



# **Investigating the factors driving adoption of RPA in South African banking: a qualitative analysis**

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By

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## Abstract

**Background:** Studies have shown that the traditional banking sector is under threat from digital banks and financial technology (fintech) organisations that can operate with a lower cost base and respond to the market faster. In response to this threat, leading banks have implemented Robotic Process Automation (RPA) to reduce costs and simplify operations. The adoption of RPA has, however, proven to be challenging as in many cases the impact of automation technology implementations is perceived to affect the livelihoods of staff who work in banks. Within the South African banking context, there is a particular sensitivity to factors that impede employment and labour unions are deeply involved in protecting workers.

**Objective:** While there is research on RPA implementations, it is limited in the banking context. Further, there is currently little to no RPA adoption research specifically in the South African banking context. This study seeks to investigate the factors that drive RPA adoption in South African banks.

**Method:** This study has used the Technology-Organisation-Environment (TOE) framework, extended with Institution Theory, as a lens to structure an approach in organising RPA adoption factors in an extensive literature review on the phenomenon. Thematic analysis was used to analyse the interview data that was collected. Themes were aggregated and organised by the TOE perspectives to create structure throughout the study.

**Results:** The findings were that the adoption of RPA in South African banks is driven by the expected benefits of RPA which are achieved when well-suited processes are targeted, an effective operating model for the program including business and IT personnel, with the right skills. A well-designed change program is critical for RPA adoption in banks. South African banks are also working closely with the trade unions and are, on the whole, following best practices when automating parts of their workforce's roles by ensuring that they are given the opportunity to work on more engaging tasks.

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# 1 Introduction

## 1.1 Background

Automation as a technology is considered part of the broader Artificial Intelligence (AI) group of technologies that can be defined as software systems imitating human behaviour intelligently (Britton & Atkinson, 2016). Automation and robotics can exist in the combination of hardware and software, and relatively cognitive tasks can be accomplished by sensing surrounding conditions intelligently (Herbert, Dhayalan, & Scott, 2016). Automation is not a new concept and is already prevalent in Automated Teller Machines (ATM) in the banking environment (Dilla & Jaynes, 2015). Traditional software automation is screen scraping and scripting which operates at a low level of automation (Willcocks & Lacity, 2015). Robotic Process Automation (RPA) is a new breed of software technology that makes use of software robots to carry out digital business processes that were previously performed by people. Technically, automation is a system that can be configured using 'if/then' logic to handle a task (Stople & Steinsund, 2017). As industrial robots automate manual labour in manufacturing, RPA can automate manual labour with data and information (Kirchmer, 2017).

Leading banks have started experimenting with RPA implementations, but that fact that few have managed to take advantage of the perceived benefits offered by the technology cannot be ignored by other leaders of banks (Lamberton, Brigo, & Hoy, 2017; Stople & Steinsund, 2017). The benefits that are documented in manufacturing are more innovation, cost reduction and better decision-making, however research literature in other industries is lacking (Britton & Atkinson, 2016). Many organisations remain sceptical about RPA and its benefits and some organisations that have implemented RPA are grappling with best practices to improve maturity (Willcocks, Lacity, & Craig, 2017).

## 1.2 South African Banks

In the Global Competitive Report, South African banks are ranked 37<sup>th</sup> in the list of most sound banks in the world (World Economic Forum, 2017). The banking industry contributes to 10.5% of South Africa's GDP which is significant contribution in terms of the percentage of the South African population that rely on banking for employment (Erasmus & Makina, 2014). It has been the "big four" banks that have traditionally dominated the market in South Africa: ABSA, First National bank, Nedbank and Standard bank (Banking Association of South Africa, 2020). In the last few years however, Investec and Capitec have increased their market share as challengers, and along with non-financial service providers have spread the market more evenly (Banking Association of South Africa, 2020). Listed banks in South Africa represent over 85% of all banking assets, but they only represent seven out of the 76 registered banks (Du Toit & Cuba, 2018).

The banking industry has relatively high operating costs compared to other industries, which inherently results in a focus on savings and efficiencies that will drive down costs (Du Toit & Cuba, 2018). Competition between banks is another driver of efficiency through innovation and focus on costs (Du Toit & Cuba, 2018). Banks measure their efficiency by using a cost-to-income ratio (Erasmus & Makina, 2014) and digital technology, including automation, creates operational efficiency and rich data allowing banks to make swift decisions. Automation however, would not replace personal

customer relationships which are key to the South African market (Banking Association of South Africa, 2020). The banking context of this research has focussed on listed South African banks.

### 1.3 Problem statement

Based on South African banking being highly competitive among the top banks and risk of Fintech's undercutting the market from a bank charges perspective, this study seeks to investigate the factors that affect the adoption of RPA in the South African banking context. South African banks gain overall efficiencies through innovation in order to improve their cost-to-income ratio and improve their profitability (Du Toit & Cuba, 2018). RPA is an innovative technology that is believed to create efficiencies in organisations by automating business processes (Lacity, 2017). Banks are implementing RPA to take advantage of the associated benefits of RPA (Stople & Steinsund, 2017). The majority of research cites that the implementation of RPA brings reduction in administrative time spent by staff as part of their operational role within the organisation (Cahill, 2017). By implementing RPA and automating administrative tasks, the expectations are that a reduction in staff would follow (World Economic Forum, 2017). However, there are other benefits to implementing RPA that banks need to consider as part of a holistic decision to adopt RPA (Willcocks, Lacity, & Craig, 2015b). Furthermore, banks are repurposing the time saved by automating administrative tasks and allowing staff to work on more engaging activities, thus improving the value that staff are adding to the bank (Stople A. , Steinsund, Iden, & Bygstad, 2017). Software robots can be used to augment teams and balance efficiency, rather than for human replacement purposes (Stople A. , Steinsund, Iden, & Bygstad, 2017).

The labour costs in South Africa present less opportunity for banks to minimise staff costs than in developed countries. It is predicted that just more than 40% of jobs in South Africa could be automated (World Economic Forum, 2017), and South African trade unions are already concerned about the impact on the labour force in local banks (SASBO, 2018).

There is a lack of research cases on RPA in financial industries and further research needs to be added to literature to contribute for the purposes of research generalisation (Stople & Steinsund, 2017). The social behaviour in the banking industry is unlike other industries and therefore it is challenging to generalise the factors that drive adoption (Ringim, Razalli, & Hasnan, 2012). Quantifying the benefits of automation is difficult and is moderated by the volume of financial transactions impacted by automation (Trkman, 2013). The research on the success and failure of Business Process Management (BPM) is conflicting with some claiming that the technology has not managed to deliver on the expected benefits (Ringim, Razalli, & Hasnan, 2012). In research articles relating to the implementation of RPA, the recent cases cite important lessons learned that when applied, impact the successful delivery of automation in organisations (Lacity, 2017).

### 1.4 Importance of research

This purpose of the research is to understand which factors impact the adoption of RPA in the South African banking industry. The contribution of the research will be to help banks understand the factors that would improve adoption, the value of adopting RPA, and the possible effects of adoption by discussing the factors in the banking context and areas of application. The impact of automation has been documented in other studies, relating to other forms of automation and industries, to affect employees' livelihoods and this research aims to understand the impact of automation on

bank employees in South Africa. The research also aims to contribute to the body knowledge, to present more cases of RPA adoption in the banking industry.

## 1.5 Research method

The Technology-Organisation-Environment (TOE) framework has been used to shape the structure of the research paper and has also been used as the research framework to understand the factors that drive RPA adoption in South African banks.

## 1.6 Research question and research objective

**The primary research question is:** What factors influence the adoption of RPA in South African banks?

**The sub-research questions are:**

1. What **Technology** factors affect the adoption of RPA in South African banks?
2. What is the **Organisational** impact on employees for banks adopting RPA in South Africa?
3. What **Environmental** and institutional pressures contribute to the adoption of RPA in South African banks?

The primary objective is to understand the factors that affect the adoption of RPA in South African banks. RPA research is limited in the literature, but the perceived benefits of RPA are compelling for banks to embark on implementing RPA (Stople, Steinsund, Iden, & Bygstad, 2017).

Automation of banking operations is not new, following Automated Teller Machine (ATM) development, but the opportunity that RPA presents is that automation would be more broadly spread through the bank (Dilla & Jaynes, 2015). The consequence of automating the back and middle-office functions is that bank employees, that is “human workers”, currently carry out these tasks may become redundant. A sub-objective is to determine the impact on Bank employees following RPA adoption.

Institutional theory posits that organisations are coerced into change for various reasons (DiMaggio & Powell, 1983). A sub-objective is to understand the driving motivation for banks in South Africa to adopt RPA.

