as part of his doctoral dissertation which he improved from the Theory of Reasoned Action (Lee, Kozar & Larsen, 2003). The model was created around the users’ motivation and the proposed model is shown below in Figure 1.2, where the dominant variables are Perceived Usefulness, Perceived ease of use and attitude towards using any technology (Davis, 1985).

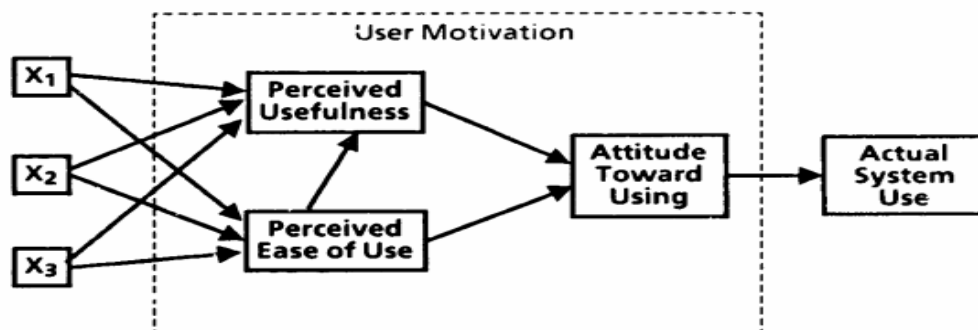


FIGURE 1.2: ORIGINAL TECHNOLOGY ACCEPTANCE MODEL (TAM) (DAVIS, 1985)

TAM considers different variables to assess how users adopt and use a particular technology (Davis, 1993). The factors that influence the acceptance of technology are clearly defined in TAM to clearly cover all variables when conducting the assessment (Tarhini et al., 2017).

1.7 RESEARCH DESIGN AND METHODOLOGY

The research design and methodology that was applied in this research are discussed in this section. This includes approaches, methods, designs, data collection and analysis techniques.

1.7.1 Research approach

Based on the objective, which was to develop a model to guide RPA adoption, the inductive approach was employed. This means that theory was not tested. As a result, neither the deductive nor abductive approaches were followed in this study. Leckie & Zukerman (2014, p. 422) explained that inductive “does not require a complete and tractable domain theory to be encoded and has the potential to create more effective rules by learning from more than one example at a time”. Therefore, this research made use of inductive reasoning to observe, create patterns and develop a model to be used for the adoption of RPA in financial institutions.

1.7.2 Research methods

The quantitative methods, qualitative methods, and the mix methods are commonly applied in information systems (IS) and computer science research (Rocco, et al., 2003). Quantitative methods apply numerical logic into data analytics to calculate the average and spread of data (Yudin, et al., 2015). Qualitative methods portray meaning to identify and describe the content of data (Yudin, et al., 2015). MacLeod (2016) portrays qualitative methods as subjective research as an emotional component that recognizes the substance of the persons' experience instead of what may have caused the learning occasion. While quantitative methods can provide an overview of data analytics in numbers, qualitative methods produce insights to the data. Mixed methods combine numbers and facts. (Shekar, et al., 2019).

The study applied qualitative research methods to understand how financial institutions in South Africa adopt RPA and how employees perceive the use of RPA. Qualitative research methods were used for this study to get an in-depth understanding of the functions of RPA in the context of financial institutions in South Africa. This was done from the interpretivist approach' viewpoint. The interpretivism approach seeks to understand the relationship of people to the subject matter at hand (Goldkuhl, 2012).

1.7.3 Research design

The Case Study approach was applied. The case study approach is proposed for instances where speculations are at their developmental stage (Wamba, et al., 2015). The case study approach was selected primarily because it allows an in-depth investigation of a phenomenon (Yin, 2011). One financial institution in South Africa will be used in the study. This is to gain deeper understanding of how to adopt the RPA solution in a financial institutions' environment. Criteria

was used to select the financial institution, which include access to the organization; and the organization has or about to adopt RPA.

1.7.4 Data collection

Data was collected using semi-structured interviews, which was conducted through face-to-face interviews with employees from both IT and business units that are involved with the RPA solution within the financial institution. This is primarily because the semi-structured interviews are used widely to explore, to pay attention to details, fundamental suspicions, development, and expansive applications to qualitative and mixed-method technique research (McIntosh & Morse, 2015).

1.7.5 Data analysis

Data analysis is the use of analysis techniques or machine learning algorithms to make sense of data to result in findings (Aho & Frondelius, 2017). Data was analysed using TAM. This means that TAM was used to primarily focus on:

- i. organization's (employer and employees) knowledge of the RPA
- ii. employees' perception about the ease of use of the RPA for the organisation's processes and activities
- iii. willingness to employ the RPA for their processes and activities in the organization.

The model, TAM implies that the information is analysed based on the different variables that impact the users' acceptance of any technology (Chuttur, 2009). This helps to gain an understanding of the factors that can possibly influence the adoption of the RPA in an organization.

1.8 ETHICAL CONSIDERATION

The study aims to focus on one bank as a case study, which for ethical reasons will be referred to as Misuzulu Bank (pseudo name). Participants were selected from the IT department. Managers in the Robotic process department were contacted because they have the knowledge of the business processes and structure of the department. Developers in the IT team were contacted to gain first hand exposure to using Robotic process automation. The researcher scheduled a meeting with the head of robotics to allocate individuals who will volunteer to participate in the study and the individuals will be a mixture of senior and junior staff members which include managers, solution architects, project managers and developers. No individuals were forced to act in an involuntary manner by use of threats or force.

1.9 SIGNIFICANCE OF THE STUDY

This study is significant in two main ways: (1) it adds to the existing literature, particularly from South African and developing countries perspectives. Currently, there are very few literatures about the adoption of RPA in financial institutions, especially in developing countries. (2) the study is intended to benefit both IT and business personnel in the financial institutions primarily because it will help them to gain better understanding of the factors that influence the adoption of the RPA in their environments. This includes how the solution can be adopted complementarily with human workforce.

1.10 DELINEATION OF THE STUDY

The study is limited to adoption of the RPA in the financial institutions within the South African context. This means that the study focuses on financial institutions, and that other aspects of RPA such as programming are excluded from the scope. Also, the study does not include the entire developing countries or the world at large.

1.11 CONTRIBUTION OF THE STUDY

This research aims to contribute theoretically and practically to the body of knowledge. Theoretically, a model was developed. At the time of this study there seem to be no model that can be used to guide the adoption of RPA in South African financial institutions. Also, the study will add to existing literature. Practically, the study will empirically reveal the factors that influence the adoption of the RPA in financial institutions. These factors can be used as guide and terms of reference by other developing countries.

1.12 STRUCTURE OF THE THESIS

The thesis will be structured into five chapters as follows:

Chapter 1 – This chapter introduces the entire thesis. This includes the research problem, objectives and questions.

Chapter 2 – This chapter discusses existing literature review.

Chapter 3 – This chapter discusses the research design and methodology.

Chapter 4 – This chapter discusses the overview of the case.

Chapter 5 – This chapter discusses the data analysis and interpretation.

Chapter 6 – This chapter discusses the interpretation of findings.

Chapter 7 – This chapter concludes the study.

1.13 CONCLUSION

There is a gap of knowledge arising from the lack of in-depth research on RPA behind how employees fear the technology and how organizations introduce and implement RPA (Willcocks & Lacity, 2016). The gap identified is the organization and employee synergy in adopting RPA. This has resulted in a contradiction of two realities due to the promotion of fear based on the lack of knowledge and one will overwhelm the other. Organizations need to be transparent with employees by conducting studies around the technology and ensuring that everyone understands its capabilities of what it can and cannot perform. (Oliveira, 2016). The fear of RPA replacing humans should arise when RPA is enhanced with AI and Machine Learning (ML) as this would mean that robots are trained to act and think as humans would (Petersen & Rohith, 2017). For example, an RPA robot should be able to function as intended to even when a 'submit' button that it clicked on moved from the left to the right side because it still exists within the interface just changed positions (Van der Aalst, et al., 2018).

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the review of literature, based on the objectives of the study, as stated in chapter one. The review focuses on the key aspects of the study: banking, robotic process automation (RPA), technology adoption, and technology acceptance model (TAM), which is the theory that underpins the study.

The remainder of this chapter is structured into six main sections. The first and second sections cover banking services and technology adoption, respectively. The third section focuses on robotic process automation in the context of banking institutions. Technology acceptance model, the theory that underpins the study, is discussed in the fourth section. In the fifth section, the use of TAM in information systems (IS) study is discussed. Finally, a conclusion is drawn.

2.2 BANKING SERVICES

Banking services can be defined as activities in which banks protect the money of customers and businesses to loan out the money to other customers to generate profit from interests (Kewenig, 2017). Banking services are categorised into four main different types: Individual banking, business banking, digital banking and loans (Abor et al., 2019). Individual banking refers to different services that are tailored just for individuals' personal use, namely, savings, cheque, and trust accounts (Tam & Oliveira, 2017). Each of these accounts requires different rules, processes, and management, entailing the use of various resources. Also, some of the accounts are more challenging than others. Business banking refers to different services tailored for a business to have separate personal and business accounts for transactional monitoring purposes (Dorrestijn & Hartley, 2019). Digital banking is banking on the go, referred to as electronic banking (E-Banking). This means that customers can transact online via the internet through their mobile devices, computers, etc. (Madhavan, 2018; Martín, Insaugarat & Mencía, 2011). Lastly, a loan is a process in which a bank lends money to customers for repayment with an agreed interest rate and over a period (Abor et al., 2019).

The banking industry is one of the most competitive industries that should remain relevant and fast-paced by adopting new technologies (Boonsiritomachai & Pitchayadejanant, 2017). Adopting new technology enables banks to stay relevant and competitive in the fast-paced environment to keep up with their customers' demands around the clock. (Plattfaut, 2019). There are a lot of back-office processes in the banking environment process, such as paying out cheques, processing payments, customer onboarding, etc. (Crosman, 2018). This has led to banks adopting the use of RPA to enhance their back-office operations and highly repetitive rule-based tasks (Lacity,

Willcocks & Craig, 2015). RPA is defined as the use of software robotics to mimic user-movements on the computer to free humans from rule-based tedious work that requires human thinking to be executed (David, 2015). With the use of RPA, banks have seen a shift in their processing time and response time to all back-office processes. A robot can process in one hour, a task that would take a human being one day to complete. (Van der Aalst, Bichler & Heinzl, 2018).

The banking sector has two main challenges: advanced technology and remaining relevant in a competitive market (Roy & Vishwanathan, 2018). The banking sector is challenged by the new era of technological disruptions, such as automation and innovations (Roy & Viswanathan, 2018). Banks are technologically challenged because most of their legacy systems cannot keep up with the fast-paced technology environment (Malini & Menon, 2017). However, banks are willing and are inventing technological innovations to enhance their operations (Thaker et al., 2019). Hewamadduma (2017) states that with the adoption of new technologies, such as E-Banking, banks are challenged to provide adequate security to all the customers that use E-Banking, including those using internet banking, mobile banking, and services such as cardless money transactions. Obinna et al. (2017) argue that customers who do not have smartphones and still make use of SMS banking are at risk of being scammed. This is done by forms of using Unstructured Supplementary Service Data (USSD) to send text instructions.

Using the internet exposes customers to being scammed and cyber criminals are always a step ahead in planning online scam attacks (Mishra & Mathuria, 2017). Therefore, it is vital for banks to always warn customers by educating them on ways to prevent online scams (Kuncoro & Kusuma, 2018). However, the banking sector always ensures that security for their customers is a priority to ensure that all transactions are safe and secure (Jain & Soni, 2017). Kuncoro and Kusuma (2018) argue that banks ensure a high level of security for mobile banking, considering incidents of customer mugging for their mobile device or losing the device. To provide a secure environment for banking services, a password authentication approach was implemented to grant access to users. However, many customers experience a similar problem of forgetting their passwords. The banks' main problem was enquiries on how to create a strong and secure password that customers would not forget (Sharma & Mathuria, 2018).

E-Banking has advanced through ICT development by using e-wallet, mobile, and online banking (Sathitwiriawong & Phuttaraksa, 2018). Years ago, before the discovery and implementation of E-Banking, customers could only access banking operations through Automatic Teller Machines (ATM) or by visiting their nearest banking branch (Sathitwiriawong & Phuttaraksa, 2018). The use of ATM imposed challenges on the banks, especially security concerns, such as ATM bank card fraud, which entails cloning a customers' card to withdraw money (Alemu, 2019). The use of ATM

banking required customers to find the nearest ATM with the “make transactions” options, to make electronic transactions, which in today’s era is unnecessary, as technology has created convenient ways of E-Banking (Sathitwiriawong & Phuttaraksa, 2018). However, at the time, the ATM method of bank transactions ensured security by using bank card pin number verifications to verify the customer (Pelegero, 2018).

The use of information and communication technology (ICT) has changed all business sectors by providing innovative ideas that influence their way of business, making banking to be considered as the heart of any fundamental economy and ICT as its spirit (Rauf, Rauf, Mehmood & Kamboh, 2018). The banking sector is one of the most fast-paced sectors and thus there is a need to try different approaches of technology to create easy banking for customers (Chmielarz & Zborowski, 2018). Basic banking services play a huge role in customers’ daily banking needs and contributing to improved means of support (Dittrich et al., 2017). The banking sector plays a huge role in all businesses and will always be considered as an essential services sector in every economy (Bhati, 2019).

E-Banking is defined as different ways of delivering banking services to customers through online channels that are accessed via cell phones and computers by using the internet (Rauf et al., 2018). Mishra and Mathuria (2017) define E-Banking as banking services facilitated online using the internet for all customers. Karim (2019) states that E-Banking is an approach that was implemented by banks through e-communication channels for banking services. E-Banking has introduced new ways of banking which have drastically changed the old traditional banking approaches that required all customers to visit the branch whenever they had to use any banking service (Rauf et al., 2018).

Research shows that E-Banking is mostly implemented in developed countries, compared to less developed countries, due to a lower access to smartphones and the internet (Han, 2020). E-Banking requires customers to use the internet and it is an advantage to technologically advantaged customers (Karim, 2019). Using mobile banking has increased over the number of years as most customers prefer the new ways of mobile financial services. However, customers are vulnerable to being crime targets because of mobile banking (Kuncoro & Kusuma, 2018). Furthermore, the more mobile banking is used, the more demand there is on banks to improve their existing E-Banking platforms, which entails upgrading existing processes (Han, 2020). For governance purposes, the payment department and settlement systems permitted banks to provide mobile banking services such as USSD, internet banking, and banking with mobile banking applications (Sharma & Mathuria, 2018).

One of the most used E-Banking services is internet banking. Rauf et al. (2018) define internet banking as an online platform through which customers can utilise various types of banking options such as making electronic payments, applying for a loan, and checking bank balances. Peng-Yu and Xiao-Xiao (2017) define internet banking as a self-service platform for customers' daily banking needs. Hewamadduma (2017) defines internet banking as an online banking facility that allows a registered customer with a valid username and password access to perform banking activities anytime. Sharma and Mathuria (2018) argue that internet banking has raised security concerns regarding the safety of customer accounts and personal information.