## 1.7 Limitations of research

The literature searches revealed limited research conducted on RPA and therefore the body of knowledge lacks cases for generalisability of the technology. This was a motivation for the qualitative approach taken: to ensure that the phenomenon could be explored in-depth and add to the body of knowledge for future researchers to build a frame of reference. The existing research limited the ability to test a theoretical model or framework due to the lack of cases for generalisation. Therefore, a framework was used to guide the research rather than testing constructs of a theoretical framework.

The sample of the research was based on employees who worked at the major banks in South Africa. The qualitative nature of the research resulted in rich information being gathered from participants to understand the factors that drive adoption in the banks and the effect of adopting RPA. The sample is not necessarily representative, and the findings should not be used for generalising based on the sample group.

In addition, the research timeframe was cross-sectional and therefore based on a point in time and thus the current situation may change over time.

## **1.8 Dissertation overview**

Chapter two contains the literature review, which covers a review of the RPA relevant literature covering the synthesized adoption factors found in the literature. It also introduces the TOE framework that will be used to guide the research.

Chapter three presents the research objectives and research questions.

Chapter four details the research design and methodology adopted.

Chapter five presents the findings from the thematic analysis conducted on the transcribed interview data and triangulates some of the findings with the literature to answer the research questions.

Chapter six ends off the dissertation with the conclusion, recommendation, and suggestions for future research.

## 2 Literature review

### 2.1 Background

RPA is the next level of automation where software robots (bots) are created as virtual works in order to fulfil tasks that would traditionally be carried out by human staff (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). The most basic use case could be copying data from an email system and inserting it into a different application (Stople & Steinsund, 2017). This has been described as “swivel chair” integration because RPA is able to log into one system and transfer data into another without any backend integration, imitating a human on a swivel chair accessing different systems (Willcocks, Lacity, & Craig, 2015d).

RPA is not designed as a business application but rather to operate other business systems by sitting on top of existing infrastructure within an organisations (Dilla & Jaynes, 2015). In RPA terms, a robot is defined as a single software license (Willcocks, Lacity, & Craig, 2015c). The characteristics of a good RPA task candidate are repeatable, definable, and rules-based (Dilla & Jaynes, 2015). There are two defining characteristics that separate RPA from other automation software, including Business Process Management (BPM). Firstly, configuring RPA tasks does not require any programming skills and common providers use drag and drop functionality for configuration. Secondly, RPA does not need to integrate with any of the systems or applications that the automated process interfaces with, as all interaction is done through the front-end impersonating a user (Willcocks, Lacity, & Craig, 2015d).

In terms of sophistication, RPA can be distinguished from other cognitive technology or AI by the type of data it is able to process, the processes, and the outcomes (Willcocks, Lacity, & Craig, 2015a). RPA can only process structured data based on rules-based processes with a single outcome, while AI is able to process unstructured data, processes inference-based processes, and produce a set of likely answers (Lacity, 2017). Cognitive technology can also be categorised based on intelligence into rules-based automation, knowledge-based automation, and AI (Willcocks & Lacity, 2015). Other AI technologies include Natural Language Processing (NLP), Chatbot’s, speech and image recognition, and machine learning (Grung-Olsen, 2017). The integration of other AI technologies and RPA increases the effectiveness of a solution since structured and unstructured data can be handled (Kirchmer, 2017). Intelligent Process Automation (IPA) is recently being referred to when combining AI and RPA to solve a more complex automated task (Bollard, Larrea, Singla, & Sood, 2017). The cost of cognitive robotics is much higher than RPA and should only be applied to processes of high value (Lamberton, Brigo, & Hoy, 2017).

Some banks have already started implementing RPA and the challenge is for the technology to be properly embedded in the environment to gain a sustained advantage (Stople & Steinsund, 2017). There are many reported business use cases in banking for RPA with opportunities for efficiency in terms of time and effort to be gained (Cahill, 2017). The efficiencies created by RPA will reduce the requirement for human workers that previously carried out tasks following automation (World Economic Forum, 2017). However, organisations should not only look to efficiencies through staff reduction as there are more compelling factors that support the adoption of RPA (Willcocks, Lacity, & Craig, 2015a). Banks that have implemented RPA are able to reallocate staff to more interesting work

and have augmented teams with bots rather than replacing staff (Stople, Steinsund, Iden, & Bygstad, 2017).

A systematic approach was taken to develop the literature review following limited quality references in the literature. At the start, keyword searches for “Robotic Process Automation” and variations of the phrase were used to acquire as many quality articles from scholarly databases. The quality articles were then forward and backwards searched and, in some cases, the authors contacted for full versions of their reports (Diniz, Porto de Albuquerque, & Cernev, 2011; Hoehle, 2012; de Albuquerque, Diniz, & Cernev, 2016). Due to the limited articles for RPA found, similar technologies, as advised by researchers, were researched in order to broaden and deepen the context (Willcocks, Lacity, & Craig, 2015). Business Process Management (BPM) is an automation technology set used to automate business processes and has similar characteristics to RPA (Stople & Steinsund, 2017). The following section discusses RPA in more detail.

## 2.2 Business Process Management (BPM) and RPA cases

RPA research is currently limited, including cases in banking (Leopold, van der Aa, & Reijers, 2018). BPM has been more commonly researched and, because the technology is similar, there is relevance in the research to RPA (Stople & Steinsund, 2017). BPM delivers on automating business processes with technology which is similar to RPA but the major characteristics that differ are that BPM needs developers to code the automation whereas RPA can be configured by business users (Willcocks, Lacity, & Craig, 2015a).

### 2.2.1 BPM adoption success factors

Critical success factors for BPM adoption and implementation are a well-researched topic (Ringim, Razalli, & Hasnan, 2012; Huang, Wu, & Chen, 2013; Blasini & Leist, 2013; Trkman, 2013; Vom Brocke, et al., 2014). There is an incongruence in BPM research as to whether BPM has managed to reduce costs and improve customer service because some researchers claim that BPM has failed to meet the expected benefits (Ringim, Razalli, & Hasnan, 2012; Trkman, 2013). Information Technology Information Library (ITIL) recommends managing the expectations of management by assigning a process owner as a critical success factor (Huang, Wu, & Chen, 2013). The major variables that impact the success of BPM are change management, management competence, organisational structure, project management and IT infrastructure (Ringim, Razalli, & Hasnan, 2012). This is aligned with what is found in RPA research confirming the similarity in the technology (Stople & Steinsund, 2017). Change management and sufficient budget including resources are in the top 20% of success factors cited in the literature (Huang, Wu, & Chen, 2013). The social differences in the banking workforce make it challenging to generalise adoption factors from other industries (Ringim, Razalli, & Hasnan, 2012). Measuring and monitoring the success of a BPM implementation is difficult (Trkman, 2013), and the success of BPM adoption is impacted by the volume of financial activities on customer service management (Ringim, Razalli, & Hasnan, 2012).

### 2.2.2 Business process automation maturity

Maturity models have primarily been developed for BPM to drive process governance and consequently have been found to correlate process performance with maturity (Waal, Maris, & Ravesteyn, 2017). The benefits of mature BPM implementations are reduced cost, cycle time and headcount as well as improved quality (Waal, Maris, & Ravesteyn, 2017). Improved BPM performance results in organisations being more efficient and effective (Janssen, Nendels, Smit, &

Ravesteyn, 2015). Maturity models consider factors such as strategic alignment, governance, enhancement method, information technology, people and culture to evaluate the level of BPM maturity (Janssen, Nendels, Smit, & Ravesteyn, 2015). Even though RPA is a relatively new technology, much can be gained from using the same metrics for process automation in BPM (Stople & Steinsund, 2017).

### 2.2.3 Case studies of RPA implementations

The London School of Economics (LSE) Outsourcing Unit has been researching RPA for the past few years and their research is commonly cited in the literature (Willcocks, Lacity, & Craig, 2015b). The research is based on case studies in organisations in different industries (Willcocks, Lacity, & Craig, 2016; Willcocks, Lacity, & Craig, 2015b; Willcocks, Lacity, & Craig, 2015a). LSE's research has evolved as the information on RPA has matured in the literature (Lacity, 2017). LSE has contributed two papers to shared services and IT as capabilities that would be impacted by RPA (Willcocks, Lacity, & Craig, 2015d; Willcocks, Lacity, & Craig, 2015c). Three of the papers have been based on cases at financial institutions (Willcocks, Lacity, & Craig, 2017; Willcocks, Lacity, & Craig, 2016; Willcocks, Lacity, & Craig, 2015b). Each research paper has lessons learned from the case researched and these have contributed to the adoption factors discussed in section 2.3.