Banks have introduced options to use biometrics systems that authenticate by either obtaining a face image or fingerprints of a user to compare the captured information against the customer information stored in the banks' database to ensure that an authorised user is accessing the application (Jain & Soni, 2017). Another biometric option is voice biometrics which enables voice-based banking for all customers that are struggling with navigation through banking options on mobile devices (Dittrich et al., 2017). Jain and Soni (2017) argue that the use of biometrics has exposed customers to hackers. Hackers are defined as unauthorised users that unethically access systems or applications to scam customers.

Therefore, banks occasionally require customers to always have their banking cards present to enable the two-factor authentication whereby the card reader requires the users to enter their personal banking pin number to identify them (Hewamadduma, 2017). Rajarajan et al. (2018) argue that PIN authentication is also risky, as cyber attackers can access the PINs through programmes such as keylogging. One of the most common techniques used by criminals is using keylogging. A keylogger is a programme that records all steps taken by a customer when using their mobile banking application, which leads to customers being scammed (Kuncoro & Kusuma, 2018).

Furthermore, banks are most likely targeted through cyber-attacks, which refers to crimes committed using the internet (Kuncoro & Kusuma, 2018). Hewamadduma (2017) states that the growth in the number of customers using E-Banking services has created an alarm that attracts cybercriminals, leading to customers being victims of identity theft. Phishing is also one of the tactics used by cybercriminals. Phishing is the use of social engineering whereby customers are misled to share their personal information by providing them with links, competition rewards, and through phone calls claiming to be from a legitimate organisation asking for confidential information (Hewamadduma, 2017).

To ensure that legitimate owners are the only ones accessing customer accounts, banks enforced the use of an OTP (One Time Password) which is generated every time a customer wants to log

in to use either internet banking or mobile banking (Mishra & Mathuria, 2017). Furthermore, banks have implemented the visual cryptographic technique which encrypts customer information and stores the information inside images that can only be decrypted by human visual software (Jain & Soni, 2017). Banks have also implemented a process that performs suspicious transaction monitoring, referred to as Anomaly-based detection, to ensure that such transactions are blocked, and the accounts are frozen until the end of investigation and remediation (Hewamadduma, 2017).

The concept of E-Banking is argued to be a fast-paced environment with great benefits and is also a critical hazard for banks due to security concerns (Peng-Yu & Xiao-Xiao, 2017). Customers are mostly attracted to banking services that provide great user experience (Peng-Yu & Xiao-Xiao, 2017). E-Banking has provided access to banking services that are available 24 hours a day, 7 days a week and 365 days a year for ease and convenience of banking. (Han, 2020; Mishra & Mathuria, 2017; Sharma & Mathuria, 2018). Furthermore, E-Banking provides customers with lower banking transaction fees which encourage customers to make use of the service and save (Han, 2020). The ease of use and convenience in the comfort of your own home has drawn more attention to customers and banks reaping the benefits of attracting more customers (Hewamadduma, 2017).

2.3 ADOPTION OF TECHNOLOGY

Technology adoption is defined as the means taken in the process of exploring and trying innovation(s) (Sepasgozar & Loosemore, 2016). Adoption means practical use of an innovation. Innovation is referred to as the finding of new a product, way, or approach to assist in improving a product or services (Chavas & Nauges, 2020). Adoption occurs through various means, such as volunteerism or contractually (Cataldo et al., 2016). An individuals' willingness to learn new things enhances the adoption of technology (Bukchin & Kerret, 2020). Thaker et al. (2019) state that technology is used by banks to run their internal and external business operations. Kannam, Punithavathi and Sambandam (2018) state that the important aspect of the adoption of technology is for organisations to understand the adoption procedure before using any technology. Raflesia, Surendro and Passarella (2017) declared that the adoption of technology is costly and there is no certainty that the technology purchased will be appropriate and return a profit for the organisation. Ikeda and Morita (2020) also state that the adoption of technology has a lot of blockers that result in adoption being expensive and challenging.

Researchers have seen the importance of conducting a study that underpins the adoption of technology to understand the advantages and disadvantages (Safeena & Kammani, 2018). However, Danquah and Amankwah-Amoah (2017) argue that despite all the studies conducted by

researchers, there is still limited knowledge of the adoption of technology in developing countries. Lee and Hidayat (2019) argue that developing countries are not so fortunate with keeping up with the rate of technology adoption compared to developed countries. Researchers concluded, through an observation and comparison of the use of the internet, that developing countries are moving slowly due to cost implications involved in adopting the use of the internet. Therefore, the more researchers conduct studies that unfold the adoption of technology the better it is for organisations to understand the need to use new technologies (Malhotra & Singh, 2007).

For organisations to adopt new technology, they also must undergo a five-step development lifecycle. The first step is to understand what is required to begin development, the second is to design the requirements, the third is to implement the design, the fourth step is to perform a user-acceptance test and, lastly, the fifth step is to adopt the new technology in a production environment and maintain the technology (Hamid, 2018). Wang, Chen and Chen (2017) conducted a study to review how old adults adapt to technology and the findings show that older adults are not as inquisitive as young adults, which therefore leads to them not having much interest in new things and resisting change that would make them uncomfortable. However, Mitzner et al. (2019) state that researchers have seen that technology assists old adults in different sectors but there is still a low number of old adult adopters compared to the young generation. Lee and Hidayat (2019) state that the young generation is described as computer literate and willing to learn as and when new technologies are introduced to keep up with the fast-paced growth environment.

A study conducted on how students leverage technology for their studies establishes that older students are more fearful than students fresh from high school when it comes to adopting new technologies (Staddon, 2020). Staddon (2020) states that recent high school joiners in university find the use of technology to be very valuable as it makes learning easier, convenient and flexible, whilst mature students find it challenging to adapt, use, and learn new technologies. However, all students are encouraged to seek methods to best use technology to their advantage and to adapt and learn as much as they can through innovative ways and solutions (Lee & Hidayat, 2019).

Some researchers argue that school teachers are also culprits when it comes to resistance to change and do not make use of technology to enhance their teaching methods even though the technology is capable of simplifying ways of teaching (Aldunate and Nussbaum, 2013). Technology enhances teaching and learning without borders and that creates a seamless process for teachers and learners to collaborate and communicate at any given time (Ali & Alam, 2020). Lee and Hidayat (2019) argue that not only does technology help teachers facilitate their online classes, but it also assists by involving everyone in one platform to share and distribute knowledge to a wider

audience. Education has been revolutionised by technology through online learning and computer programmes that enhance academic learning (Kannam, Punithavathi & Sambandam, 2018).

Gender and age are mostly combined in research because in the IT environment, it is more likely that young males are more trusted than older males due to older people being uncomfortable and reluctant to learn new ways of working. It is the same with young female's vs older females (Orser & Riding, 2018). Gender is a determiner that assists in collecting statistics on the adoption of technology (Park et al., 2019). Age and maturity in the industry play a huge role in an individual's perception of technology adoption (Dowdy, 2020; Khanal, 2019). Orser and Riding (2018) argue that despite the age variable for adoption, gender also plays a huge role as a factor that powers the adoption of technology. Women are more interested in adopting new technologies than men. Education is also a huge variable that determines an individual's willingness to learn (Khanal, 2019).

Technology is adopted by different sectors across the globe, such as agriculture, education, the construction industry, etc. (Kannam, Punithavathi & Sambandam, 2018; Michler et al., 2019, Nnaji et al., 2019; Rani, Mani & Vidhyavathi, 2019). The benefit of technology adoption in agriculture is seen in the improvement of efficient production in agricultural activities (Michler et al., 2019). Organisations need to differentiate the options of adopting technology based on the recommendations of each sector i.e., the technologies that work in the mining industry might not be efficient in the financial sector (Macher, Miller & Osborne, 2020). Technology has made everything convenient in working spaces, from manually operating a business in paper formats to using computers to communicate and run businesses (Kannam, Punithavathi & Sambandam, 2018).

The use of technology has enabled banks to remain connected with other industries that affect their decision making as financial services (Malini & Menon, 2017). The financial sector is under pressure to adapt to technological innovations, not only as a means of advancing daily operations for service delivery, but also for competing with other global market competitors (Bhati, 2019). Due to the high use and adoption of technology in the financial sector, there has been a growth in financial technology firms which are referred to as FinTechs (Malini & Menon, 2017). FinTechs are focused on developing and implementing user-friendly products and services by providing and enhancing innovative ideas for the financial sector to provide improved services (Malini & Menon, 2017). Arvila et al. (2018) state that several researchers focused on studies that explain the benefits of adopting technology from the early stages of using and adopting mobile phones. However, there is still a shortage of research that describes the selection of technology based on the different backgrounds of users of the technology (Lee & Hidayat, 2019).

Most organisations fail to adopt new technologies due to lack of knowledge, skill requirements to keep up with the fast-paced environment, lack of management expertise in new technologies and fear of failure in using the new technologies (Orser & Riding, 2018). These factors make some countries' statistics to show an increase in the adoption of technology and some to show a decrease, depending on the knowledge of technology (Danquah and Amankwah-Amoah, 2017). However, the most challenging phase of adoption is influencing individuals to support a new technology as there is always uncertainty (Kannam, Punithavathi & Sambandam, 2018). Aldunate and Nussbaum (2013) argue that the reasons most organisations are sceptical in adopting technology are high costs and delayed benefits. Sajić et al. (2017) state that banks have access to a variety of technologies but do not know how to use and implement the technologies.

The more banks invest in technology the more efficient and swifter the provision of banking products and services with fewer labour costs (Safeena & Kammani, 2018). The adoption of technology has brought new horizons to banks by empowering IT and easing communication internally and externally, and offering trustworthy and fast services (Bhati, 2019). The adoption of technology opened doors for the financial sector to create banking services such as E-banking (Bhati, 2019). The power of technology enables bank users to be able to bank in the comfort of their homes without visiting the branch as they did before the implementation of E-Banking and the use of technology (Sajić et al., 2017). The implementation of electronic banking has opened room for technologies such as automation that enables the support functions to provide swift responses to customers, amongst many other advantages (Bhati, 2019).

The financial sector does not know how to efficiently adapt to new technologies to provide the best products and services to their customers (Bircan & De Haas, 2020). However, Caviggioli et al. (2020) state that even though there is uncertainty in adopting new technology, most organisations have been encouraged to adopt it to improve existing business processes. Technology adoption has become a global trend that can be developed and shared with other businesses across the globe (Bircan & De Haas, 2020). However, the process for technology adoption by organisations and how it can be gradually implemented in phases have not been thoroughly considered (Aldunate & Nussbaum, 2013).

2.4 ROBOTIC PROCESS AUTOMATION IN FINANCIAL INSTITUTIONS

The concept of Robotic process automation (RPA) provides computer-generated employees, referred to as robots, to automate repetitive rule-based tasks that do not require human intelligence for processing, to enhance productivity and efficiency (Geyer-Klingeberg et al., 2018). The concept

is derived from business process automation (BPA) technology which is the automation of processes (Madakam, Holmukhe & Jaiswal, 2019). RPA is defined as the holistic end-to-end automation of a process to update a business for effortlessness (Rizk et al., 2020).

The robot refers to the machine programmed to carry a sequence of activities. The process is the transformation of input to output, and the automation is the practice of running a process at the push of a button (Madakam, Holmukhe & Jaiswal, 2019). This is attributed to why RPA is referred to as the automation of business processes through instructions processed by software robots (Schmitz, Dietze & Czarnecki, 2019). RPA falls under the umbrella of artificial intelligence (AI). AI is using and training computers to think and work like humans (Mehrotra, 2019). Romao, Costa and Costa (2019) define RPA as the use of AI to perform repetitive, high-volume processes that can easily be automated to replace humans. Recently, the adoption and implementation of RPA have been trending in the academic and business world (Gao, Van Zelst & Lu, 2019).

The most favoured reason behind this technology is the ability to imitate human tasks while interacting with any user interface (Montero, Ramirez & Enríquez, 2019). Schmitz, Stummer and Gerke (2019) refer to RPA technology as 'smart automation'. The term RPA is not associated with programmed robots that wander around like humans but rather a programmed software that mimics human actions through interactions with systems and applications (Shehu & Abba, 2019). One of the main concerns around technological innovations is employees' reluctance to upskill to keep up with the trending technologies (Roy & Viswanathan, 2018). This is a major concern because with the new technologies, such as RPA, not everyone can keep their jobs as this technology can replace humans (Romao, Costa & Costa (2019).

It is essential for employees to remain relevant in the new innovation-driven world. They need to upskill to remain relevant (Bukchin & Kerret, 2020). Organisations' use of RPA has triggered fear of job loss in the market and how organisations can introduce the technology in a way that will not cause reluctance to use and adopt the technology needs to be understood. This study uses TAM as a lens to understand both the employer and employee's perspective of the RPA technology.

The combination of AI and RPA amounts to intelligent process automation (Zhang, 2019). RPA and AI are changing traditional banking activities to be more exciting and are transitioning daily working routines for employees to be productive in less tedious tasks (Sivagananathan, 2016). Gupta, Rani and Dixit (2019) define RPA as a programme that processes steps in a defined order without human assistance to fulfil an outcome. There are two options to RPA technology. The first option is a robot that is not assisted, which means that the robot runs the process end to end (Gupta, Rani & Dixit, 2019). The second option is an assisted robot that requires human intervention to finish or start the process. RPA completely or incompletely imitates movements

performed by a human, using mouse clicks and keystrokes to accomplish certain tasks across one or multiple platforms (Romao, Costa & Costa, 2019). RPA activities do not only include mouse clicks and keystrokes, but they also include activities such as optical character recognition (OCR), Citrix environment interactions, web recording, etc. (Chalmers, 2018). However, Schmitz, Dietze, and Czarnecki (2019) argue on the importance of organisations to only automate high repetitive tasks to see the important role of automation and to save costs.

Banks are always under pressure to remain competitive in the market and to produce services efficiently and effectively 24/7. Therefore, banks have implemented RPA for different uses. For instance, banks applied RPA to improve the trade clearance procedure, data entry processes, clerical functions, detection of fraudulent activities, monitoring of processes, transactions monthly reporting, statement processing, accounts processing, etc. (Crosman, 2018; Kumar & Balaramachandran, 2018; Mahashree, 2020; Sivagananathan, 2016; Vishnu, Agochiya & Palkar, 2017). Banks have automated back-office processes such as the processing of cash deposits, statement requests, invoicing, etc. (Mehrotra, 2019). Bedekar and Satpathy (2019) state that RPA is used not only on back offices but also from front-office operations, such as consulting and purchasing to back-office processes, such as invoice processing, planning, data analytics, etc. RPA has revolutionised processes in different departments such as IT, audit, finance, marketing and engineering. (Rai et al., 2019).

Public administration has seen a drastic change and improvement in data extraction processing for trade tax valuation (Houy, Hamberg & Fettke, 2019). Supply chain management has been processing most of its operations using an RPA robot for speed in processing time and efficiency (Neelakandan, Tyagi & Nagalkar, 2019). Leno et al. (2020) state practical examples of what organisations could automate, such as reading emails and responding to them based on defined responses, a process where an individual downloads a report from the web and manipulates the data to create a month-end report, and performing calculations and data analytics on excel, etc. Mehrotra (2019) and Morrison (2019) state that RPA saves cost, time, and enhances productivity.