In other cases, particular research has been conducted in financial institutions (Britton & Atkinson, 2016; Stople & Steinsund, 2017; Cahill, 2017; Varghese, 2017). A case was researched at an asset management organisation and RPA was used to help on a particular fund administration. An argument is made that automation in manufacturing is mature but is still new to white-collar processes (Britton & Atkinson, 2016). A case study of a Norwegian bank was researched, and the literature is structured in the same way that an RPA project would be implemented. The researchers drew conclusions on lessons learned which have also been discussed in section 2.3 (Stople & Steinsund, 2017). Compliance automation research in an Irish bank found that repetitive banking roles could be effectively automated (Cahill, 2017). Research on the impact of RPA in India describes how the technology has impacted the need for human workers, particularly less-skilled ones (Varghese, 2017).

## 2.3 Adoption factors

The Technology-Organisation-Environment (TOE) framework considers there to be three perspectives of factors impacting technology adoption. The perspectives are technology, organisation and environment (Tornatzky & Fleischer, 1990). Factors drawn from the related literature have been synthesised and organised according to these perspectives and are discussed in this section.

### 2.3.1 Technology-Organisation-Environment

The TOE framework is a contextual framework that considers the context from the technology, organisation, and external aspects and how these affect organisational technology innovation adoption (Baker, 2012; Tornatzky & Fleischer, 1990).

The technological context describes the availability and characteristics of technology that is available to the organisation, both internally (which are existing practices and equipment) and externally (Tornatzky & Fleischer, 1990). The variables of the technology perspective influence adoption from the perspective of an individual, an organisation, and an industry. Perceived benefits, both direct and indirect are variables that have been found to be significant in previous adoption studies and are

relevant for RPA adoption in banks based on the literature reviewed (Gangwar, Date, & Raoot, 2014). Perceived benefits have been cited as significant in the Technology by several researchers (Gangwar, Date, & Raoot, 2014).

The organisational context describes the scope, size, and organisational structure of the organisation (Tornatzky & Fleischer, 1990). The organisational context is made up of descriptive measures for organisation scope, size, and management beliefs (Salwani, Marthandan, Norzaidi, & Chong, 2009). Adoption is determined by the internal organisational communication and support for the initiative as well as the organisation's resources and ability to innovate (Dedrick & West, 2003). As earlier described, significant variables include organisational resources, structure, slack, knowledge and innovation capability, operational capability, management support, use of technology, and trust (Gangwar, Date, & Raoot, 2014). These are aligned and seen to be relevant for RPA adoption in banks in the literature.

The environmental context describes the industry, competitors, and governmental relationships and dependencies (Tornatzky & Fleischer, 1990). The environmental context focuses on factors that influence the industry or organisation that are external to the operations of the organisation. Industry-based competition and social relationships with customers and suppliers are variables considered within this context (Salwani, Marthandan, Norzaidi, & Chong, 2009). Governmental regulation is not considered a significant variable but external, internal and trading partner pressures are considered significant in previous research and are aligned to the literature reviewed for RPA adoption (Gangwar, Date, & Raoot, 2014). The original framework has been depicted in figure 2.

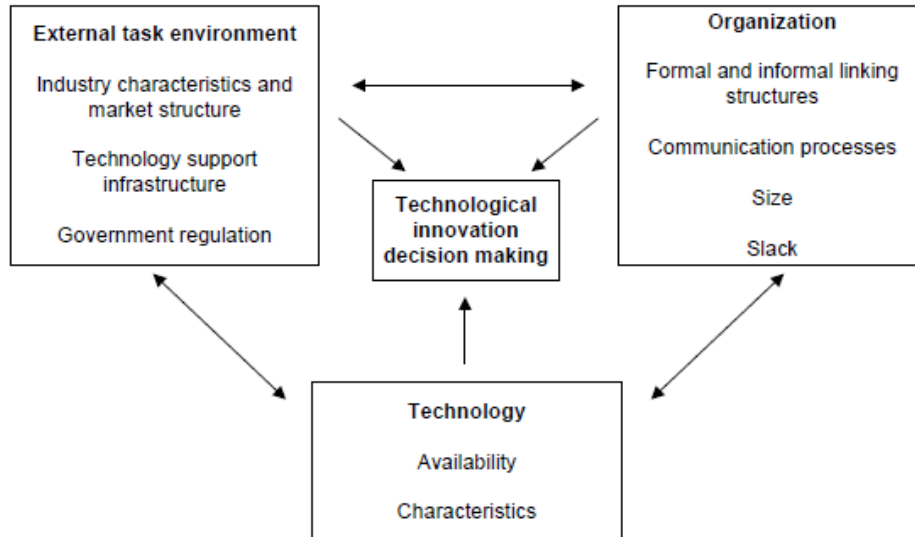


Figure 1 - Technology-Organisation-Environment framework (Tornatzky & Fleischer, 1990)

Some factors in the TOE contexts would vary depending on the type of technology being studied (Oliveira & Martins, 2011). The TOE framework is aligned with the DOI theoretical model, particularly when considering the technology and organisational contexts but has the added aspect of considering the external perspective, however, this could also be a constraint when considering innovation (Oliveira & Martins, 2011). Therefore, there is an alignment for an emerging and innovative technology like RPA.

### 2.3.2 Technological perspective

As a basis of comparison with very similar technology, there are opposing views on whether BPM fulfilled expectations of improving efficiency through technology automation (Ringim, Razalli, & Hasnan, 2012). RPA research is similarly opposed: some researchers are unsupportive that RPA is able to deliver expected benefits, while other researchers claim that there are more benefits to RPA than cost reduction and efficiencies (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). “RPA washing” is a term being used by some implementation partners for vendors that claim the solution is RPA but fundamentally does not contain all the functionality. This claim results in misalignment of the effectiveness of the technology (Willcocks & Lacity, 2015). Ill-defined processes or processes not fit for automation affect the adoption of RPA when the business requirement is not achieved through automation (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). Perceived benefits, process characteristics and robotic collaboration have been reviewed in more detail in the subsections below.

#### 2.3.2.1 *Perceived benefits*

The expectation of RPA is that value is added to the business by employees being relieved of admin intensive tasks and are able to focus the freed up time on higher-value activities (Vedder & Guynes, 2016; Herbert, Dhayalan, & Scott, 2016). RPA intends to simplify operations and reduce costs, which make a compelling business case for implementing the technology (Dilla & Jaynes, 2015; Davenport & Kirby, 2016), this, in turn, is further motivated by industry promises of return on investment within a year (Lamberton, Brigo, & Hoy, 2017). The challenge seems to be more where the augmentation of effort should start (Stople & Steinsund, 2017).

After the implementation of the RPA host software, integration does not require accessing other systems via application programming interfaces (API), instead the robotic process uses a normal user login to access and enter disparate information into systems of record, reducing the need for long change processes that inhibit delivery (Herbert, Dhayalan, & Scott, 2016). RPA is being used to build a case for AI investments by showing benefit quickly to executives to build credibility for automation (Willcocks, Lacity, & Craig, 2017; Lacity, 2017). Perceptions of the benefits that RPA brings are fuelled by the fact that competitors are implementing RPA (Stople & Steinsund, 2017).

Customer expectations can be better met with processes that use RPA because changes to the system or process can be released faster with automation systems (Davenport & Kirby, 2016). Consistent quality standards can be obtained through automating repeatable tasks, resulting in higher customer satisfaction (Dilla & Jaynes, 2015; Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). Automated services can be made available to customers all day and every day based on the fact that they are hosted on a system as opposed to having to wait for a person to act on a request (Herbert, Dhayalan, & Scott, 2016). Scale can be achieved by automating common cases with RPA so that the cases can be done simultaneously by multiple processes reducing waiting time for customers (Anagnoste, 2017; Varghese, 2017).

#### 2.3.2.2 *Stable or suitable processes*

RPA success is reliant on the process that it is being configured for. Operational efficiency is gained by unambiguous rules with limited exception handling required (Willcocks, Lacity, & Craig, 2015c). RPA is not able to fix ill-defined processes and the automation will fail if processes are not well defined and stable (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). It is difficult to detect

any issues following automation where there is no manual checkpoint as part of designing and rolling out the change, introducing risk to the integrity of the automation (Leopold, van der Aa, & Reijers, 2018). Issues with RPA logic can result in a financial loss that outweighs the gains from automation (Kirchmer, 2017).

#### *2.3.2.3 Robotic collaboration*

Some researchers have claimed that RPA is intended to remove mundane admin tasks and allow for better decisions to be made, especially in financial services, healthcare, and customer programmes (Dilla & Jaynes, 2015). Furthermore, only specific roles or part of roles are being targeted by RPA (Lamberton, Brigo, & Hoy, 2017). However, the true benefit of RPA can be perceived to be its working in harmony with humans, ensuring a better outcome of objectives (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). RPA is unable to process emotion, exercise subjectivity, or be empathetic to customers' needs and is therefore not a replacement for people (Lamberton, Brigo, & Hoy, 2017). It is further argued that RPA is not necessarily only being deployed for menial tasks; in financial institutions, RPA is able to replicate expertise done by professionals. This means that human levels of competencies will need to improve (Stople & Steinsund, 2017). Looking back in history where automation has been deployed in other industries like manufacturing, RPA can be unstoppable and needs to be managed by committing to a change in education and skills (Dilla & Jaynes, 2015).