The replacement of humans is a requisite since automation is progressively imitating human skills and capabilities (Mehrotra, 2019). Zhang and Liu (2019) argue that RPA in banks has matured, replacing humans to a point where most bank branches are being considered for shutdown. The contradiction about RPA is that it requires a human to teach the robot how to perform tedious tasks (Chalmers, 2018). However, Bedekar and Satpathy (2019) state that employees should not be worried about losing their jobs but should be on the lookout as to where and how they can add value that requires human intelligence. Romao, Costa and Costa (2019) state that employees should rather be more focused on serious processes that cannot be mimicked by a robot and

requires critical thinking. Therefore, employees should not panic or discard RPA but rather accept it as an assisting technology (Phillips & Collins, 2019). RPA releases employees from repetitive processes to improve swiftness and add more value (Romao, Costa & Costa, 2019).

RPA as a technology can either create panic or celebration mode and this is a decision that everyone must make, depending on how they view the technology and understand its capabilities (Phillips & Collins, 2019). Just like a software project, an RPA project also has a lifecycle that starts with the business analysis of the process, the development, and deployment of the robot (Jimenez-Ramirez et al., 2019). Leno et al. (2020) and Kim (2019) state that unlike software projects that require intensive coding, RPA has tools, namely, Automation Anywhere, Blue Prism, Work Fusion and UiPath that are easy to use and require minimal coding experience. These RPA tools can integrate with other technologies such as application programming interfaces (API) to pull, push, and update relevant information and fields (Kim, 2019). Organisations have seen a shift in their daily operations and an improvement in productions (Kobayashi et al., 2019).

RPA development is not stable as it mostly runs on the user interface which can be unstable and sometimes has no testing environment. Therefore, robots need to be in intensive hyper care and monitored to avoid any complications (Montero, Ramirez & Enríquez, 2019). Jimenez-Ramirez et al. (2019) argue that deploying an RPA robot requires intensive monitoring that logs all instances processed and alerts raised in case of exceptions that must be remediated. Romao, Costa and Costa (2019) state that monitoring RPA processes is mostly required in instances where the user interface changes or is updated and the developer must update the robot to recognise the changed interfaces. Since RPA operates mostly on the user interface, any big change(s) that the business does not pick up in its monitoring process could result in undesirable costs (Chalmers, 2018).

RPA projects can be implemented and hosted swiftly as no infrastructure is required for any of the projects (Van Chuong, Hung & Diep, 2019). Järvi (2020) states that all RPA project deployments are hosted on the cloud and require organisations to know cloud infrastructure and services which involve licensing at extra costs. Notwithstanding the cost savings, RPA enriches reporting for organisations due to accurate performance measurements (Leshob, Bourgouin & Renard; Schmitz, Dietze & Czarnecki, 2019).

A concern raised by most organisations is that RPA is not governed by the information technology (IT) department, which means that organisations do not have much control over the technology (Osmundsen, Iden & Bygstad, 2019). The technical literature on RPA is still limited because it is a new technology (Ivančić, Vugec & Vukšić, 2019). As much as RPA is a big buzz in the industry, organisations fail to use the technology to its complete prospect (Kirchmer & Franz, 2019). RPA

reconstructed processes automation by introducing unpredicted techniques that create advantages and disadvantages that raise fears amongst both employees and employers (Mehrotra, 2019). Studies have been conducted on the use and implementation of RPA; however, researchers have concluded that organisations require new approaches to govern RPA projects (Gustafsson & Lundcrantz, 2020).

The use of RPA is rapidly expanding across all sectors (Mehrotra, 2019). This is due to RPA being user friendly. The technology does not require a change in systems or infrastructure as it operates as a human would in the user interface and sometimes does not even touch any system but processes through APIs (Romao, Costa & Costa, 2019; Van Chuong, Hung & Diep, 2019). Gupta, Rani and Dixit (2019) contend that no organisation would resist a technology that can operate 24 hours 7 days a week. Therefore, organisations utilise RPA to enhance productivity, value, and customer approval (Plattfaut, 2019). RPA is a developing technology that automates tedious tasks performed by humans. However, organisations still have no framework that guides the adoption and implementation of RPA (Leshob, Bourgooin & Renard, 2018). Therefore, organisations are willing to do whatever it takes to enhance speed of production, efficiency, and effectiveness (Gustafsson & Lundcrantz, 2020).

2.5 TECHNOLOGY ACCEPTANCE MODEL

Technology Acceptance Model (TAM) is a theory that is based on the Theory of Reasoned Action (TRA) (Lee, Kozar & Larsen, 2003). Although the focus of this review or section is not TRA, it is necessary to briefly discuss it. This is primarily to provide a trajectory about TAM as the merging of TRA and TAM resulted in the defined three-user motivations (perceived usefulness, perceived ease of use, and attitude toward using) based on acceptance and reasoning about a technology (Lai, 2017). TRA is mainly used to predict human actions based on their own points of view, context and goals (Taherdoost, 2018). TAM is an acceptance model to evaluate a user's adoption and use of a technology (Tarhini et al., 2017).

Through its four main components, the TAM focuses on the motivation of users in the acceptance and use of technology in an environment. As shown in Figure 1.2, the components are (1) Perceived Usefulness, (2) Perceived ease of use, (3) attitude towards using, and (4) actual system use (Davis, 1985).

How the user accepts the technology is discovered through different variables as follows:

- i. Perceived Usefulness

Perceived usefulness can be defined as a shift in attitude depending on the advantage a technology has in assisting with job performance (David, 1985). Taherdoost (2018) defines perceived usefulness as the user's inspiration towards using a technology. Lai (2017) states that perceived usefulness is the potential probability of a user's utilisation of a technology which is a core driver to determine any system use. Perceived usefulness is how much an individual accepts that utilising a specific technology is of assistance in adding value to their job and performance (Chuttur, 2009). This study examines the participants' perceived usefulness of RPA for their daily operations and how RPA enhances their performance.

ii. Perceived ease of use

Perceived ease of use is defined as how the user finds comfort in using a technology (David, 1985). Every individual is interested in using a technology that is user-friendly and not complicated (Taherdoost, 2018). Ease of use is how much the potential system's user anticipates that the objective technology should be easy (Lai, 2017). To understand the use of RPA, this research examines the users' experience and how users feel about using RPA to enhance daily operations.

iii. Attitude towards using

Attitude towards using is defined as how an individual views using technology (David, 1985). Attitude towards a technology plays an enormous role in a user's acknowledgment of a technology (Taherdoost, 2018). The attitude of an individual towards a technology might be impacted by different elements, such as feelings and approach towards something new (Lai, 2017). To examine the attitude towards using RPA, this research examines the users' way of thinking around using RPA.

iv. Actual system use

Actual system use is defined by the user's attitude, the comfort, and usefulness of a technology. If a user finds the technology easy to use, makes working better, and increases performance, then that user is more likely to adopt that technology (David, 1985). A user can either approve or disapprove of a technology and that decision is based on the attitude towards using that specific technology (Taherdoost, 2018). The actual system use component is to understand how users feel about the technology and if users' do intend to use it.

Many researchers have used TAM to examine the worth of a technology, its security, and customers' confidence in using the technology (Alwan & Al-Zubi, 2016; Balaaoriya, Wibowo & Wells, 2017). TAM considers different variables to assess how users adopt and use a particular technology (Davis, 1993). The factors that influence the acceptance of technology are clearly defined in TAM to cover all variables when conducting the assessment (Tarhini et al., 2017). TAM is the most applied model when analysing an adoption or acceptance of a technology and was

established to recognise all the factors that influence a user's adoption of a particular technology (Mitzner et al., 2019; Sathitwiriawong & Phuttaraksa, 2018).

2.6 TECHNOLOGY ACCEPTANCE MODEL AND INFORMATION SYSTEMS STUDIES

Technology acceptance model has been widely used by researchers to underpin users' motivation to use any technology (Aboelmaged & Gebba, 2013; Boonsiritomachai & Pitchayadejanant, 2017; Hassan, Iqbal & Iqbal, 2018; Min & Jeong, 2019; Rigopoulou, Chaniotakis & Kehagias, 2017). According to Sekgweleo, Makovhololo and Iyamu (2017), the theory has been used over 60,000 times in IS studies. Some of the studies in recent years are cited here. Boonsiritomachai and Pitchayadejanant (2017) made use of TAM to underpin the factors that contribute to bank customers adopting the use of mobile banking. TAM was used by Min and Jeong (2019) to conduct research for understanding how uber users adopted using the uber application to request a metered uber taxi car. Hassan, Iqbal and Iqbal (2018) examined the factors that influence the adoption of internet banking using TAM. Rigopoulou, Chaniotakis & Kehagias (2017) applied TAM in their study that investigated the adoption of smartphones amongst young customers.

In IS research, the theory is often employed primarily to understand how perceived usefulness, perceived ease of use, attitude towards using and actual use of the technology influence users' adoption of a certain technology. Bresciani and Eppler (2015) applied TAM to analyse data for evaluating how users perceive, use, and view information. Gefen, Karahanna and Straub (2003) conducted an IS research that evaluated how users find online shopping experience using TAM as a lens, based on usefulness, ease of use, attitude towards, and actual use of online shopping platforms. In the financial sector, Muchran and Ahmar (2019) used TAM to evaluate and analyse the number of users that had registered and were using internet banking and to visualise the users' experience. In IS research, TAM is used to understand and evaluate the users' experience of a technology and to draw a conclusion based on their perceived usefulness, perceived ease of use, attitude towards using, and actual use of the technology.

2.7 CONCLUSION

The literature review is comprehensive in that it covers all the key aspects of the study as highlighted in the beginning of the chapter. The most relevant literature in the key areas of the study are RPA, financial institution and South Africa. Also, the review is conducted in a cohesive manner that enables logical flows. The comprehension and cohesion helped to identify some of the gaps in the phenomenon being studied. An example is the lack of knowledge by organisations of the capabilities of RPA, which created fear on employees regarding job security. The next chapter discusses the vehicle through which the research was carried out.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research methodology applied in this study. The research methodology consists of methods, approaches, designs, and techniques. Each aspect of the methodology was selected based on the aim of the study, as presented in chapter 1: to develop a model, which can be used as a solution to guide the adoption of RPA in financial institutions in South Africa, in a way that the organization and employees are in synergy in the adopting process. In achieving the aim, empirical evidence was required of the employees. This guided the selection of the methodology.

This chapter is sequentially divided into 6 main sections. The first and second sections focus on philosophical assumptions and research approaches. In the third and fourth sections, research methods and research designs are discussed. How the data was collected and analysed, including the unit of analysis, covered in the fifth and sixth sections. Finally, the chapter is concluded.

3.2 PHILOSOPHICAL ASSUMPTION

Philosophical assumption in research is about developing a study through ideas and information gathering. Therefore, a philosophical assumption is used to underpin the study to provide a perspective on the research conducted. Picou (2015) states that a philosophical assumption is used in research as a lens to guide theory. Håkansson (2013) argues that without a philosophical assumption, there is no direction and guidance for the research. In qualitative research, there are three main types of philosophical assumptions namely, Ontology, Epistemology and Axiology. Axiology is the combination of Ontology and Epistemology. Each of them significantly represents different aspects of philosophy. These philosophies are considered as assumptions in research.

Ontology is defined as the investigation of many realities that exist and are available for everyone to learn from (Al-Ababneh, 2020; Rooney, 2013). Ataro (2020) and Hathcoat et al. (2019) state that ontology is making assumptions of the realities that exist in nature, which is defined as the study of existence. Rawnsley (1998) states that ontology is the affirmation of the relationship of what nature provides to life. The discovery of what is true or false is done through ontology (Brown, 2017). Ontology seeks to understand the relationship of things to create an image that all existing things are connected (Rooney, 2013). The most common use of ontology is defining relationships and connections to create representations that could be used to describe the existence of interrelations (Huang, 2010). In research, two ontological stances exist: objectivism and subjectivism. The ontological stance for this research is subjective. Subjectivism is defined as being biased, based on the understanding one has from observations of occurrences in data collected (Bennett, 2017).

In this study, RPA exists ontologically through the reality that people understand differently how it is used in financial institutions. However, how RPA exists in financial institutions is not known, and why organisations select RPA is not empirically known. As a result, this research aims to understand how RPA is selected and what the implications of using and adopting RPA in financial institutions are.

Epistemology is defined as the investigation of the world of understanding (Al-Ababneh, 2020). Ataro (2020) states that Epistemology is the observation of what is known and how what is known gets used by people. This is to test how much knowledge the researcher has acquired through the

study to underpin a phenomenon at hand (Brown, 2017). Epistemology is the researcher understanding and differentiating between what is data and what is information to gain knowledge in their study (Rooney, 2013). Al-Ababneh (2020) states that knowledge enlightens, and through knowledge a researcher gains more understanding. Singh (2017) argues that to understand Epistemology, the researcher needs to understand the theory and obtain knowledge of understanding. In research two epistemological stances exist which are positivism and interpretivism. The epistemological stance for this research is the interpretivist approach. Interpretivism is defined as the understanding based on the experience between humans and the subject (Goldkuhl, 2012).

Epistemologically, the study examines what can be learnt about the use of RPA in financial institutions: How RPA is selected and implemented and why RPA is selected and used in financial institutions in developing countries, such as South Africa (SA). This study seeks to understand the factors that influence the adoption of RPA in the context of financial institutions in SA. It is to examine the current adoption of RPA for developing a model that can guide the adoption of RPA in financial institutions in SA.

3.3 RESEARCH APPROACH

The research approach is also known as the approach to theory, which seeks to describe why the research problem exists. A research approach is a plan used to guide the study for collecting, analysing, and interpreting data. In research, there are three methods of reasoning, namely, inductive, deductive, and abductive. The research approach applied in this study is inductive reasoning. Inductive reasoning is mostly applied in studies where the answer can never be a simple yes or no but rather requires reasoning to create themes and patterns (Behfar & Okhuysen, 2018). However, Deductive reasoning is applied through observations to understand the phenomena at hand (Flach & Kakas, 2000). Abductive reasoning is observations done incompletely to predict whether something is most likely to be true or false (Pauwels, De Meyer & Van Campenhout, 2013).

Deductive reasoning assumes that if an answer is true, then that is the final answer without any debate or tests (Mitchell & Education, 2018). Abductive reasoning declares that untested theories and assumptions could be right or wrong (Ganesan et al.,2019). Mitchell and Education (2018) state that abductive reasoning uses what is known to create test cases, where the researcher reasons with the acquired information to conclude with a hypothesis that has not been tested. Inductive reasoning is applied in information systems to understand different perspectives of the phenomena. McAbee, Landis and Burke (2017) state that inductive reasoning can assess how big data can be useful and add value to organisations.

This study applied inductive reasoning to obtain data and encode it according to the knowledge of RPA acquired. Furthermore, Wolski and Gomolińska (2020) argue that not only can inductive reasoning be used on big data, but it can also be used for obtaining meaning and knowledge from the data. Inductive research can be used in information systems to understand the functions of socio-technical information systems (Beese et al., 2019). Riordan et al. (2017) mention that inductive reasoning can also be applied when conducting a study that seeks to understand the learning approach to an information systems course.