### **2.3.3 Organisational perspective**

The organisational context in the TOE framework is made up of descriptive measures for organisation scope, size, and management beliefs (Salwani, Marthandan, Norzaidi, & Chong, 2009). Adoption is determined by the internal organisational communication and support for the initiative as well as the organisation's resources and ability to innovate (Dedrick & West, 2003). Some of the significant variables found by testing adoption across other technology adoption studies include organisational resources, structure, slack, knowledge and innovation capability, operational capability, management support, use of technology, and trust (Gangwar, Date, & Raoot, 2014). Common themes in the RPA literature related to change management, executive support, skills, and capabilities and thus are variables which would be classified in the organisational context for organisations that want to use RPA (Lacity, 2017; Lamberton, Brigo, & Hoy, 2017). Executive and management support for RPA projects is commonly cited as the reason that RPA projects are successful and the lack thereof a challenge that results in adoption failure (Ringim, Razalli, & Hasnan, 2012; Stople & Steinsund, 2017). There are common issues relating to delivering an RPA project based on the ownership of the benefits and process which affects adoption (Lamberton, Brigo, & Hoy, 2017). These factors are discussed in more detail in the following subsections.

#### *2.3.3.1 Business-owned and IT-aligned structural approach*

A common theme in RPA cases is that success of the programme is dependent on the business owning and managing the process but also that IT is closely aligned to the activities (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). The reliance on IT in RPA implementations is reduced to the initial set up of the system and creating user accounts, eliminating the often cited constraint caused by IT (Willcocks, Lacity, & Craig, 2015a). However, conflicting research states that the business should only manage the process definition and that IT should be responsible for configuring any changes (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). Caution should be taken where IT over-engineer the delivery methodology with paperwork and approvals as the value is eroded when delivery takes months rather than weeks (Lamberton, Brigo, & Hoy, 2017). RPA

technology options exist in the cloud, making implementations and integrations even easier and faster but this presents the opportunity for the business to provide an RPA service without the support of IT, causing issues further down the line (Willcocks, Lacity, & Craig, 2015d). In other financial cases, organisations have ended up not using cloud services due to legal and compliance concerns regarding their data (Willcocks, Lacity, & Craig, 2017).

#### *2.3.3.2 Skills and capabilities*

Vendors position RPA as an easy to implement and use technology for business users which is true for simple processes, but to use all the capability of RPA effectively, some expert knowledge is required (Kirchmer, 2017). Consulting partners or representation from RPA vendors are used to develop internal capability needed to sustain the implementation of RPA (Rutaganda, Bergstrom, Jayashekar, Jayasinghe, & Ahmed, 2017). In some cases studied, external vendors were brought in initially to help build the capability internally with the intention that by the end of the project, the internal staff would be able to support further implementations (Lacity, 2017). A challenge is that business is able to automate processes with a limited amount of training and being ignorant to considerations that an experienced practitioner would take which can hamper effectiveness (Lamberton, Brigo, & Hoy, 2017). Considering the possible scarcity of skills in needing to perform the business task, RPA is able to mitigate the risk by automating the task (Stople & Steinsund, 2017).

#### *2.3.3.3 Change management*

A significant variable in innovation adoption theory is change management and this is supported in much of the technology adoption cases in the literature (Lacity, 2017). Scepticism about new and innovative technology is often because of past experiences where the change promised more than the technology can deliver to users (Willcocks & Lacity, 2015). In earlier literature, change management was defined as only training users but in RPA cases, change management advocates empowering users by giving them the autonomy to help shape the approach of the implementation (Trkman, 2013). Further developments are recommended to have users involved early on in the process and co-create the change holistically to improve ownership of the initiative (Stople & Steinsund, 2017). This is supported by the early start to enterprise-wide cultural change being key to avoiding resistance to implementing automation projects (Krishnan & Ravindran, 2017).

#### *2.3.3.4 Executive support*

Considering the similarity of BPM and RPA, a lack of sustained executive support, unrealistic scope, and ineffective change management have resulted in 70% of BPM projects to having failed (Ringim, Razalli, & Hasnan, 2012). In RPA cases, executives have misaligned expectations which cause a negative perception of the initiative and impact the financial justification of the programme (Stople & Steinsund, 2017). RPA implementers report that RPA delivered less value when led by middle management with no mandate (Willcocks & Lacity, 2015). A lack of leadership causes management's failure to change (Stople, Steinsund, Iden, & Bygstad, 2017). Project sponsorship at leadership level enables the initiative to gain attention at the C-suite level ensuring maximum traction once implemented (Willcocks, Lacity, & Craig, 2016).

### **2.3.4 Environmental perspective**

The environmental context focuses on factors which influence the industry or organisation that are external to the operations of the organisation. Environmental areas that can impact RPA implementations are industry-based competition, social relationships with customers, government

regulation, and mainstream media. Industry-based competition and social relationships with customers and suppliers are variables considered within this context (Salwani, Marthandan, Norzaidi, & Chong, 2009). Governmental regulation is not considered a significant variable, but external, internal, and trading partner pressures are considered significant (Gangwar, Date, & Raoot, 2014). There is hype in the media creating fear about robots taking over human jobs which impacts the reality of how RPA can create efficiency and affect adoption (Davenport & Kirby, 2016). Opposing views in the literature are aligned through prediction that RPA could be responsible for three to five humans being replaced by a single robot and if RPA continues at the current trajectory in growth, by 2025, one hundred and ten million human jobs could be replaced through automation (Dilla & Jaynes, 2015). The social impact of fear and hype would have an impact on the adoption of RPA in South African banks based on the relationship with the trade unions. Financial use cases need to be aligned with the capability of the technology and be considerate to compliance and regulatory requirements to be effective (Stople & Steinsund, 2017). This is aligned with the commercial dependence variables discussed in the subsection below.

#### 2.3.4.1 *Financial use cases*

Financial services are prime use case candidates for RPA due to the many administrative intensive tasks associated with banks such as opening and closing accounts (Dilla & Jaynes, 2015). Automating Anti Money Laundering (AML) and Know Your Client (KYC) processes is traditionally difficult to integrate into “systems of record” like Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems but RPA can seamlessly integrate into these systems over the front-end (Cahill, 2017). Furthermore, loan decisions made by RPA are deemed to make more appropriate decisions based on fact rather than emotion (Jakšič & Marinč, 2018). Banking regulations require all actions for certain processes to be auditable and electronically produced in the event of a legal case which is satisfied by RPA capabilities (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017; Dilla & Jaynes, 2015). This indicates that RPA can, and likely will, impact the financial services industry (Stople & Steinsund, 2017).

Based on the literature that has been reviewed, several models were deemed appropriate for adoption research. The following section describes the models and frameworks and concludes with the most appropriate for this study.

## 2.4 Research model

Information Technology adoption is globally considered to be a major driver for competitiveness within the economy in a country and it is essential for organisations to remain relevant (Oliveira & Martins, 2011). Innovation adoption is complex and therefore theoretical models and frameworks are essential to understanding the elements of adoption (Oliveira & Martins, 2011). A theoretical model for technology adoption could be made up of innovation theoretical models and contextual frameworks to best explain the process and the factors that affect the different stages of adoption (Hameed, Counsell, & Swift, 2012).

Considering the technology in banking adoption research, systematic literature reviews on technologies for mobile banking, internet banking, and a paper on social influence on technology adoption used a mix of theoretical models. The following theoretical models were included in the studies: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), The Technology Acceptance Model (TAM) (Davis, 1989), TAM2 (Venkatesh & Davis, 2000), Theory of Planned Behaviour (TPB)

(Ajzen, 1985), Innovation of Diffusion Theory/ Diffusion of Innovations (IDT/DOI) (Rogers, 1995), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) Social cognitive theory (SCT) (Bandura, 1989), Commitment-trust theory (CTT) (Morgan & Hunt, 1994), Perceived risk theory (PRT) (Roselius, 1971), Decomposed theory of planned behaviour (DTPB) (Taylor & Todd, 1995).

Different IT adoption models are relevant to organisation-level adoption and at an individual level. For this study, adoption of RPA is at a bank-level and therefore the adoption of theoretical models relevant to organisation levels need to be reviewed. A commonality in The Unified Theory of Acceptance Use of Technology (UTAUT) and the deriving theoretical models is that the technology focus is aimed at the individual level of adoption and not from an organisation perspective. Most organisation-level adoption models are derived from the TOE framework and Innovation of Diffusion Theory/ Diffusion of Innovations (IDT/DOI) model (Oliveira & Martins, 2011).