Based on the aim of the study, which was to propose a solution through a model that can guide the adoption of RPA in financial institutions in SA, an inductive approach was followed. The inductive approach was followed because of the aim of developing a theory and, in this case, (of study) the model is the theory that will be developed. The theory (model) can be used by any financial institution that is willing to adopt RPA. The TAM was used as a lens to understand the adoption of Robotic Process Automation in financial institutions in South Africa.

3.4 RESEARCH METHODS

A research method guides the way a study is conducted. In research, there are two methods namely, qualitative and quantitative. The combination of qualitative and quantitative is mixed methods. Selecting a research method is dependent on the aims and objectives of a study. For this study, the qualitative research method was applied. The qualitative research method is referred to as 'first-hand' inspection (Queirós et al., 2017). Bansal et al. (2018) state that the qualitative method allows the researcher to draw conclusions based on observations through interviews and direct contact with participants.

Quantitative research allows for analysis through numerical representation (Basias & Pollalis, 2018). Baldwin (2018) argues that for a qualitative study to have rich insightful data, the researcher must directly obtain data and not rely on data that was collected by other people. The quantitative research method is the analysis of data through numerical representations (Goertzen, 2017). Khaldi (2017) states that the qualitative research method seeks to find a relationship between the data and research questions to draw an understanding of the research objective, whilst quantitative is to answer how many agree or disagree with the statements, and mixed method is a combination of the qualitative and quantitative research methods.

The qualitative research method is used in information systems for various reasons; to determine the potential use of systems, assess the feasibility of health information systems, examine fundamentals of big data, and assessing the use of artificial intelligence according to different age groups (Abbasi et al, 2016; Moucheraud et al., 2017; McKenna et al.,2017; Yang & Siau, 2018).

Kaplan and Maxwell (2005) state that the qualitative research method is used in information systems and computer science studies to examine how systems or applications users conduct themselves in using a technology. However, Boddy (2016) argues that qualitative researchers are known to not have a bias in deciding on the sample size. Moser and Korstjens (2018) state that sampling in qualitative research requires the researcher to collect data until they have reached a point of saturation. A point of saturation is defined as a point where there is a repetition of the same data and there is no longer new data being obtained (Saunders et al., 2018).

This research uses the qualitative research method to gain first-hand experience with the data to observe, question how, what, when, and who, to find a relationship with the data and the research objectives. Therefore, qualitative research approach assists to draw conclusions based on observations through interviews and direct contact with participants.

3.5 RESEARCH DESIGN

To achieve its aim, every research requires a design that will guide the way it is conducted. The design combines all the research elements to provide an oversight and solution to the problem(s) and analyse all the data collected. Four types of research design exist in qualitative research namely, ethnography, grounded theory, phenomenology, and case study (Astalin, 2013). In this study, the case study approach was selected as the design. A case can be identified as an organisation or a subject matter at hand (Ridder, 2017). A case study is a thorough investigation of a problem through acquiring hands-on experience with the case. A case study can be defined as a research design that focuses on a particular instance to collect information that can be utilised in other instances of the same phenomenon (Gerring, 2004). Tellis (1997) states that a case study is conducted through focusing on one instance to observe and analyse the instance guided by the objectives of the study.

There are two different types of case study in research, namely single or multiple case studies. A single case study is when a researcher focuses primarily on one case without having to compare the case to another, whereas multiple case studies is the study of various cases to identify any anomalies or resemblance between the cases being studied (Gustafsson, 2017). Verner et al., (2009) argue that a single case study is appropriate when conducting an exploratory study that does not require any comparisons. Wells et al., (2012) state that a case study can be applied in various ways such as documentation, focus groups and through interviews.

A case study research design was selected to primarily focus on one financial institution in South Africa as a case. Pacho (2015) states that the main advantage of a case study research design is that the researcher can underpin one instance or subject matter at hand extensively to achieve the

desired aim of the study. Zainal (2007) declares that a case study research design allows the researcher to thoroughly inspect a subject matter and to understand it through inquiry and exploration.

A single case study was adopted that focuses on one financial institution. For ethical reasons, the selected financial institution is referred to as Misuzulu Bank. This is a pseudo name and not the organisation's real name. The criteria selecting one financial institution are access to the institution and due to the institution currently using RPA as part of its technology initiatives. South Africa has five big banks referred to as the big five; one bank representation for all South African financial institutions is sufficient, as all banks have the same regulations, culture, and environment (Coetzee, 2018).

3.6 DATA COLLECTION

Data collection is the process of collecting, analysing and measuring data. Without data, research is not complete and traceable. There are different types of techniques that can be used to collect data in qualitative research. Some of the techniques are direct observation, standardised versus investigator-developed instruments, standardised tests, standardised personality inventories, summated attitude scales, questionnaires, and interviews (Morgan & Harmon, 2001). For this study, interviews were conducted. Barrett and Twycross (2018) state that data collected through interviews is a qualitative study element. There are three types of interviews in research: structured, semi-structured and unstructured interviews. This research collected data using semi-structured interviews.

Structured interviews are governed by the questions being posed to the respondent which are arranged prior to the interview and are fixed with no open-ended questions that allow follow ups (Gill et al., 2008). Queirós, Faria and Almeida (2017) state that structured interviews are coordinated by the researcher who is the leader and the driver of the conversation, based on the planned questions. Young et al. (2018) also state that in structured interviews the respondent can never alter the questions posed during the interview as the researcher is the only driver that directs the conversation. Structured interviews include a series of close-ended questions which have constructed, prearranged answers such yes or no (Wethington & McDarby, 2015).

Semi-structured interviews are the most used type of interviews in research studies because of how they allow researchers to explore open-ended questions and different views from the respondents (Adhabi & Anozie, 2017; Evans & Lewis, 2018). Roulston and Choi (2018) argue that semi-structured interviews are mostly chosen by researchers, as the questionnaire can be “free-swinging”, allowing the researcher to add onto the structured questions during the interview. Adhabi

and Anozie (2017) state that semi-structured interviews rely on how the respondent responds to the questions administered by the researcher. Finkbeiner (2017) also alludes that semi-structured interview allow the respondents and the researcher to have a conversation outside the outlined questions for the interview.

Unstructured interviews are preferred by researchers that want a conversation that allows respondents to have freedom of speech without being governed by questions (Zhang et al.,2018). However, unstructured interviews are mostly directed towards the researcher's interest and objectives (Adhabi & Anozie, 2017). In Unstructured interviews, the potential questions and answers are not arranged in advance since the conversation is dependent on the interaction between the researcher and the respondent (Zhang & Wildemuth, 2009). Wilson (2011) states that unstructured interviews allow the researcher to brainstorm all potential approaches that the interview should follow whilst being openminded about the conversation.

Semi-structured interviews were selected as the data collection technique for this research, as they allow room for details and open-ended questions. The objectives of the research were to understand the factors that influence the adoption of RPA in the context of financial institutions in South Africa. Open ended questions drive meaningful conversations with the respondents until the research reaches a point of saturation.

i. Criteria for the selection of participants:

Participants were selected from both the IT and business units involved with the RPA solution in the organization. The criteria used in the selection of the participants are stated as follows:

- Spent at least one and a half years in the organisation, to ensure that they know the business as well as the goals and objectives of the organisation.
- Participants familiar with RPA for at least one and a half years with knowledge and understanding of the technology.
- A total of 12 participants were interviewed: six from the IT unit and six from the business unit.
- The 12 participants were interviewed, and the researcher reached a point of saturation from the interviewed participants.

ii. Demographics:

As shown in Table 1, the demographics of the participant are three categories: senior managers, RPA software developers, and users.

TABLE 1: DEMOGRAPHICS OF PARTICIPANTS

| Position | Unit | Years of service |
|----------------|-------------|----------------------|
| Senior manager | IT/Business | Minimum of 1-5 years |
| RPA Developer | IT | Minimum of 1-5 years |
| Users | IT/Business | Minimum of 1-5 years |

Demographics are classifications of a group of people in a specific context or for a task (Kärkkäinen, 2016). The demographics for this study as shown in Table 1 above were selected based on factors determined by the researcher for the participants, which are the position, unit, and years of service. This was to ensure that the research selection criteria were met, and different positions and units were considered when selecting the participants.

3.7 DATA ANALYSIS

Data analysis is the process of coding and cleaning useful information obtained through various techniques, such as documentation, interviews, observations, surveys, and focus groups. Data analysis is the process of data interpretation to give useful meaning to the data. In this process, TAM was used to guide the analysis. TAM was holistically covered in the previous chapter.

The data was coded to identify different participants' interview transcripts. Coding is defined as discovering meaningful words and sentences which convey the same message and labelling them with codes (Belotto, 2018). The coding of words and sentences created themes which were interpreted from the segments of transcripts which led to the identification of themes.

Data cleaning is the process of grouping collected data into themes to make sense and meaning of the data (Kundu & Sharma, 2020). Using TAM, the themes are grouped by identifying the perceived usefulness, perceived ease of use, attitude towards using the technology and actual system use. The overview of TAM shown in Table 2 below has four main aspects applied in this study as follows:

TABLE 2: TAM COMPONENTS

| TAM components | Definition |
|----------------------|---|
| Perceived usefulness | The degree to which the employees perceive RPA to be useful in enhancing productivity and process efficiency. |

| | |
|---------------------------------------|---|
| Perceived ease of use | The degree to which the employees rate RPA as easy to use and free from effort. |
| Attitude towards using the technology | The feeling or impression employees have towards using RPA. |
| Actual system use | The use of RPA in the organisation. |

3.8 UNIT OF ANALYSIS

A unit of analysis is based on who or what is being analysed for the study. For this study, two units were used for analysis, which are IT and business within the organisation. RPA is not used by only technology people; RPA is used by both business and IT. Data is collected at different levels. Some are managers (IT and Business) involved in the RPA processes, developers, and users. RPA is used by all users in the organisation, from IT individuals who are involved in developing, solutioning and implementing processes to business individuals who are involved in the planning and monitoring of processes.

3.9 CONCLUSION

The purpose of the research methodology chapter was to outline the methodology followed to get an in-depth understanding of the use of RPA in the context of financial institutions in South Africa. This qualitative research made use of inductive reasoning to observe and create patterns, applying an interpretivist viewpoint to understand the relationship between the employees and RPA. Data was collected, using semi-structured interviews and TAM was used as a lens for the data analysis.

CHAPTER 4: OVERVIEW OF CASE

4.1 INTRODUCTION

As explained in chapters 1 and 3, the study employs the case study approach in its design. This means that an organization that meets the criteria to participate in the study was used as a case. Subsequently, data was collected from the organization. This chapter presents an overview of the case, organization that was selected for this study. It is important to provide useful information about the organization. However, the identity of the organization anonymous, therefore, a pseudo name "Misuzulu bank" is assigned to the organization.

This chapter is divided into 3 main sections. In the first section, fieldwork is explained. This is followed by the case overview of Misuzulu bank. In addition to the information about the organization, the chapter provides a discussion on how the fieldwork was conducted in the organisation. Finally, a conclusion about the chapter is drawn in the last section.

4.2 FIELDWORK

The data was collected from one of the South African major banks (Misuzulu bank), the researcher obtained ethical clearance from the university to collect data to understand the adoption of robotics process automation (RPA) in financial institutions in South Africa. Furthermore, approval to interview employees within the organization with knowledge of RPA was obtained from the organization's internal compliance and risk department. Semi structured interviews were conducted to collect data from the participants, a total of twelve participants participated in the study. Six of the participants were from the business departments and six were from the information technology (IT) department. A point of saturation was reached at twelve participants, a point of saturation in qualitative studies is defined as the point or extremity where the researcher obtains the same information from the participants (Saunders et al, 2018).

The interviews were conducted using the Zoom application platform which was chosen as a preferred interviewing tool because access to the platform is free, easy to use and was granted by the internal compliance and risk department in Misuzulu bank. The selected participants had to have the Zoom application installed on their personal devices as instructed by the internal compliance and risk department to protect the organization from any security breaches and data leakages. The maximum length of all interviews was 30 minutes, this was considered a fair amount of time per interview to collect data during working hours and not inconvenience any employees on their daily operations. All data collected was stored in an encrypted location in the cloud that can only be accessed by the researcher and the supervisor for the study.

Obtaining access to any banking institutions in the South African financial sector is considered difficult as the environment is diligent. However, the researcher was an internal employee of the selected banking institution. Therefore, the researcher was able to reach out to the case's internal compliance department to seek approval to conduct interviews for data collection. To obtain approval to conduct interviews, the organization requested a copy of the interview questions to understand the type of questions that will be posed at the participants. This was done to check if the research questions do not cause any harm or hate of speech to the organization.

4.3 CASE OVERVIEW

The Misuzulu bank (Pseudo name) is one of the South African major banks. The Misuzulu bank was formed over 3 decades ago and as of the time of this study, the bank has over 60000 employees including contract and permanent staff. The selected bank is a diversified African financial institution which provides products and services in many African countries such as Botswana, Ghana, Kenya, Mauritius, Mozambique, Seychelles, South Africa, Tanzania, Uganda, and Zambia. The Misuzulu bank offers services ranging from savings plan, notice deposits, mortgage loans, car financing, retirement, annuity etc. The selected South African bank has branches in major cities in South Africa including Johannesburg, Cape Town, Durban, Port Elizabeth, East London, and Bloemfontein.

The headquarters of Misuzulu bank are in Johannesburg and this study was conducted in the headquarters in South Africa. The organization is structured into five main divisions: wealth and insurance management, retail banking, corporate and investment banking, global banking, and private banking. The Data was collected from all five main divisions IT department. The IT department has an RPA unit which is responsible for all RPA initiatives. The use of RPA affects and impacts all the five main divisions listed above as the technology is adopted by all divisions in bank. The RPA unit is one of the fast-growing innovative units in the IT department. The organogram of the Misuzulu bank IT department is as follows:

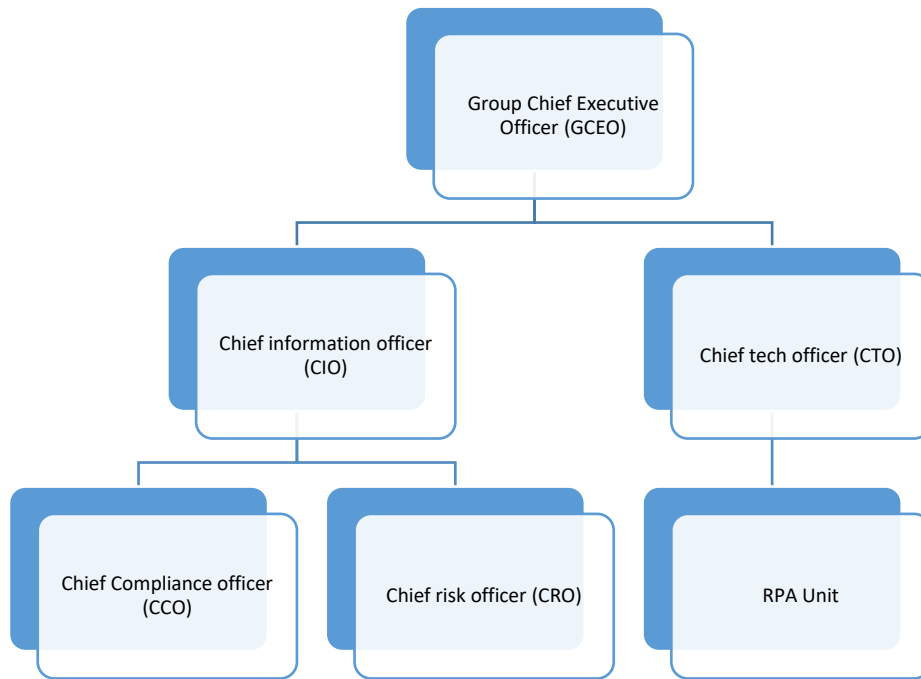


FIGURE 4.1: IT DEPARTMENT ORGANOGRAM

The IT department is one of the largest departments in Misuzulu bank with over 1000 IT specialists across all countries where Misuzulu bank is situated and over 500 of the IT specialists are situated in the headquarters in Johannesburg. These specialists range from Software engineers, IT project managers, web developers, RPA developers, Machine learning specialists, system administrators, business analysts, data analysts, database administrators, operations management, network engineers, data architects, network administrators, systems analysts, and systems engineers. The IT department is one of the core drivers of business processes which is responsible for ensuring that the organizations hardware, software, networking, and architecture is always competent and swift for all banking operations.

The IT department works as a team, however, there are different units within the IT department that are streamlined into seven functional units; (1) IT service desk, (2) IT Administration, (3) IT project management, (4) IT Operations, (5) System infrastructure and integration, (6) Information security and (7) RPA unit. Each functional unit has different responsibilities and plays a huge role in the IT department. The IT service desk (1) consists of about 50 people, each of these 50 people are responsible for different tasks such as managing software's installed in computers, configuration of computers and troubleshooting. Some of their responsibilities are managing software that are installed users' computers, this means that they configure it, they ensure that the versions of the software are in alignment with the organization or the IT department standard. To

ensure that all applications installed on all computers are operating as intended and does not cause any harm or expose the bank into security or data leakage incidents. The way that they provide their support is both onsite and online. The head of the IT service desk reports directly to the CIO.

The IT administration unit (2) consists of over 50 people, each of these 50 people are responsible and oversee the purchasing of Misuzulu's new technologies. This means that when the bank wants to start using a new technology the unit does the research on that technology on the market to find out the costs, setup and completes service level agreements (SLA) with the third parties that offer those technologies. The unit is also responsible for the integration of any new technologies, this means that the new technologies are incorporated into the bank and are introduced to all units for actual use. The unit receives their requests from only management and the head of the IT administration reports directly to the CIO.

All IT projects are overseen by the IT project management unit (3) which consists of over 100 people who are responsible and ensure that all IT projects with Misuzulu bank are planned, coordinated, and integrated. This means that the team oversees the life cycle of an IT project from planning, conception, testing, launching, monitoring, and reporting. The unit is also responsible for problem solving during the projects, communication between the team, setting and remaining within the project budget, communicating the deadlines, setting milestones, identifying the risks, and controlling the overall project cycle. The head of IT project management reports directly to the CIO.

The Misuzulu bank IT projects cannot be a success without the IT operations unit (4) which consists of over 100 people, each of these 100 people are responsible for managing Misuzulu computer hardware and software. The primary role of the operations team is to monitor the organizations servers in the server rooms, management of the network which ensures that the networking in all buildings is configured correctly, ensuring that all computer hardware is the correct hardware for the employee's roles and responsibilities to manage and monitor any irregularities and performance issues with the hardware and software. The operations team is responsible for setup of any hardware within the bank. The head of IT operations reports directly to the CIO.

The system infrastructure and integration unit (5) are responsible in enabling the delivery of banking services and solutions to the customers. The system infrastructure and integration unit consist of over 200 people. Each of these 200 people is responsible for how the data flows, stored, processed, and analysed by the organization. The bank has multiple data centres across different countries to ensure that there is backup and continuity of daily banking operations. The primary role of the system infrastructure and integration unit is to ensure that all customer data is secure, all applications and systems used in the bank are efficient and stored securely. The system

infrastructure and integration unit are critical to the bank because of their role to ensure business continuity of the banks daily operations. The head of system infrastructure and integration unit reports directly to the CIO.

The information security unit (6) consists of over 50 people, each of these 50 people are responsible and oversee the safety of processes and tools deployed in the bank. This means that the unit is responsible for ensuring that no data breaches occur in the banking environment and only authorized individuals have access to the banking systems information. The information security unit's primary role is to protect Misuzulu banks information from being modified, disrupted, destructed, and inspected by individuals outside the bank or not authorized to have access to the information. The information kept within the organization is sensitive information and therefore should remain safe and secure from unauthorized individuals. The head of the information security unit reports directly to the CIO.

The RPA unit (7) which is primary focus of this study consists of over 50 people, each of these 50 people are responsible for identifying processes, developing, testing, implementation, and monitoring of automated processes. This means that the unit is responsible for identifying any processes within the business units that can be automated, once the processes have been identified the team conducts walkthroughs to understand the process steps and the overall task carried out by the employees. The team, therefore, develops, tests, implements, and monitors all automated processes in the bank. The team develops all automation projects using their own inhouse developed tool. Since the RPA unit is a recent innovative unit in the bank, the head of RPA reports directly to the CTO.

The RPA unit is one of the most recent founded units within the bank with just over 5 years in the IT department. The RPA unit team has different skills ranging from RPA developers, business analysts and project managers. The employees in the RPA unit are placed in different business units, this decision was made based on the aim of spreading the use of RPA within the organization. The reasoning was that RPA employees can be exposed to day-to-day operations and identify processes that can be automated using RPA. The chosen use cases for automation are based on cost saving, efficiency, and production factors. The RPA unit is responsible for the full life cycle of all automation projects, from process identification, process mapping, developing the robots, testing the robots, implementation of the robots and monitoring of all robots in the production environment.

The employees in the RPA unit are part of the Robotics team, the RPA unit forms part of the information technology (IT) department. The focus of this study is on the use of RPA technology and therefore, the primary unit within the IT department was the RPA unit. The IT department is

responsible for managing and introducing new technologies such as RPA into the bank with the aim of enhancing production accurately and efficient. The RPA unit aims to automate most banking processes that are correct use cases for the use of RPA. The IT department is the core of all banking operations, the department is responsible for all technological aspects of the bank such as onboarding of employees and customers in banking applications and systems, day to day banking operations, infrastructure and hardware, storage of data, core banking systems and applications and all technological devices used by the employees.

The Misuzulu bank has different business units which offer different services based on the customer types. All different business units are responsible for ensuring that the bank is operating efficiently, accurately and generating revenue for Misuzulu bank. There are different business specialists within the bank ranging from Internal auditors, insurance brokers, bank tellers, service advisors, financial advisors, fraud specialists, and risk personals. There are five business units in Misuzulu bank namely, (1) wealth and insurance management, (2) retail banking, (3) corporate and investment banking, (4) global banking, and (5) private banking.

The Wealth and insurance management (1) consists of over 100 people, each of these 100 people are responsible for managing customers wealth, assets, financial planning and ensuring that customers have insurance for their assets. This means that the unit offers advisory to the customers on their investments, retirement packages, estate planning, accounting services and insurance available for their assets. This unit tailors personalized wealth and insurance advisory services for each customer based on their wants and different scenarios. Wealth and insurance management is only offered by the bank to their affluent customers. The team is therefore assigned to different customers for private banking and advisory. The head of the Wealth and insurance management unit reports directly to the GCEO.

The Retail banking unit (2) is the biggest unit within the bank and consists of over 4000 people, each of these 4000 people are responsible for the day-to-day banking activities that banks are known for which includes offerings in physical bank branches such as card collections, cash deposits, enquiries and advisory. This means that employees in the retail banking units are mostly situated in physical bank branches and bank call centres. Their primary role is to aid on all general banking activities and services to local communities, the branches are to have physical banking and be the face of the bank to meet customers personally and interact to offer various services. Most of the employees in the bank are situated in bank branches and Misuzulu bank has over 1000 branches across different countries. The head of the Retail banking unit reports directly to the GCEO.

The Corporate and investment banking (3) consists of over 100 people, each of these 100 people are responsible for the customers business banking needs which includes small, medium, and large businesses. This means that this unit is responsible for all business banking needs and requirements which include opening of new business banking accounts, funding of businesses, business loans, providing financial advice, corporate trading affiliations, handling of mergers and acquisitions as well as acquiring and maintenance of stock. Their primary role is to ensure that business day to day banking needs is fulfilled and all short- or long-term business goals are achieved. This includes, corporate lending, global markets, commercial property finance, trading, and transaction banking. The head of Corporate and investment banking unit reports directly to the GCEO.

The Global banking unit (4) consists of over 100 people, each of these 100 people are responsible for the cross-border banking transactions and activities that includes managing of foreign currency services and accounts. This unit is primary responsible for providing financial services and products worldwide. The unit specializes in cross-border banking operations such as Liquidity management, transborder advisory and multi-currency services. The Global banking unit ensures the successful cross-border banking operations between domestic and overseas customers. The head of the global banking unit reports directly to the GCEO.

The last business unit is the Private banking unit (5) which consist of over 100 people, each of these 100 people are responsible for providing customized individual banking services for high-net-worth individuals. In South Africa, a high-net-worth individual is defined as an individual with a net worth or sizable assets of R7 million or more (Koning & Harbor, 2013). The primary responsibility of the private banking unit is to offer wealth management services for the customers including everyday transactional banking, cash management services, retirement products, credit and asset management, tax planning and insurance. The head of the private banking unit reports directly to the GCEO.

RPA is beneficial to the bank in automating tedious repetitive tasks that are prone to human error and are of high volumes such as the process of onboarding of customers, application of vehicle finance, processing of payments, month end reporting etc. The Misuzulu bank RPA division automates different processes from all five main divisions. The RPA technology was introduced in Misuzulu bank for over 6 years ago. The bank adopted the use of RPA using third-party tools for automation of processes. The bank selected one of the third-party tools offered in the market for automating processes. However, the bank later decided to develop their own internal automation to decrease costs of purchasing third party licensing. The bank has since been using their internal automation tool and has produced more than 500 robots in the production environment.

4.4 CONCLUSION

The purpose of the case overview chapter was to outline how fieldwork was carried and the overview of the selected case. To get an in-depth understanding of how access to the organization was obtained, the use of semi-structured interviews and how the organization is structured. The structure and organization organogram shows where the RPA unit is located within the organization and the role that RPA has in all business units within the bank. Semi-structured interviews were conducted in headquarters of Misuzulu bank in South Africa. A total of twelve interviews were conducted, six from the business units and 6 from the IT department. The next chapter presents the analysis of the data, which was conducted using the technology acceptance model as a lens.

CHAPTER 5: DATA ANALYSIS AND INTERPRETATION

5.1 INTRODUCTION

This chapter presents the analysis of the data collected using the semi-structured interview technique. Technology acceptance model (TAM) was applied in the analysis. Both TAM and the semi-structured interview technique are discussed in detail in chapters two and three, respectively. The analysis is aimed at achieving the objectives of the study, as stated in Chapter 1 and revisited in Chapter 3.

For ease of logical flow and understanding, the chapter is structured into four sections. The first section introduces the chapter. In the second section, an overview of the analysis is provided. This is followed by the data analysis. At the end, a conclusion about the chapter is drawn.

5.2 OVERVIEW OF DATA ANALYSIS

The objectives of this study are: (1) to gain an understanding of the factors that influence the adoption of RPA in the context of financial institutions in South Africa; and (2) to establish the requirements for the adoption of the RPA as a solution for financial institutions in South Africa. In achieving these objectives, a South African financial institution is used as a case study. This means that data was collected from the organisation with specific focus on why RPA is deployed; how the technology is deployed; and the implications of the deployment.

Following the interpretivist approach, the analysis was conducted using TAM as a lens. The interpretivist approach seeks to understand the relationship of people to the subject matter which, for this study, aims to understand the adoption of RPA. The approach is introduced in Chapter 1 and discussed in Chapter 3. This includes the rationale for selecting the approach. TAM considers different variables to assess how users adopt and use a particular technology (Davis, 1993). The model was created around the users' motivation on why and how they perceive it to be useful and easy to use (Davis, 1985). As shown in Figure 1.2 above, TAM consists of four main dominant variables: (1) Perceived usefulness (PU); (2) Perceived ease of use (PEOU); (3) Attitude toward using (ATU); and 4) Actual system use (ASU).

TAM considers the perception of the people and how people perceive a technology to be easy or useful. Pseudo names were assigned to avoid the disclosure of the identities of the organisation and those that participated in the study. For ease of reference to the data gathered from participants, the pseudo names were used to create code names: MZP01 – MZP12; each document (interviews transcribed) was formatted by giving page and line numbers ease of reading

and referencing. For example, MZP01, 23:20 means an extract from participant number 1, page 23, and line number 20 of the transcript from the participant.

5.3 DATA ANALYSIS

As presented in this section, the analysis is conducted along the line of the four variables in Figure 1.2, PU; PEOU; ATU; and ASU. Primarily, this is to gain deeper insights from two perspectives; the factors that influence the adoption of RPA in the context of financial institutions; and establish the requirements for the adoption of the RPA as a solution for financial institutions in South Africa.

5.3.1 Perceived usefulness

Perceived usefulness is a thought that a particular technology is significant and can help carry out certain tasks in an environment (Lai, 2017). It is based on this perception that Misuzulu bank deployed the RPA technology. Although the technology is deployed in the organisation, the perception is not holistic, meaning, not all employees from both information technology (IT) and business share the same view and opinion.

From the IT perspective, different specialists were involved in deploying and using the RPA in Misuzulu bank. Some of the specialists are data analysts, software developers and IT managers. From the business perspective, different business units were involved in the study, ranging from internal audit, risk management, business operations to corporate and investment banking, retail banking, and day-to-day banking operations. The perceptions of these specialists on whether the technology is or can be useful in the activities and processes of the organisation were critical in the consideration for deployment. According to one of the IT specialist participants:

“I think there is just a lot of manual tasks that are repetitive that they have to perform, especially when it comes to the customer for example, ... the process of applying for car finance its repetition of the same thing...” (MZP03,1:37-41).

The perceptions of IT specialists about the deployment of RPA were considered significant in that the IT unit is responsible for the evaluation, implementation, support, and management of the technology within the organisation. The consequences are that the technology must be appropriately implemented and the entire organisation must rely on technology support to purposefully make use of the technology. In addition, management helps to avoid the derailment of the technology.

The questions were, what informed and influenced the perceptions of the IT specialists? Many of the IT specialists in the organisation relied on second-hand information, i.e., information from colleagues and the public. Some IT specialists embarked on a preliminary investigation to understand the purpose of RPA and how it works. These are perceptions because their

understanding is not based on reality or practice. Thus, it was not based on users' experiences and responses to the use of the technology.

However, not all specialists in the IT unit perceived RPA to be useful to the organisation. This is since many of the business systems that the bank is using for its operations, often referred to as legacy systems, are old. The over-reliance on legacy systems impacted the rate at which Misuzulu bank adopts new or emerging technology, which is evident in the adoption of RPA. Consequently, this influences the perception of some IT specialists in adopting, deploying, and using RPA in the organisation. One of the participants alluded as follows:

“Even though we (organisation) are on a journey to transform, which includes deploying newer and emerging technologies, we still rely on legacy systems”
(MZP03,1:32-35).