The TOE framework was selected because it is a well-used framework that has a firm theoretical basis which has been used in IS innovation research extensively. The TOE framework includes the environmental context which is not included in DOI and therefore better explains innovation adoption, particularly within organisations, and is more complete (Oliveira & Martins, 2011).

Based on the literature reviewed the following adaption of the constructs of the TOE framework was developed for the research.

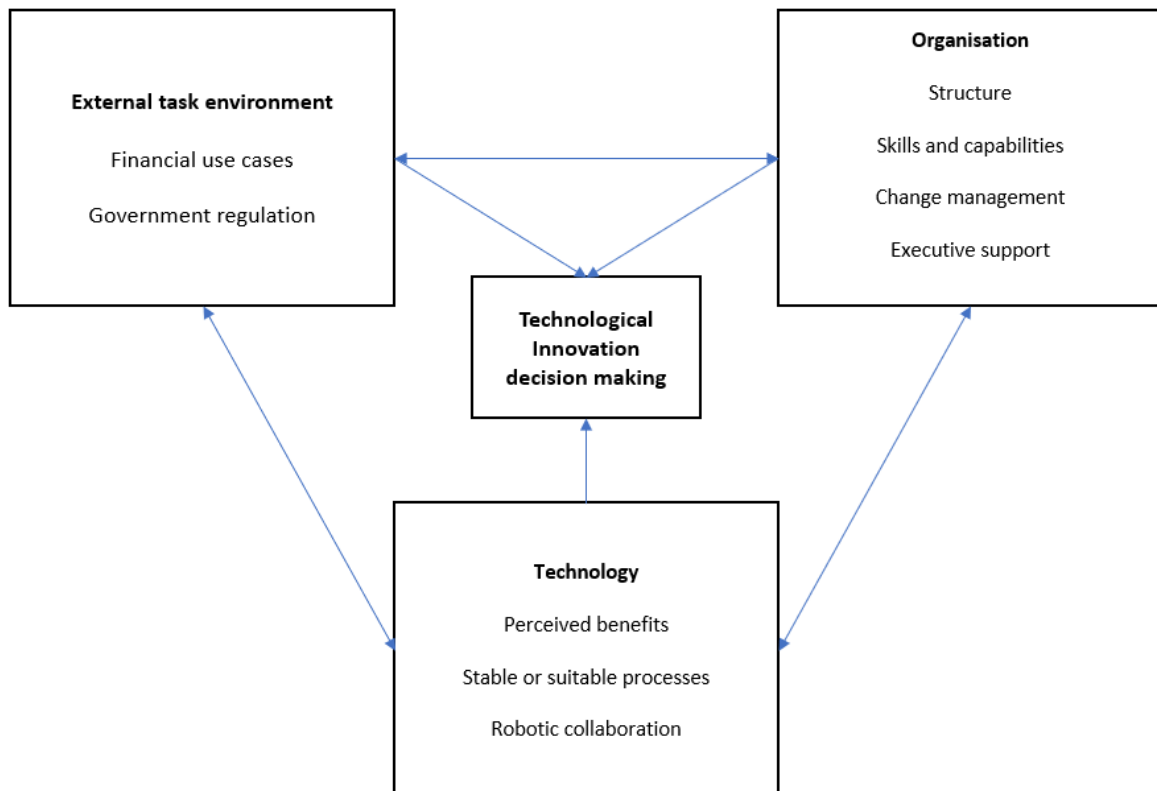


Figure 2- Adapted Technology-Organisation-Environment framework for the adoption of RPA in South African banks (Tornatzky & Fleischer, 1990)

### 2.4.1 Propositions

The propositions for the research are based on the literature reviewed and considering the TOE frameworks are:

- P1.** The factors affecting the adoption and usage of RPA in South African banks will comprise technology, organisation, and environmental factors.
- P2.** Perceived benefits, stable or suitable processes and robotic collaboration are technological factors that affect the implementation and adoption of RPA.
- P3.** Structure, skills, and capabilities change management and executive support are organisational factors that affect the implementation and adoption of RPA.
- P4.** Financial use cases and government regulations will have an impact on the adoption of RPA in South African banks

## 3 Methodology

The research design gives an overview of the approach, guidelines, procedures, and plans that the research followed in order to answer the research questions and achieve the research objective (Myers, 2009). Section 4.1 discusses the research philosophy that was chosen for this research. The sections following detail the research methodology which includes the strategy, purpose, approach, sampling, timeframe, instrument and analysis, ethics, and confidentiality.

### 3.1 Research philosophy

Research philosophies are determined by the researcher's stance on the development of knowledge (Saunders, Lewis, & Thornhill, 2016). This stance guides the crafting of research questions and objectives. There are two main assumptions about the development of knowledge: epistemological assumptions are assumptions about human knowledge and assumptions about the realities in the research are ontological assumptions (Saunders, Lewis, & Thornhill, 2016). These assumptions are discussed in the following subsections.

#### 3.1.1 Ontology

There are two dominant ontological stances: objectivism and subjectivism. Objectivism states that social phenomena are independent of humans, so the informational structures exist and can be captured and measured externally (Bryman & Bell, 2014). Subjectivism presents a view dependent on humans where social reality is constructed by the actions of people (Saunders, Lewis, & Thornhill, 2016). The research intended to subjectively review the literature, guided by the perspectives of the TOE framework and analyse the data gained from the differing perspectives of the candidates in the semi-structured interviews. The participants will have different perceptions of the implementation and the factors that affect the adoption of RPA in the banks which needed to be recognised. Further, most studies in developing countries are influenced by the awareness of technology innovation in developed nations which inhibit the local context to be explored effectively (Avgerou, 2001). Adopting a subjectivist stance for the adoption of RPA in South African banks will allow the relevant context to be explored effectively.

#### 3.1.2 Epistemology

Positivist philosophy assumes the social reality is observable and can be methodically generalised (Saunders, Lewis, & Thornhill, 2016). In positivist research, the literature is initially reviewed to identify an appropriate theoretical model and hypothesis, or propositions are made and then tested

(Collis & Hussey, 2013). Interpretivism is an alternative to positivism since the assumption is that the approach needs to respect the differences between humans and objects (Bryman & Bell, 2014). This study will adopt an interpretivist stance since there will be differing perspectives from the participants in the interviews based on their own experiences and this could be different workplace realities. If the research only focuses on the commonality between the participants then the richness of the data obtained from the interviews will not be recognised (Saunders, Lewis, & Thornhill, 2016). The complexity in organisations are not confined to different roles in the organisation alone but include different backgrounds and perspectives which define a possibly different context (Saunders, Lewis, & Thornhill, 2016). Considering the different roles and people affected by an RPA implementation and how that could affect adoption, the interpretation of the participants is important to include as part of this research.

### 3.2 Research strategy

A qualitative approach is appropriate for this research because it aims to discover the context and background of the factors that affect the adoption of RPA in South African banks. Qualitative data allows the subject to be explored in the closest to the real setting resulting in rich and complete data (Saunders, Lewis, & Thornhill, 2016). Semi-structured interview questions guided by the TOE framework and Institution Theory formed the basis of the interviews to gain knowledge but the participants were encouraged to express themselves, which led to gaining deeper context of the impact when RPA was adopted in the bank (Saunders, Lewis, & Thornhill, 2016). Semi-structured questioning can be flexible so that questions can be re-ordered or adjusted depending on how the interview flows which allows for richer appropriation of data (Saunders, Lewis, & Thornhill, 2016). This meant that the participants could delve into factors that were particularly appropriate in their environment. In-depth and semi-structured interviews can be used in explorative studies because they discover context and background to the material that is being studied (Saunders, Lewis, & Thornhill, 2016).

### 3.3 Purpose of research

The purpose of research can be categorised into three groups depending on the outcome that the researcher is trying to achieve: explore a new phenomenon, describe a social phenomenon or explain why something occurs (Neuman, 1994). Exploratory research is flexible and can adapt to changes during the research and can bring additional insights to the body of knowledge on the phenomenon (Saunders, Lewis, & Thornhill, 2016). The purpose of the research was to explore the research gap in the adoption of RPA in South African banks, a new phenomenon, and understand the use cases that are being used and is therefore exploratory. RPA is a new technology that requires analysis and investigation to assess new phenomena which are characteristically exploratory (Bhattacharjee, 2012).

### 3.4 Research approach

There are two main approaches to research: inductive and deductive. Inductive approaches assert that new theory is built from detailed observations of the world for generalisation which was not the intention of this study (Neuman, 1994). Deductive approaches recognise established theoretical models and frameworks and move towards proving them with empirical evidence (Cavana, Delahaye, & Sekaran, 2001). Deductive research is best suited to this research because many adoption models and frameworks exist in the literature and have been tested to be appropriate for the technology

adoption phenomenon (Neuman, 1994). This study used the TOE framework and Institution theory as a guide to organising the adoption factors by the perspectives of the TOE framework and thus the constructs of the framework were not intended to be tested or validated.