A perception from some quarters of the IT unit suggested that RPA can easily integrate with legacy systems. This perception was due to a lack of readiness assessment. As a result, there was slowness in the operationalisation of the RPA, leading to the duplication of processes. For RPA to work efficiently, accurately, and reap the benefits of the technology, stable application systems and environments are required. This requires readiness assessment to ensure RPA operates and fulfils the purposes of its deployment. For instance, another participant stated that:

“Some systems are always offline, then it becomes difficult for us to work”
(MZP10,2:83-85).

The business users in Misuzulu bank perceived RPA differently from how many of the IT specialists did. The perceptions of many of these users were based on the possibility of having a stable platform and smooth operations. This perception was primarily based on their concentration and experiences with the current systems, which were sometimes challenging to use. Thus, many participants perceive RPA as useful, and others differ due to the unstable environment and lack of readiness of most application systems to integrate with the technology.

The perception of businesspeople about the deployment of RPA was important to understand how RPA has affected or impacted their day-to-day business operations. This includes the perception of how RPA can possibly assist or derail their work activities. Rather than readiness assessment, this individual evaluation was based on 'hearsay' on how RPA has made a difference to the processes and activities in some areas. One of the participants with the business unit stated as follows:

“It’s exciting that technologies such as RPA exist, speaking of where I am in my career, I have a lot of tedious tasks that take a lot of time, and RPA can be used to automate those tedious tasks” (MZP04, 1:20-22).

Many employees in the business unit believe that RPA can assist in processing mundane tasks and processes that do not require human creativity. Thus, many of the employees are sceptical of RPA usefulness for those that perform mundane tasks repetitively. The fears are understood because RPA can replicate tasks end-to-end. By implication, there is no need for humans to perform those processes anymore.

Another fearful aspect is its ability to easily replicate rule-based tasks, which leaves some of the employees idle and threatens their job security. This is not completely the case if employees understand the function of RPA because the technology does not execute itself. It needs humans to integrate the current process with RPA. This integration requires a specific type of skill capacity. At the time of this study, such capacity for change was limited. The change assisted in the process of transformation from the legacy systems to a more dynamic environment that flexibly accommodates newer technologies such as RPA. In brief, one of the participants shared their view as follows:

“Not everyone wants to learn about new technologies such as RPA, so as much as we say people must reskill, not everyone is happy and eager to learn” (MZP02,2:72 - 74).

One of the questions that arise due to unwillingness to learn is, what do we do with employees that do not want to upskill? The rise of technology adoption in the banking environment is high due to the competitive market in the banking sector, leading to technologies such as RPA taking over most processes and activities while replacing human capabilities. However, there are concerns around the management not prioritising the training or upskilling of employees on new technologies such as RPA. One of the participants stated that:

“...there is not much effort in terms of spreading the awareness of RPA”
(MZP12,7:304 - 305).

In Misuzulu Bank, there is a contradiction between the IT specialists and business people’s views. The IT department is promoting the use of RPA and have seen what RPA can do for the bank in terms of productivity, efficiency, and accuracy with mundane tasks and processes within the bank. However, the business people fear the capabilities that RPA has in easily replicating processes with little or no human intervention.

5.3.2 Perceived ease of use

The perceived ease of use is based on users' perception that technology is user-friendly and easy to use (Taherdoost, 2018). Based on ease of use, the study seeks to understand how employees at Misuzulu Bank perceive RPA to be easy to use or not. The perception that RPA is easy to use can be associated with three fundamentals: (1) there are no factors to determine whether RPA is easy to use or not; and (2) ease of use is influenced by individual or group understanding, and (3) RPA's ease of use means different things to IT and business employees in the organisation.

RPA is deployed in Misuzulu Bank, and there is a unit within the IT department of the organisation that focuses on the deployment, management, and use of the solution. RPA was adopted within the bank for mundane tasks and customer data that require swift and accurate processing. However, there are no factors within the bank that can determine whether RPA is easy to use or not. This is because there is no clear mandate and structure from management on how the RPA unit works with business units to create RPA processes. The business units and the RPA unit operate in silos, and there are no uniform factors that can be used to determine whether the use of RPA is easy or not.

Different views exist about the deployment and use of RPA in the organisation. The most prevalent views are categorised into two groups, namely IT and business. The IT specialists find using RPA easy primarily because less coding is required in the use of the solution to automate processes. The use of RPA in the IT department was influenced by the bank's adoption of emerging technologies to enhance the processing speed and accuracy of processes. This led to the bank adopting RPA and upskilling and hiring employees to join the RPA unit. However, the narrative is different from the business side, as no formal introduction and assessment were made on RPA, and, therefore, the business units' understanding of RPA was based on individual research or influence from other colleagues who know RPA.

Some IT specialists were familiar with RPA before and during its implementation in the organisation. Their familiarity with the technology made some of them perceive it to be easy to use, which was not necessarily the case. This is because familiarity and applicability with a technology have proven to be different in nature and practice. According to Azma et al. (2016), the ease of use and application of technology varies according to the old and new generations. Also, ease of use of RPA to an IT specialist is not necessarily the same view or perception of the business counterpart. The perception of IT and business people about the use of RPA was crucial in understanding the influence and the value that RPA has on banking activities and processes. One of the IT specialists stated that:

“If you have a background in IT, then using RPA and understanding the RPA logic would be easy. However, if one does not have a background in IT, then it becomes difficult to use and understand” (MZP09,1:31).

The perception of IT specialists was significant in understanding how RPA is perceived by people who are first in line to be introduced to new technologies in the organisation. The IT people are the first to upskill on new technology for ease of understanding and use when transferring the knowledge to other business units. When IT people perceive the use of RPA negatively, it impacts the use of the technology within the organisation. However, if the IT people perceive the use of RPA positively and easy to use, then transferring the knowledge to other business units will be swift. One of the IT specialists alluded that:

“The way that the RPA tool is structured the user interface is very user-friendly; you don’t need to know everything about it, you just need to know enough to go around and play with it” (MZP05,2:73 – 75).

The perception of ease of use is not uniform amongst IT people. This is attributed to the fact that some IT specialists feel that for RPA to be easy to use, the users must have a solid coding (programming) background. This view is based on the argument that understanding the logic and flow of an RPA process makes the technology easy to use. An IT specialist explained briefly as follow:

“I can’t say it’s easy to use RPA in the organisation. Truly speaking, from my experience, the technology is challenging to use for our operations (MZP08,2:78).

Some IT specialists are concerned about individuals who do not have a coding background. For ease of use, some IT specialists suggested third party RPA tools that do not require much coding skills but allow for drag and drop activities, such as UiPath and Blue Prism. This enables ease of automation of processes by people (employees) who do not have coding backgrounds. As at the time of this study, the RPA department in Misuzulu Bank does not allow using third-party tools because they were considered expensive. One of the IT specialists stressed this:

“The RPA third party solutions are actually expensive, they require licenses, and the organisation is not prepared to invest in them” (MZP10,4:177 - 178).

The ease of use was expressed differently by all IT specialists, and their views were not in harmony with each other as their perspectives of the ease of using RPA differed. Therefore, the study then

seeks to understand how business people feel about using RPA for their day-to-day activities and processes.

The automated solutions and processes are business processes that are conducted and primarily dependent on business departments as they design, implement, and monitor the business processes. However, some employees of business units were well knowledgeable about the organisation's businesses and processes. However, these employees required the knowledge of the RPA "robot" to enable application in the execution of tasks. The RPA developers need the business people to understand the requirements in the application of the technology. One of the challenges is that some of the employees in the business units are sceptical of the word "robots" because it is associated with job losses. This helps to understand how business people perceive the use of RPA to automate their activities and processes. This perspective came from one of the participants who stated that:

"People are a bit scared. They don't know what they don't know, they fear robots because they think it's going to take over their jobs" (MZP06,1:33-35).

The use of RPA for business processes does not require employees of business units to develop the "robots" but to understand how the technology executes to monitor and manage the processes that are handed over for human intervention and escalation. One of the IT specialists alluded to this:

"We train the robot to operate like a person. The robot will know when it encounters an exception and will notify whosoever is responsible for the system" (MZP10,3:103-106).

However, the perception that RPA can be of ease of use did not remove many employees' scepticism that technology is a threat to their job security. Thus, there was the need to emphasise awareness about RPA and its roles in the organisation. This includes the complementarity of humans' functions and RPA role in carrying out the organisation's processes and events for improved efficiency and effectiveness. Consequently, the understanding and awareness are expected to help detect the gaps towards increasing capacity and capability in using RPA and human efforts in the organisation. Also, this can address the perception that some employees' lack awareness in the organisation or simply do not want to learn about the new (RPA) technologies that will disrupt their roles and comfort in executing their current responsibilities, activities, and processes in the bank. Here is what one of the participants said about this:

“I’m not sure what the bank is doing or where they are with RPA initiatives. They’re not getting the information to us (business people) and not transparent enough with the RPA journey thus far” (MZP12,2:60-61).

Based on their perceptions, many employees, particularly those in the business units, had mixed feelings and emotions about the implementation and use of RPA in the organisation. Thus, some business people might not find RPA easy to use due to reluctance in understanding RPA capabilities and not being well informed about RPA functions and roles in the automation of business processes. This was stressed by one of the participants who stated:

“I know that in our bank, there is an RPA division/department, but as an auditor, I have never come across an RPA process or a robot that was of benefit to the bank (MZP01,4:166-168).

While the business people are to blame, so is the management of the organisation in not raising enough awareness and ensuring that everyone in the organisation is kept in the loop and well informed of any new technologies being introduced in the bank and enforcing mandatory training for ease of use and understanding.

5.3.3 Attitude toward use

Attitude is a settled or subtle way of thinking or behaviour towards a subject or object. Thus, the attitude or thoughtfulness, including feelings and emotions, influence the use of new technology (Lai, 2017). Based on these perceptions, this study seeks to understand employees in Misuzulu Bank’s standpoint towards the use of RPA for organisational purposes. The attitude towards the use of RPA is expressed by mixed emotions based on the advantages and disadvantages that are perceived about RPA by individuals and groups. The different views were obtained from both IT and business as both have a role in the implementation and use of RPA.

In the IT department, the attitude towards using RPA was positive, as employees in the IT field were always upskilling and learning about new technologies. However, some employees in the IT department were not impressed with the organisation’s approach and awareness of RPA. From the business perspective, the attitude of some employees toward using RPA was concerning. This was due to fear and panic brought by the new technology (RPA) within the organisation. As a result, this made most employees feel less motivated to learn more and understand the technology. The perception of how IT and business people felt towards the use of RPA was crucial in the study to understand the different viewpoints and feelings of employees. One of the IT specialists expressed their feelings as follows:

“RPA should be easy for anyone to understand, as long as they are part of the planning and solution of processes being automated like the developers so that they can have an overview and see that RPA can assist in mundane tasks” (MZP03,5:219-221).

The attitude of IT specialists towards using RPA was crucial to understanding how they perceive and feel about the adoption of RPA within the bank. The IT department is where the organisation can gauge how most IT specialists feel and react to adopting any technologies being introduced in the bank. Most IT specialists are required to upskill other employees in the organisation on the adoption of a new technology. Therefore, their attitude expressed either by fear, perceptions, or emotions has a big impact on how other employees feel about adopting that technology. However, learning and upskilling is not a challenge to most IT specialists. This was expressed by one of the IT specialists who stated:

“For us who are part of the RPA unit, we are very happy because we got an opportunity to learn a new technology and upskill. In IT, you must be creative and think of something that will make work easier, and RPA has been helpful” (MZP09,3:104-106).

The viewpoints on the use of RPA were not mutual amongst IT specialists as some of the IT specialists feel that RPA is a technology that requires fast networks, laptops, and operating systems to operate at full potential. This viewpoint was because the banking infrastructure was not stable enough. As a result, there was reluctance to change over to new and improved infrastructure due to security and productivity concerns such as downtime of processes which could result in risk events. According to one of the IT specialists:

“The challenges with working in the bank are that one needs to ensure that everything that is captured is accurate. Therefore, all systems should be fast enough to match the capabilities of RPA” (MZP08,1:46-47).

The business people were responsible for monitoring automated processes and ensuring that whenever a system or application was upgraded, the RPA developers were made aware so that they could make the necessary changes to the RPA process flow and logic. The attitude towards using RPA for business people was expressed differently because the use of RPA was not a priority. They were of the attitude that their processes worked regardless of the use of RPA or not. Monitoring all deployed robots or automated processes was not considered a priority for business people because not everyone wants the technology to succeed, based on their fear that RPA can

easily replace humans by performing tasks or processes that they do daily. This was expressed by one of the business people who stated that:

“People don’t consider the advantages of RPA in their work environments but are rather focused on their fear that RPA could take their jobs away” (MZP11,3:127-128).

The negative attitude that many employees in the business units had toward the deployment and use of RPA did not mean that the solution was not useful to the business, but rather destructive of their day-to-day roles in the organisation. This required manageability, which was farfetched, as many of the employees distanced themselves from such responsibility. The manageability includes strategic dissemination of information, training, and addressing challenges. Therefore, it was rather normal to feel threatened when a disruptive technology, RPA, was introduced into the different business units, especially when there was not much information and training from the bank for the employees to understand their roles and responsibilities post-deployment of RPA. Instead of focusing on manageability, the bank had rather outsourced services and skills. One of the participants briefly explains as follow:

“We have the skills in the bank and the leadership to drive great initiatives such as RPA. However, the problem is that the bank hires external consultants to do work and not enable the internal employees to learn and drive RPA initiatives” (MZ06,2:67).

The lack of RPA knowledge has created an attitude in the business people not to find RPA useful. Consequently, this created a negative attitude towards the employees’ eagerness to upskill and be part of the RPA initiatives. The attitude of some employees in the business units was influenced by ‘hearsay’ about RPA and not what RPA is capable of. The lack of understanding and knowledge will amount to increased fear that the use of RPA will result in job losses. This was stressed by one of the business people who stated that:

“RPA is not prioritised because maybe it’s a mindset thing, and people are resistant to change. The other thing is we so busy with business as usual (BAU) that we don’t have time to apply our minds to using technologies such as RPA” (MZP04,2:87-89).

The attitude towards using RPA in Misuzulu Bank was based on various factors such as feelings, lack of knowledge, emotions, and lack of manageability. These factors manifested from different sources, including misinformation, misunderstanding, and ‘hearsay’ about the technology. This

impacted the way many IT specialists and employees in some business units felt about the deployment and use of RPA in the organisation.

5.3.4 Actual system use

The actual system use component of TAM is defined as how users find using the technology easier and less complex to use when more users use the technology (Taherdoost, 2018). Based on this perspective, this study seeks to understand the actual use of RPA in Misuzulu Bank. As of the time of this study, although RPA was deployed and used in the organisation, there was no approach and strategy on the actual use of the RPA technology. This created many challenges, which were of technology and business-related nature, such as integration, coexistence with long-serving technologies (legacy systems) and lack of manageability.

From the IT department's perspective, the actual use of RPA lies in the visibility of the technology solution. This means that the solution was being used and was part of operations and strategic approaches of the organisation. To this extent, there is (at the time of this study) an RPA dedicated unit within the IT department of the organisation. This was considered a good indicator that the use of RPA in Misuzulu Bank was there to stay for organisational purposes.

Despite these efforts, there was no clear direction of how the RPA unit was enforcing its mandate to demonstrate RPA capabilities and usefulness to the business units. This contributed to mixed emotions and reactions to the acceptance and use of RPA in the organisation. These mixed emotions may arise from the point of no direction and clear mandate from the bank management on how RPA is being used and how the employees will be affected by the implementation of RPA. The perception of the actual use of RPA from both IT and business people was crucial to understand and establish how RPA is being used and implemented in the bank. One of the IT specialists stated that:

“Employees in the bank know about RPA as the RPA unit works with lots of business units which enables awareness of RPA. People are very excited”
(MZP03,5:191-192)

The perception of the IT people was vital as they play a huge role in raising the awareness of RPA in the bank and the drive toward actual use of the solution. It is transparent from an IT perspective that the bank uses RPA and has trained some people in the IT department on how to deploy, enable, support and use the technology. Thus, there were different roles concerning the RPA, ranging from RPA developer and data analyst to process engineers and project managers. As a result, Misuzulu Bank automated many processes by using RPA, to the extent, the bank developed

an in-house RPA solution that is owned and monitored internally. One of the IT specialists stated that:

“The bank already has more than 100 robots running, and all these robots are in the production environment, running on the RPA tool that was developed internally by the bank” (MZP03,1:17-18).

The bank has encountered many challenges in its RPA journey based on the decision to use its in-house developed tool. The challenges emerged when the bank decided to move from using a proprietary (third-party) tool to developing its own. This included challenges from developing, testing, and implementing the RPA tool. The change of the RPA tool also required new skillsets from the RPA unit employees, and this caused a delay in the automation of new processes and moving existing automated processes from the third-party tool to the in-house tool also required effort and time from the RPA team. One of the IT specialists stated:

“The challenge that I encountered was having to learn a new language which is Python. We were only given a week to do so and know it to the extent of applying it” (MZP08,3:97-98).

The business seems to be the most affected unit as the actual use of RPA impacts their working environment either positively or negatively. The positive side would mean that RPA is considered helpful in the business processes. However, the negative side is that most employees resist using RPA based on either fear or ignorance. This somehow contradicts the IT department’s standpoint about the actual use of the technology solution in the organisation. Even though the bank has deployed more than 100 RPA-related solutions, contradiction and instability exist. This contradiction exists because there were no agreed business and technology requirements that could be used to measure, assess, and evaluate the use of the solution. An employee in one of the business units stated:

“We realise that the spaces that we audit have got some robotics initiatives, at some point the audit unit attempted to automate some of the processes. However, none were implemented into the production environment” (MZP12,1:9-11).

There is no clear mandate on the actual use of RPA in business units, and therefore some of the business people do not use RPA to enhance productivity and efficiency for their processes. This can be attributed to governance or manageability that are specific to RPA operations. It could be that RPA was not formally introduced to business units and business people are not required to use it, or the use of RPA is introduced, and business people choose not to use it due to their fear

that the technology could potentially disrupt their processes. Most of the business people are of the assumption that adopting new technologies is costly and might not be worth it. One of the participants alluded by saying:

“it’s very costly to make transitions to emerging technologies such as RPA, and I feel like a lot of these investments that have been made were basically made to get off legacy systems, and it’s not necessarily to get onto systems that are ready for the future like RPA” (MZ06,1: 27-28).

There seems to be a contradiction between IT specialists and business people on the actual use of RPA, which could result from no clear mandates and no harmony between the IT department and business units. There is an RPA unit within the IT department in Misuzulu Bank. However, not all business units are aware of that. Some business units use RPA independently without involving the RPA unit and encounter cost complications, whereas if they used the RPA unit, they would not have such challenges as there is an in-house RPA tool.

5.4 CONCLUSION

The adoption and use of the RPA solution is not holistic in Misuzulu Bank. This is because not all employees, from both IT and business, share the same view and opinion. Both IT and business people allude that management and the leadership team are not prioritising the actual use and implementation of RPA. The knowledge of RPA that most employees have is based on ‘hearsay’ and not on training provided by the bank for awareness and upskilling of employees. The use of the in-house developed RPA solution could benefit all departments within the bank. However, due to the employees not having enough transparency of RPA initiatives and what the RPA unit is doing and using in the bank, some departments end up using costly third-party solutions. The lack of awareness has created panic and fear that the use of RPA will result in job losses, especially for business departments that have repetitive tasks in their day-to-day operations. From the analysis presented above, findings and interpretation were made to assist future deployment and use of RPA in any financial institution in South Africa.

CHAPTER 6: INTERPRETATION OF THE FINDINGS

6.1 INTRODUCTION

This chapter presents the interpretation of the findings from the data analysed using the Technology Acceptance Model (TAM) in Chapter 5. Based on the analysis performed, the data was interpreted, and the findings were concluded to answer the research questions discussed in detail in Chapter 1. The study's objectives were to understand the factors that influence the adoption of RPA and examine how RPA is currently adopted in the context of financial institutions in South Africa. The study aimed to propose a solution through a model that can be used to guide the adoption of the RPA. In the end, a conclusion about the chapter is drawn.

Based on the aim of the study as stated above, data was collected and analysed. The data analysis is presented in Chapter 5. Sequentially, the findings from the analysis are presented and interpreted in this chapter. The chapter is divided into four main sections as follows: the introduction in the first section; in the second section, the findings from the analysis are presented; the third section presents the interpretation of the findings and the model to guide the adoption of RPA in South African financial institutions; and finally, a conclusion of the chapter.

6.2 FINDINGS FROM THE ANALYSIS

As introduced in Chapter 1 and discussed in Chapter 3, the technology acceptance model was applied in the analysis. It was considered most suitable to achieve the objectives to understand the factors that influence the adoption of RPA and establish its requirements through its variable, as shown in Figure 1.2. Using empirical evidence from the participants, the analysis focused on the perceptions that come from individual experiences and opinions.

From the analysis presented in chapter 5, six factors were found to influence the deployment and use of RPA in the financial institution used as a case in this study. The factors are as follows; (1) Readiness assessment; (2) Legacy systems; (3) Integration of current systems with RPA; (4) Success factors – implementation and use of RPA; (5) Alignment between business requirements and RPA functions; and (6) Manageability. Also revealed from the analysis is the fundamental relationship between the factors, indicating that the factors do not operate in a vacuum or in isolation in influencing the deployment and use of RPA in the organisation. The factors are connected and depend on each other. Figure 6.1 below is used to illustrate the connection and relationship between the factors.

6.3 INTERPRETATION OF FINDINGS

The interpretation of the findings is made to assess whether they confirm what was found in the literature review or not and assess how they add new insights to the body of knowledge. Findings are interpreted to bring meaning and construct different experiences and views collected from the analysis. Schünemann et al. (2019) state that data is interpreted to conclude what was found. The findings indicated that six critical factors exist and can guide the adoption of the RPA. The six factors that influence the deployment and use of RPA are seen in the model below:

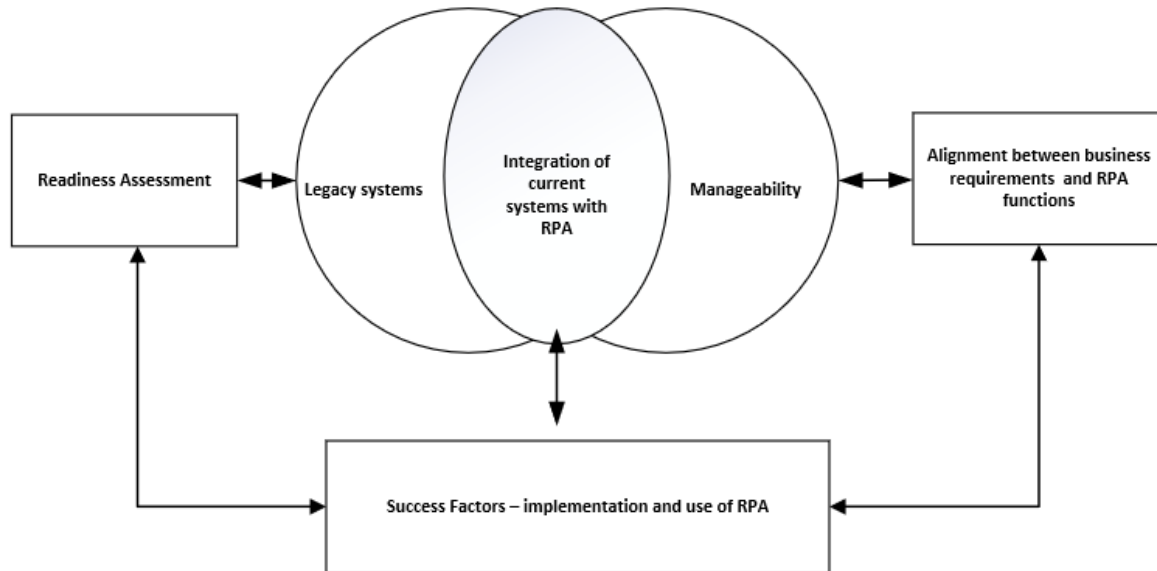


FIGURE 6.1: RPA ADOPTION

6.3.1 Readiness assessment

Readiness assessment is defined as a process, or an analysis conducted to examine if an organisation is ready for change or not (Webster & Gardner, 2019). As revealed from the analysis, Misuzulu Bank did not conduct a readiness assessment to check if employees from the IT department and business units were ready to adopt and use RPA. There are many areas where assessments can be conducted from both the business and IT units' perspectives. In the deployment of RPA, some of the essential areas include resource capability (such as skillsets and development), environmental needs, technology fit, and communicative scheme.

Environmental fit entails an understanding of 'as-is' vs future needs. Communicative scheme refers to approaches for creating awareness and clarifying misunderstandings between actors (Shaanika, Maletzky & Iyamu, 2018). According to Zhang et al. (2020), every organisation should have a unit in the IT department that focuses on transferring technology awareness and readiness. As revealed

from the analysis, the bank did not train its employees on the capabilities and functionalities of RPA. As such, the employees were not ready for the deployment of the technology, which heightened the fear of job losses in deploying RPA in the organisation. There are technology tools that can be used to assess readiness (Botha, 2018).

Lack of organisational readiness has impaired the adoption of innovative technology in Misuzulu Bank. This was noted through a misalignment of information on the use of RPA identified by both business and IT specialists. In addition to tools, some existing models can guide and assess organisational readiness for innovative technologies such as RPA (Akunyumu et al., 2020). Bakke (2017) stated that organisations should use the Technology readiness levels (TRL) tool to evaluate the readiness and environment before adopting and using a new technology. Technology readiness can be conducted in different stages through training, practical exposure, and actual technology use to test how users react and feel about the new technology. This evaluation is done to assess whether users are ready and understand where the challenges are and how exposure can be conducted to enable the acceptance and use of RPA.

6.3.2 Legacy systems

A legacy system is used to describe IT solutions with longevity that have little, or no flexibility change to its operability (Bakar, Razali & Jambari, 2019). Misuzulu Bank continues to rely on legacy systems, as revealed from the data analysis. This reliance is because the organisation finds it hard to let go of legacy systems due to the complexities and possible risks associated with changing and moving to a newer or more dynamic platform (or system). Regardless of the complexities, it was noted during the analysis that Misuzulu Bank does adopt modernised innovative technologies but struggles to integrate the new technologies with the legacy systems. One of the complex issues is that the speed at which legacy systems run is not often compatible with emerging (modern) technologies like RPA. The challenges of that lack of compatibility between legacy systems and RPA remain, irrespective of the platform or enabling technologies.

The future thinking is shifting the narrative to automate most processes in organisations by using existing data to shape a smarter working environment. This shift was proven to be a problem in Misuzulu Bank due to their reluctance to change but continue to depend on legacy systems for business operations. Arguably, the main concern for not moving from legacy systems to modernised technologies is heaped on the fear that arises about data security. However, Al-Ali et al. (2019) argue that security of data exchange between systems should not prevent organisations from doing away with legacy systems as there are security controls and approaches that can be used to guide the change process.

The use of legacy systems in Misuzulu Bank has resulted in RPA being slow and not efficient as the technology is supposed to be. Rutaganda et al. (2017) state that legacy systems are becoming an expense to organizations due to their constant need to be maintained and not easily upgradeable. As revealed by the analysis, moving from legacy to a modern dynamic platform (or system) is proven not to be an easy migration. Moreover, Desai (2020) argues that many organisations have not done away with legacy systems due to uncertainty of whether RPA is really required or not. As revealed from the analysis, there is a contradiction within the Misuzulu Bank, arising from a misunderstanding between two units shaped by different experiences. The IT department wants efficient rollout of RPA while the business units continue to prefer legacy systems over RPA capabilities.

6.3.3 Integration of systems

The integration of current systems with RPA was one of the major issues noted in the data analysis. Rutaganda et al. (2017) argue that without proper integration between current systems and emerging technologies, no value will come from adopting technologies such as RPA. As revealed from the analysis, the Misuzulu Bank does not seem to have a thorough understanding of how to integrate current systems with RPA even though the integration of RPA with existing systems does not require changes to the former for effectiveness. RPA operates in the user interface via the backend and through an application programming interface (Stolpe et al., 2017). Integrating current systems with RPA means that RPA can simultaneously capture and process different processes using different applications (software). Vijai, Suriyalakshmi and Elayaraja (2020) state that RPA is so powerful that it can communicate with different applications to integrate and process repetitive tasks.

The use of RPA is different when integrated with other systems in an environment. Egiyi and Chukwuani (2021) state that RPA can act as a facilitator between existing systems regardless of system integration issues. As revealed from the analysis, RPA is being used by Misuzulu Bank as a bridge to systems that are not integrated to communicate and share data for processing. Alternatively, organisations do not require to have all their systems integrated due to RPA capabilities to integrate stand-alone systems into a single fold (Schmitz, Stummer & Gerke, 2019). The complexities of systems integration are influenced by the challenges of legacy systems. As a result, Misuzulu Bank struggles to enable its departments and employees to share systems, including modernised technologies.

The issue of systems integration is not a new thing. Money (2020) states that many organisations struggle with systems integration for years. One of the reasons is that it requires the sharing of resources, which can be very complicated. The RPA brings a fresh perspective in this respect

primarily because it enables resources such as data to be shared between multiple systems without dependencies. As Madakam, Holmukhe and Jaiswal (2019) alluded, RPA is a systems integrator for organisations that lacks systems' integration and is a non-destructive solution that does not require any system changes and system replacements. As revealed from the analysis, the Misuzulu Bank has experienced systems integration challenges through the years. On this basis RPA was adopted to help bridge and facilitate the integration of processes and information sharing between organisational systems.

6.3.4 Success factors – implementation and use of RPA

The implementation and use of RPA in Misuzulu Bank is proven to be of materialistic value. This criticality requires it to have success factors to ensure the implementation fulfils its objectives. The Misuzulu Bank has implemented and adopted RPA for use in automating mundane, repetitive tasks. The success factors come from both internal and external influences and impact technical and non-technical aspects of the technology within the bank. According to Nasir and Sahibuddin (2011), in organisations there are critical success factors, and some of the most common ones are (1) Organisational strategy; (2) human resources; (3) business operations; (4) marketing and advertising; and (5) finance and payments department. These factors can be considered in developing critical success factors for implementing the RPA in Misuzulu Bank. The factors fortify the management and leadership of the bank in driving innovative initiatives such as RPA. This is critical in that strategic plans and their implementations are driven from management and leadership perspectives. As revealed from the analysis, the Misuzulu Bank has not prioritised RPA as every department's key performance indicator (KPI), and this was alluded to by most employees who participated in the study.