### 3.5 Population and sampling

The research instrument is semi-structured interviews and the target population are people working with RPA within South African banks. The target population has been identified by organisations from the Banking Association of South Africa (<http://www.banking.org.za/about-us/member-banks>) and then further defined by banks that have implemented RPA in their organisations. Major RPA vendors reference their clients on their websites which were used to determine the final targets (Le Clair, Cullen, & King, 2017). The combination of the banks defined by the association and the listed clients by the RPA vendors focussed the target population based on the research question. The sample was purposively determined by the research question and objectives and was intended to be useful, credible and appropriate for the research (Patton, 2002). The participants are a sample of employees at Banks where RPA has been implemented in South Africa and have been listed in table 2 below.

Role	Expertise	Context
<b>Bank executives</b>	Business unit process owners	Domain
<b>Business analysts</b>	Business process mapping to technology	Technology
<b>Programme managers</b>	RPA programme delivery and change management	Technology

*Table 1 - Target list of participants*

Purposive sampling is not considered representative of the population but does provide rich context due to carefully selected and appropriate cases which in this case is from appropriate banks that have implemented RPA (Patton, 2002). Executives representing the business need for RPA were identified for their perspectives of the environmental context of RPA adoption, in terms of a better understanding of why banks were making the decision to implement RPA. Business Analysts were deemed important for their perspectives on the process element of RPA and programme managers for the delivery perspective of the technology into the banks. These three groups of participants would represent the technology, organisation, and environment contexts of the organisation. Homogenous sampling focusses on a subgroup where the sample is comparable which allows more depth to be explored and variances made more obvious and this is relevant since the sample is confined to South African banks (Saunders, Lewis, & Thornhill, 2016). A social media platform, Linked-in (<http://www.linkedin.com>), was used to search for participants based on bank and role search criteria. The interview was piloted with a purposive sample for the reliability of the interview questions and the time needed for the interview (Neuman, 1994).

### 3.6 Research Timeframe

The timeframe for the research project is cross-sectional. The research was conducted in the banking sector at a particular point in time which would mean that the outcomes are relevant for that point in time and do not consider how the subject evolves over the period of time (Saunders, Lewis, & Thornhill, 2016). This is appropriate considering the timeframe within the Master's programme needs to be completed. The timeframe for this research is from August 2018 to August 2019.

### 3.7 Research Instrument

The research instruments were based on the research philosophy and strategy that was chosen for this study. The following sub-sections describe the instruments chosen for the research.

#### 3.7.1 Semi-structured interviews

Open-ended questions were prepared by considering the TOE framework and used in semi-structured interviews. The questions were derived from the literature where other research has been conducted on similar technology adoption in the banking industry. The TOE framework defines categorisation relevant to the adoption perspectives and has been used to organise the data collected from the questions in the interview process. The interviews allowed the participant to share additional context by following an unstructured approach for part of the interview that would not occur in structured interviews (Saunders, Lewis, & Thornhill, 2016). Sub-questions have been added to some of the questions to prompt exploration of deeper context based on the main question asked; the questions have been presented in Appendix A. Two questions were asked to determine the maturity of the RPA implementation at the participants' employers which was used to contextualise the information from the participant.

#### 3.7.2 Reliability and validity

There are different types of measurements for validity including face validity, construct validity, content validity and predictive validity (Saunders, Lewis, & Thornhill, 2016). No objective measurement of validity exists (Bhattacharjee, 2012). In positivistic research where quantitative measures are used in the research instrument, the reliability of results can be measured (Saunders, Lewis, & Thornhill, 2016). Reliability and validity need to also be taken into consideration for qualitative research (Patton, 2002). Reliability and validity can be determined by trustworthiness in a qualitative study (Bashir, Muhammad Tanveer, & Azeem, 2008). Trustworthiness can be considered by employing the following strategies: credibility, generalisability, dependability, and confirmability (Krefting, 1991). The purposive sampling of the population ensured that the participants were credible in their field of expertise, in turn ensuring that the source of interview data was credible. Pilot testing was done by using a first draft set of questions being tested in a sample interview so that the data could be analysed to ensure alignment with expected data retrieved and to baseline the length of the interview. This helped manage expectations with the future participants but also ensured focus on the most relevant questions and output (Bryman & Bell, 2014). The research methods, data collection, analysis, and findings have been detailed to ensure that the approach can be repeated in future research. The interview data from participants were triangulated with other participants' data when developing the themes and any outliers have been stated. Using the TOE framework as a guide but adding Institution theory to environmental perspective to strengthen the perspective has improved the credibility of the results with deeper consideration of the phenomenon. Lastly, the interview data findings have been triangulated with the literature to corroborate findings and list any new findings to add generalisability of future studies.

### 3.8 Data collection

Data collection occurred following the development of the research instrument and gaining approval from the UCT Ethics Committee. The interviews were mostly face-to-face with the participants so that it was possible to read more deeply about responses through facial expressions and body language. Where not practical, video link was used as a substitute to face-to-face interviews

(Saunders, Lewis, & Thornhill, 2016). At least eighty per cent of the listed semi-structured questions were answered so that a completed response is managed within an interview. Where this was not possible, follow up questions were sent via email (Saunders, Lewis, & Thornhill, 2016). The participant was asked to grant permission to record the interview and following the interview, the recording was transcribed to text. The text version was then shared with the participant to ensure accuracy and that any confidential data was not being unintentionally shared (Saunders, Lewis, & Thornhill, 2016).

### 3.9 Data analysis technique

The six steps of thematic analysis were used to guide the approach to establish themes and group data by themes (Fereday & Muir-Cochrane, 2008). The six steps of thematic analysis are described in the table below:

Phase	Action	Description of process
1	Familiarising yourself with the data	Transcribing data (if necessary), reading and re-reading the data, noting down the initial ideas.
2	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating relevant data to each code.
3	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4	Reviewing themes and relationships	Checking if the themes work in relation to coded extracts and entire dataset.
5	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells.
6	Producing the report	Selection of vivid, compelling extract examples, analysis of selected extracts, relating back the analysis to the research question and literature.

Table 2 - Six Phases of the thematic analysis (Braun & Clarke, 2006, p. 87)

#### 3.9.1 Data familiarisation

The qualitative data resulting from the interviews contained patterns and commonality between participants, these were established in phase one of the process. The process of transcription and reading the data repeatedly for error handling provided an opportunity to start collecting initial ideas.

Computer Assisted Qualitative Data Analysis Software (CAQDAS) was used to organise and analyse the interview data. The computer-assisted software helps to improve the ability to identify relationships in the data which ultimately improves the rigour of the analysis (Lewins & Silver, 2009). NVIVO is available from the University of Cape Town (UCT) information and communication technology services division.

### 3.9.2 Generating initial codes

The initial codes were deductively produced as the TOE framework was used to develop the questionnaire. This resulted in some of the answers already aligned to the perspectives of the framework. In some instances, open ended questions resulted in long conversational answers which answered later planned questions. These extracts were then coded with the pre-determined codes. Some additional codes emerged in later interviews as participants unexpectedly shared details about their interactions with trade unions.

### 3.9.3 Searching for and reviewing themes

Themes were identified by grouping the codes more closely to the research questions and research frameworks (Braun & Clarke, 2006). Codes that were describing the same thing were collapsed into a single, more descriptive code and then grouped according to the perspectives of the TOE framework, where Institution theory formed part of the Environmental perspective (Saunders, Lewis, & Thornhill, 2016). Some initial codes were discarded where there was no sufficient comparative data in the dataset and the code proved insignificant in the context of the research.

### 3.9.4 Defining and naming themes

The themes were classified by relating them back to the research questions (Braun & Clarke, 2006). Codes that emerged from the analysis were grouped with common codes, for example “union relationship” was renamed to “Social relationships” and social relationships was then a theme moved under the main Environmental theme. Themes were then aggregated as sub-themes into the main themes to complete alignment to the TOE framework and the literature review. Appendix B details the themes, sub-themes and related codes within NVIVO for reference.

### 3.9.5 Producing the report

The report was produced by reviewing each main theme in detail and extracting the most appropriate references from participants so that a coherent account of the interview data is related back to the literature and answers the research questions (Braun & Clarke, 2006). The report has been shared as part of chapter 5.

## 3.10 Ethics and Confidentiality

An application was approved by the UCT Ethics Committee as part of this submission and following the received approval, the formal interviewing of the target sample commenced. Each interview was preceded by an email detailing the purpose of the research and a copy of the signed ethics permission form which included the researcher and supervisors’ signatures. A copy of the consent form can be found in the appendix. Candidates were informed that the research was voluntary and were requested to sign the ethics form which has been retained for the final dissertation submission. The signed forms contain the details of the participants and to protect the identity of the participants these will only be available on request.