Consequently, the business operations in the bank need to be tailored to ensure that RPA is used effectively and efficiently in enhancing the objectives of the organisation. In Misuzulu, as revealed from the analysis, most processes and tasks are executed from legacy systems and are incompatible with fast operating technologies such as RPA. Transforming business operations into RPA enablement implies that 'back office' operations are modified to support compatibility, flexibility and compliance. Willcocks et al. (2015) state that organisations need to consider transforming low-performing backend processes using automation to enhance business operations. As revealed in the analysis, the business operations that benefit the most from the use of RPA are backend processes where employees perform mandate-critical tasks that could be cost-prohibitive to the bank. This often happens when an operation is incorrectly executed as many backend processes are monetary-driven. Therefore, implementation and use of RPA in 'back office' operations must be successfully implemented.

The use of marketing to ensure that employees are aware of the RPA is material in the bank. However, as revealed in the analysis, there is no clear mandate from management on how they communicate with employees on the developments, initiatives and future states in using RPA to enhance banking activities and processes. The use of RPA is a digitally enabled approach that requires buy-in from management for prioritisation purposes. This increases the chances of success within the environment of the bank. In addition, the use of RPA can transform core banking processes if appropriate processes are automated, and awareness is raised within the bank. Furthermore, RPA can be used to advertise products and services to the banks' existing and potential clients. Lastly, the finance department is the driver in ensuring the successful implementation of RPA in acquiring licenses, upskilling and machines required to execute. The finance department has mundane tasks that are prone to human errors and can be automated using RPA to decrease losses due to human errors during processing or releasing payments.

6.3.5 Alignment between business requirements and RPA functions

The alignment between business requirements and RPA functions was noted as a critical issue from the analysis. This is attributed to the conflict that arises from different understandings between the business divisions and the RPA unit. The various understandings are caused by the lack of knowledge and fear that the implementation of RPA brings. Some employees within the business divisions fear that RPA will take over processes and make them redundant, a job security threat. Siderska (2020) argues that there is no need for employees to fear RPA; instead, humans should try to understand their role during the planning and implementation of automated processes. Mahadeo (2020) states that when management transforms business operations by introducing technologies such as RPA, they should better inform and equip their employees to understand exactly how such technologies will transform their environments. As revealed from the analysis, there seems to be no alignment between business requirements and the RPA division due to management's lack of mandate and guidelines.

The business divisions and the RPA division operate separately in silos, which causes conflict and more confusion between the employees. As revealed from the analysis, some employees alluded that they are not aware of the implementation of RPA and the processes that it automates in the bank. Therefore, this group of employees does not know whether the RPA division is operating as intended or is still trying to understand the use of the technology in the organisation. Arguably, this could result from speculating employees that have no mundane or repetitive tasks that need to be automated. Nonetheless, this issue could stem from the lack of awareness of RPA in the bank and management's involvement in ensuring that all employees receive adequate information to upskill and be better informed. Anagnoste (2018) states that organisations should have ways and

sessions of knowledge sharing and internal demonstrations of how technologies such as RPA could assist in enhancing business processes.

The alignment between business divisions and RPA division enforcement at the level of senior management is lacking. Such approval and enforcement increase inclusiveness, thus increasing the use of RPA by business divisions, including prioritisation, making it a stronger transformational change management agent. Eisenbach et al. (1999) argue that leadership plays a vital role in enforcing change and ensuring that new approaches are adopted and used. In Misuzulu Bank, as revealed from the analysis, there is no clear role from management in the process of adopting the technology. This has a negative effect on the alignment between business requirements and the specifications of the RPA, which could be attributed to a lack of knowledge and understanding in following the change process at the management and leadership levels.

6.3.6 Manageability

Manageability is defined as having control measures in place to control and support technologies implemented in an organisation (Varga et al., 2019). In that context, manageability entails the integration of both new and existing technologies and systems. As revealed from the analysis, in Misuzulu Bank, there seems to be a lack of manageability of the integration of RPA with existing applications and systems because of the continuous silo approach in the environment. Furthermore, the compatibility of RPA with existing legacy systems was not assessed to measure the competence required to use RPA in the existing banking environment. Xu (2020) argues that most organisations struggle with manageability due to a lack of integration between different systems or applications, which may negatively impact operating technologies, such as the RPA.

The integration of existing systems and applications is revealed as a critical but difficult issue to solve in Misuzulu Bank. Most banking institutions find it difficult to move from legacy systems due to the fear of losing data and the complications of the process that could potentially derail business continuity and technology management. Niforos et al. (2017) state that banking institutions face higher risks adapting to modern systems and applications due to over-reliance on legacy systems. Digital innovations are disrupting the banking industry and manageability is more complex and costly. The biggest concern from banking institutions is their fear that integrating systems and applications with modern technologies such as RPA, which also uses cloud storage, could expose critical client information (Schrieck & Wiesche, 2017).

There is no clear manageability of current systems and applications to be competent with RPA in Misuzulu Bank. As revealed from the analysis, speed and competence with current systems and applications within Misuzulu Bank is currently a critical issue. The use of legacy systems is expensive to support, and the compatibility of legacy systems with RPA is complex and unreliable.

However, Rutaganda et al. (2017) argue that RPA might be the glue the bank needs to integrate into current outdated systems to meet customer demands and needs. The systems and applications currently being used in the bank do not have to be changed for RPA to operate. However, for RPA to operate as intended, speed and ease of use should be measured to deploy and integrate RPA with legacy systems successfully.

6.4 CONCLUSION

The adoption and implementation of RPA in Misuzulu Bank is not yet fully mature. As noted in the interpretation of findings above, the organisation needs to perform a readiness assessment to ensure that all employees are aware and are ready for this disruptive change. The Misuzulu Bank should move their business processes from legacy systems as the RPA environment requires that all systems and applications be integrated and managed for ease of use and efficiency. The alignment of business requirements and the RPA functions should be communicated and outlined to ensure that RPA is used and implemented to automate mundane tasks successfully.

CHAPTER 7: CONCLUSION

7.1 INTRODUCTION

This chapter concludes the study. The study presented the literature review in Chapter 2 and the research methodology in Chapter 3. The case overview was presented in Chapter 4, Chapter 5 presented the data analysis, and in Chapter 6, the interpretation of findings was presented.

For ease of logic and understanding, the chapter is structured into six sections. In the first section, an overview of the chapters is provided. The evaluation of the study follows this. The third section presents and discusses the limitations of the study. The fourth section discusses prospects of further studies and the recommendations, followed by the study's contribution in section five. Finally, a conclusion about the study is drawn.

7.2 OVERVIEW OF THE CHAPTERS

This section provides an overview of the chapters covered in the study; in Chapter 2, a literature review was intensively covered to discover what exists in the body of knowledge on the use and adoption of RPA in organisations. The literature reviewed enabled this study to determine what is known about RPA within the financial institutions, the gap of what is unknown, and what is yet to be discovered on RPA. In Chapter 3, the research methodology identified the approach and technique that the study followed to research RPA. The philosophical assumptions were discussed, along with research method, research design, data collection, data analysis and the unit of analysis.

The case overview was presented in Chapter 4, which discusses how fieldwork was conducted in Misuzulu Bank to familiarise the reader with the organisation and understand the different departments and structures within the organisation. According to Harling (2012), a case overview outlines how the organisation was selected to provide a general overview of the group of people and units within the organisation which are examined to answer the research questions and provide an in-depth analysis of the case. The data analysis through semi-structured interviews was presented in Chapter 5, where the data was logically described and analysed using the TAM. Lastly, the findings were presented and interpreted in Chapter 6 where a model was proposed to guide the adoption of RPA in South African financial institutions.

7.3 EVALUATION OF THE STUDY

The research evaluation is to assess how the study was carried out and the relevance of the research to the body of knowledge. The purpose of this study was to explore the adoption of RPA in financial institutions in SA. The objectives of the research were:

- To gain an understanding of the factors that influence the adoption of RPA in the context of financial institutions in South Africa
- To establish the requirements for the adoption of the RPA as a solution for financial institutions in South Africa.
- Based on findings from the above objectives, a model is developed, to guide the adoption of the RPA solution.

The main research questions were as follows:

- How can an RPA adoption model be developed to guide the adoption of RPA in financial institutions in South Africa?
- What are the factors that influence the adoption of RPA in the context of financial institutions in South Africa?
- What are the requirements that can be used to guide the adoption of the RPA in South African financial institutions?

Research conducted does not show the integration of RPA with employees, which has led to employees resisting the use of RPA due to misinformation and 'hearsay' about the technology. This is because organisations do not know how to put the two in synergy, the use of RPA and the employees' contribution to the adoption and use of the technology. The adoption of RPA in most financial institutions is driven and motivated by the processing of mundane, repetitive tasks, which are most likely due to human error, and could be a factor of memory or attention issues. The use of RPA has created an automated workforce that enhances production and efficiency within Misuzulu Bank. However, regardless of the years Misuzulu Bank has invested in the adoption of RPA, the management has not yet found harmony between the employees and the technology. Management has not prioritised creating and maintaining the relationship between the workforce and RPA.

7.4 LIMITATIONS OF THE STUDY

The study applies to financial institutions and focuses on the financial sector only. The study is limited to the South African context and can only be applied using the same outcomes in SA and developing countries' perspectives. Other aspects of RPA, such as programming, are excluded from the scope. There is currently limited literature about the adoption of RPA in financial

institutions, especially in developing countries. There was a lack of previous research on the adoption of RPA in banks, and indeed the financial sector.

7.5 FURTHER STUDIES AND RECOMMENDATIONS

The recommendation for further studies is to conduct similar research employing different methods to compare the outcomes of the study. The study can be conducted in a different sector rather than the financial sector or a country facing a similar adoption and new technology use. A similar study can be conducted for the adoption and use of any disruptive or innovative technology in an organisation. Where the researcher has the access and time to conduct the study in different banking institutions, the study can use multiple cases. Further research can be done in the financial sector, focusing not only on the adoption but also the other roles of RPA in banking.

7.6 CONTRIBUTION OF THE STUDY

The study contributed theoretically and practically to the body of knowledge on the adoption of emerging technologies in the financial sector and created a model that can be used by any sector adopting RPA as a technology. At the time of this study, there seemed to be no model to guide the adoption of RPA in South African financial institutions. Also, the study will add to existing literature. The study is intended to benefit both IT and business personnel in financial institutions, primarily because it will help them better understand the factors that influenced the RPA adoption in their environments. This includes how the solution can be adopted complementarily with the human workforce. Practically, the study empirically revealed the factors that influence the adoption of the RPA in financial institutions. These factors can be used as a guide and terms of reference by other developing countries.

7.7 CONCLUSION

There is a gap of knowledge arising from the lack of in-depth research on RPA concerning how employees fear the technology and how organisations introduce and implement RPA (Willcocks & Lacity, 2016). This has resulted in a contradiction of two realities due to the promotion of fear, based on lack of knowledge, that one will overwhelm the other. Organisations need to be transparent with employees by conducting studies around the technology and ensuring that everyone understands its capabilities and what it cannot perform (Oliveira, 2016). The proposed model can be used to guide the adoption of the RPA in financial institutions in South Africa. This model can create a transparent environment between the workforce and the RPA, forming a synergy between them.

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APPENDIX A: INTERVIEW GUIDELINE

1. My understanding is that the bank (Misuzulu) is making or about to start making use of RPA. I would appreciate if you can share your understanding with me.
2. Why do you think the bank is interested in RPA?
 - a. Why do you think so?
3. In your view, why do you think the bank makes use of RPA?
4. Do you think people using RPA are encountering challenges?
 - a. What are some of the challenges that they encounter?
5. Why do you think these challenges exist?
6. Do you think RPA is easy to use?
 - a. Is that your view or experience?
7. Why do you think so? Please give me some examples.
8. In your view, do you think everyone is excited about RPA?
 - a. If yes, why? If no, why not?
9. Why do you think some people are uncomfortable with the technology?
10. In your view, why do you think some people in the organization are excited about the technology?
11. Do you think there is enough awareness about RPA in the organization?
 - a. Why do you think so? Please share some examples with me.

APPENDIX B: INDIVIDUAL CONSENT LETTER



Cape Peninsula
University of Technology FID/REC/ICv0.1

FACULTY OF INFORMATICS AND DESIGN

Individual Consent for Research Participation

Title of the study: The adoption of Robotic Process Automation in a financial institution in South Africa

Name of researcher: Nontobeko Mlambo

Contact details: email: mlambononto@gmail.com phone: 0737693608

Name of supervisor: Tiko Iyamu

Contact details: email: iyamut@cput.ac.za phone: 0716770300

Purpose of the Study: The aim of the study is to develop a model, which can be used as a solution to guide the adoption of RPA in financial institutions in South Africa, in a way that the organization and employees are in synergy in the adopting process.

Participation: My participation will consist essentially of taking part in one interview session, via Zoom, that can last up to 60 minutes during which we will discuss my personal experience regarding the topic of research.

Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used only for the Master's thesis and that my confidentiality will be protected using pseudonyms.

Anonymity will be protected in the following manner: the name of the participant and organization will not be mentioned in the data analysis.

Conservation of data: The data collected will be kept in a secure manner on a google drive folder that will only be accessed by the researcher and the supervisor for the period of data collection and data analysis. All recorded audio from interviews will be encrypted during data collection and data analysis. Once the thesis has been submitted and accepted, audio collected from interviews will be destroyed.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be destroyed.

Additional consent: I make the following stipulations (please tick as appropriate):

| | In thesis | In research publications | Both | Neither |
|-----------------------------|-----------|--------------------------|------|---------|
| My image may be used: | | | | √ |
| My name may be used: | | | | √ |
| My exact words may be used: | | | √ | |
| Any other (stipulate): | N/A | N/A | N/A | N/A |

Acceptance: I, MZP01


agree to participate in the above research study conducted by Nontobeko Mlambo of the Faculty of Informatics and Design at the Cape Peninsula University of Technology, which research is under the supervision of Tiko Iyamu.

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee at 021 469 1012, or email naidoo@cput.ac.za.

Participant's signature:



Date: 15/04/2021

Researcher's signature: 

Date: __15/04/2021__

APPENDIX C: ETHICAL CLEARANCE



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| | |
|--|-----------------------------------|
| Office of the Research Ethics Committee | Faculty of Informatics and Design |
|--|-----------------------------------|

22 April 2020

Ethics approval is granted to MS NONTOBENKO MLAMBO, student number 219040400, for research activities related to the MTech: Information Technology at the Faculty of Informatics and Design, Cape Peninsula University of Technology (CPUT).

| | |
|-------------------------|--|
| Title of thesis: | The adoption of Robotic Process Automation in financial institutions in South Africa |
|-------------------------|--|

Comments

Data collection permission is required from the relevant institution and research activities are restricted to those detailed in the research proposal.

| | |
|---|---------------|
|  | 22 April 2020 |
| Signed: Faculty Research Ethics Committee | Date |