All participants’ names and organisations have been kept anonymous but demographic information observed has been used for more fine-grained analysis of the responses. Transcriptions, notes, and minutes were shared with each participant to ensure that the account of events is accurate and does not violate any privacy agreements. All identifiable information in the transcripts has been omitted. Privacy and anonymity were guaranteed to the participants. The original transcripts and recordings will not be submitted to protect the anonymity of the participants. Participants were clear that not

all questions needed to be answered and that the interviews were recorded for transcription purposes. The data was also stored on secured and encrypted media and is sufficiently backed up and in the sole possession of the researcher.

### **3.11 Limitations**

The sample of the research was based on employees that worked at the major banks in South Africa. The qualitative nature of the research resulted in rich information being gathered from participants to understand the factors that drive adoption in the banks and the effect of adopting RPA. The sample is not necessarily representative and should not be used for generalising the findings.

The literature searches resulted in limited research conducted on RPA and therefore there is a lack of generalisability of the technology available. This was a motivation for the qualitative approach taken, to ensure that the phenomenon could be explored in depth.

In addition, the research timeframe was cross-sectional and therefore based on a point in time and thus the current situation may change over time.

## 4 Research analysis and interpretation

### 4.1 Introduction

The previous chapter covered the research design and methodology. This chapter focusses on the findings of the study and discusses these in the context of the research. The findings relate to the output of the thematic analysis that was conducted on the transcriptions documented through the interview process. A total of twelve participants partook in the interviews. Participants K and L attended the same interview and covered different parts of the questions.

Section 5.2 analyses the demographics of the participants. Section 5.3 describes the approach and outcomes of the thematic analysis including the emergence of the themes. Sections 5.4, 5.5 and 5.6 present the findings from the Technology, Organisation and Environment perspective respectively. 5.7 summarises the chapter.

### 4.2 Participant demographics

Interviews were conducted with experienced people working in South African banks. The roles of the participants ranged from business and IT executives responsible for function areas to RPA programme delivery heads to business analysts involved in RPA programmes. The table below summarises the demographics of the participants.

Code	Role	Total Bank Employees	RPA Maturity	Domain	Experience	Education	Gender
A	Bank Executive	10 000+	Scaling	Business	19 years	BCom Acc (Hon)	Male
B	Head of RPA COE	10 000+	Redefining & scaling	IT	14 years	MBA   BSc Eng	Male
C	Business Analyst	1001-5000	Scaling	IT	5 years	BCom IS (Hons)	Male
D	Head of RPA programme	10 000+	Redefining & scaling	Business	14 years	Unknown	Male
E	Head of RPA programme	1001-5000	Redefining	Business	15 years	MBA   BCom Marketing (Hons)	Male
F	Head of Robotics	10 000+	Scaling	IT	19 years	MBL   PG Dip IT	Female
G	Business Change Manager	1001-5000	Starting point	IT	23 years	BCom Acc	Male
H	Business Analyst	1001-5000	Starting point	IT	15 years	BCom IS (Hons)	Female
I	Head of Intelligent Automation	10 000+	Scaling	IT	25 years	MBA	Male
J	RPA Programme Manager	10 000+	Redefining	IT	11 years	BCom HR	Male
K	Head of RPA	10 000+	Redefining	IT	16 years	BTech Marketing	Male
L	Bank Executive	10 000+	Redefining	IT	38 years	BCom Marketing	Male

Table 3 - Participant demographics

The executives provided a more holistic view of the business impact on the bank compared to participants involved at a programme level who focussed more on the implementation of the technology. All the participants worked in banks that have more than a thousand employees and

most worked in banks with more than ten thousand employees. The participants were asked at which stage their RPA implementation was at in order to determine the implementation maturity. The options were: starting, work in progress, redefining or scaling. Ten out of twelve of the participants were involved in organisations that were either redefining or scaling the RPA capability in the bank and none of the participants cited their implementations to be a work in progress. The literature refers to the collaboration of the business stakeholders and IT stakeholders in 2.3.3.1 and posits that RPA should be business owned and IT aligned. The area of the business the participants work within has been noted and although these include both business and IT stakeholders, the majority were leaders based in the IT department. The average experience of the sample group was seventeen years and nine months. The most experienced participant had 38 years of experience and the least experienced participant had five years of experience. All known participants held qualifications at a tertiary level and three of the participants were educated at Master's level. Most participants were males which was not intentional.

### 4.3 Thematic analysis

The research analysis was conducted using thematic analysis. The six phases of thematic analysis resulted in codes being created and then aggregated into themes (Braun & Clarke, 2006). Table 5 represents an example of codes created for Participant A with the participant's responses as examples of the types of references that were coded.

Codes	References	Example reference
<b>Industry influence</b>	2	"I don't think that the bank has ever had the view because of the other banks"
<b>Social relationships</b>	3	"Currently we work very closely with the unions"
<b>Change management</b>	2	"I think the biggest one was change management."
<b>Executive support</b>	2	"The management is involved on a weekly\monthly basis."
<b>Skills and capabilities</b>	3	"[...] at the moment, it is very much outsourced to companies where we moving to get the development inhouse."
<b>Structure</b>	5	"It is a shared responsibility, so it is a collection where we have standards, software and vendor management sit in IT, and then basically the identification, the build, support and maintenance sit in the business itself."
<b>Trust</b>	1	"I think at first they were very hesitant to do something like that because a lot of times when you want to automate things people think that they will be out of a job"

Table 4 - Example of associated codes developed for Participant A with number of coded references

The number of codes and total references for the dataset is listed in table 6 below.

Participant	Codes	References
<b>Participant A</b>	22	123
<b>Participant B</b>	30	153
<b>Participant C</b>	21	72
<b>Participant D</b>	25	106
<b>Participant E</b>	24	114
<b>Participant F</b>	24	106
<b>Participant G</b>	25	95
<b>Participant H</b>	15	32
<b>Participant I</b>	30	235
<b>Participant J</b>	24	105
<b>Participant K + L</b>	22	133

Table 5 - Number of codes and references per participant

Codes that were similar in description were collapsed into single codes and renamed to provide a more general description. The codes were grouped, defined and themed using the TOE framework as a guide (Braun & Clarke, 2006). The research did not set out to prove, extend or disprove the framework but rather to structure and organise the research data using the framework as a guide.

The main themes and sub-themes that emerged are listed in table 7.

Theme/Sub-theme	Sources	References
<b>Technology Perspective</b>	11	185
Perceived benefits	11	152
Challenges	10	24
Indirect benefits	2	7
<b>Organisational Perspective</b>	11	232
Change management	11	48
Executive support	8	19
Skills and capabilities	10	42
Structure	11	62
Trust	8	24
Use of technology	10	37
<b>Environment Perspective</b>	11	70
Government	9	32
Industry influence	8	14
Media	1	1
Social relationships	8	23
<b>Future use</b>	8	16
<b>Maturity</b>	10	24

Table 6 - Main themes and sub-themes defined by the number of sources and references

The organisational perspective was the most referenced perspective and is the dominant theme in the research. Perceived benefits were the sub-theme most referenced and was a common discussion point given that RPA is an emerging technology.

The sample size was determined by the criterion saturation. This is the point at which no new data is likely to be obtained based on recurring themes (Thompson & Walker, 1998). Theme saturation point occurred after the seventh interview onwards. No new themes emerged from the following

interviews. Qualitative research samples are purposed for depth and detail of the phenomenon and not based on the quantification of the results (Miles & Huberman, 1994). At this point, the data collection process ended.

The sixth stage of thematic analysis is producing the report. The report includes a selection of the compelling extract examples that are then related back to the research question and literature (Braun & Clarke, 2006). The following sections contain the report that has been segmented using the perspectives of the TOE framework.

#### 4.4 Technology perspective

Three main themes were identified as part of the technology perspective. Perceived benefits were the most significant theme followed by the challenges that banks are facing from a technology perspective when adopting RPA. The technology themes in table 8 show the themes and sub-themes by sources and references.

Sub-themes	Sources	References
<b>Technology Perspective</b>	<b>11</b>	<b>185</b>
Perceived benefits	11	152
Challenges	11	69
Indirect benefits	2	7

Table 7 - Sub-themes in the technology perspective by sources and references

Each theme is made up of sub-themes that outline the extent to which these themes emerged in the research. These have been broken down in the following sub-section.

##### 4.4.1 Perceived benefits

The perceived benefits are tabled in table 9 below and show that the benefits that had the most significance in the interviews were the admin reduction and simple implementation. This does not necessarily mean that the magnitude of the benefit was weighted by the number of references but would indicate the commonality of the benefit. The benefits of RPA were therefore confirmed by the participants and congruent to what was referenced in the literature.

Sub-theme	Sources	References
<b>Perceived benefits</b>	<b>11</b>	<b>152</b>
Simple implementation	10	44
Admin reduction	10	36
Reduced costs	8	28
Consistent quality	8	19
Scale based on demand	5	15
24/7 service availability	5	9

Table 8 - Perceived benefits sub-themes by sources and references

##### 4.4.1.1 Simple implementation

RPA requires an initial build and configuration of the infrastructure to enable the development of automated processes. The initial build and configuration are complex.

*"[...] you have to be very clear on the tool that you buy, it is not just taking out of the package, unwrap it and use it." – Participant I*

Banks have to create digital employee accounts that the bot will use to execute the automated tasks. This has been a challenge for traditional account creation processes.

*“Now I have got a robot, how do I create that employee number for employment without someone having to pay tax?” – Participant E*

The benefit of RPA is that once the underlying infrastructure is built, there is less reliance on constrained IT departments to help develop and release the automated bot.

*“[...] when you bring in technology like RPA or bringing any other technology [like] a lot of organisations we have IT constraints and there is only so much that we can do.” – Participant L*

*“[...] the benefit of RPA essentially [is], I don’t need a long development cycle of an IT development where I don’t have to go through x number of releases.” – Participant E*

Making changes to automated processes is faster than it would be changing traditional banking systems.

*“It takes us an hour, two hours, three hours, sometimes maybe a day or 2 days to re-jig it, re-code and get the robot running and then we overcome that.” – Participant I*

Automating the processes using RPA systems is intuitive for business analysts to build, although efficient and stable automation tasks require experience with the tool.

*“[...] the UI is quite intuitive so if you a logically minded person and you come from process reengineering or business analysis background you could very easily grasp the concepts and how to actually model in Blue Prism” – Participant B*

*“[...] anyone can do it but the difference between doing and doing it well; there is a difference between cheap and dirty and autonomous and reliable.” – Participant D*

RPA accesses the systems that it interacts with in the same manner as a human would which negates the requirement for backend integration. This is particularly beneficial for the integration of legacy systems into a process.

*“[...] it is very powerful as an integration point, particularly with the new tech to old tech.” – Participant D*

*“[...] maybe the way I should say this is our RPA bots actually perform like a human being does, it doesn’t integrate with the system.” – Participant F*

#### 4.4.1.2 Admin reduction

Banks are reducing the time spent on admin tasks using RPA, allowing staff to work on more engaging tasks and improving customer response times.

*“[...] where the customer questions the debit order, we used to have a team of 60 call agents that used to focus on that every day, we do about 4500 per day. The average time was about 20 mins per dispute and it is now down to 1.5 minutes [...]” – Participant A*

*"[...] there is also a process where you automate something typically that has no real FTE saving but there is throughput benefit, so I am going to get to my customer quicker."* –

**Participant E**

Checks are done on the tasks that RPA performs but the workforce needed to carry the traditional task is reduced.

*"You still have that level of management overlay but you don't have the actual people on the floor doing work."* – **Participant A**

Automated administrative tasks are also logged and recorded, creating efficiency in auditing.

*"It can show you the governance over the process as it is electronically executed in the middle. And that can fundamentally reduce your need for substantive procedures in audit."* –

**Participant D**

#### 4.4.1.3 Reduced costs

Banks measure efficiency by the cost-to-income ratio which has been improved since RPA has been adopted.

*"The first piece of the puzzle to start driving efficiency and ultimately hope that will lead to cost-income ratio improvements."* – **Participant B**

*"[...] there is a breakeven point, so for example for the past year we made our cost-to-income ratio was 44%. So, implementation vs. benefit is sitting at 44%."* – **Participant A**

Using RPA to integrate two systems is far more cost-efficient than having to develop the integration as part of a systems project.

*"[...] the integration between two systems, it's a two- or three-year project that's going to cost tons of money. Here is something that you can implement and for a small amount of money."*

**Participant I**

Banks are seeing cost savings by automating tasks, which reduces the time to complete but is also measured by the cost per minute to complete the task.

*"[...] if you take a new approach, just say that it can take a human a minute to do this at a cost of say R3 a minute and the bot basically does it at the same cost for 5 cents a minute there is no brainer in terms of efficiency."* – **Participant L**

*"Potentially, just from a back-office perspective we have probably, in three years, we have probably saved about 7 million Rands."* – **Participant J**

The cost savings are not normally achieved from a headcount reduction.

*"It's very difficult to actually realize that money because we have spoken about it a lot of times, you can't just go take people out of the process."* – **Participant I**

#### 4.4.1.4 Consistent quality

Repetitive tasks that are automated produce a predictable and consistent outcome which is what motivates banks to use RPA.

*"[...] that's absolutely the value, you can get scale, you can get digital compliance, you can get operational risk mitigation, you can get efficiency."* – **Participant D**

*"[...] if my process is a 100% accurate it's going to do exactly the same thing day in and day out so from the risk and compliance point of view there is going to be no risk in users."* – **Participant E**

Reconciliation processes that require accuracy for reporting are reliable when automated with RPA.

*"[...] a lot of recon-type processes, some processes that require to be a hundred per cent reliable, always the same input and the same output, no human error."* – **Participant B**

Automation results in consistent handling of data which mitigates the risk that data is entered in different formats by different users.

*"[...] from a data integrity perspective that's almost 100% now."* – **Participant J**

#### 4.4.1.5 Scale based on demand

Banks are using RPA to augment teams during busy periods, to create capacity and complete tasks on time. The need to hire additional staff who are only needed for these periods reduces costs for the bank.

*"Most financial institutions consume audit resources at particular periods of the year and the rest of the year those resources, between you and me, run the risk of being idle. Through the use of RPA, you can keep those resources busy throughout the whole year and you can load balance."* – **Participant D**

*"[...] you have actually got now enough capacity at month-end because usually you were under capacity at month-end but in the middle of the month you were overcapacity."* – **Participant I**

The use cases designed to scale need to be appropriately measured for the demand that they solve to ensure that the benefit can be appropriately realised.

*"[...] what you may just find is that whilst you can write an RPA solution and you can scale it to do 60 000 processes in an hour, you only receive 600 cases an hour."* – **Participant D**

#### 4.4.1.6 Twenty-four seven service availability

Banks are automating some customer requests which limits the requirement for customers to have to contact the bank and request documentation.

*"I think that when the customer actually just sends an email or an SMS or a WhatsApp and actually gets the feedback."* – **Participant A**

*"[...] they were never doing the debit order reversal in twenty-four hours but now with the bot augmenting that workforce, they are actually making the SLA."* – **Participant B**

*“[...] automation means the RPA process can run if we had to, 24 hours a day and it will complete the work; whereas with people there will be limitation in their capacity and the time of the work spent.” – Participant F*

In one instance, a bank is using RPA to query an external system that is less constrained out of business hours to complete checks.

*“We schedule our bots to do your Home Affairs checks, that website is always busy during the day but from 6 o'clock at night to 6 o'clock in the morning its highly efficient.” – Participant K*

Although RPA can run 24 hours a day, the banks' systems that RPA interacts with are not available all the time, limiting the benefit gained.

*“It's sold as a 24-hour system, I just think the underlying systems sometimes can't support twenty-four-seven but it's there if you have the capability. The other thing when talking about twenty-four seven these robots are still machines, they are still electronics and stuff like that, they do go down.” – Participant I*

#### 4.4.2 Challenges

The most referenced themes found in the technology challenges of RPA adoption are application support and stable or suitable processes. This is tabulated in table 10 by sources and references.

Sub-theme	Sources	References
<b>Challenges</b>	<b>11</b>	<b>73</b>
Stable or suitable processes	9	23
Application support	9	22
IT security	6	19

*Table 9 - Challenges sub-themes by sources and references*

There is corroboration in the literature review that stable or suitable processes impacted the effectiveness of RPA. The success of automation relies on the processes being automated to be well defined (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). This is prevalent in the feedback received from the participants.

Application support was also referenced by the majority of the participants. This theme emerged from the data gathered during the interviews to have an impact on the effectiveness of RPA in banks. This technological theme is related to the theme of organisational structure because of the dependency of the business owning and managing RPA (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017).

IT security emerged as a technology challenge and was isolated from the organisational trust theme because of the impact security has on the technology perspective. The literature refers generically to the importance of alignment with IT (Willcocks, Lacity, & Craig, 2015a) but does not reference the importance in a banking context that was shared by the participants.

##### 4.4.2.1 Stable or suitable processes

Banks are conducting an analysis of processes that are suitable for automation using software tools while some are analysing the processes with business analysts or processes engineers.

*"[...] basically, it lies the top of your desktop, laptop or your mobile and it tracks all the activity that you perform during the day."* – **Participant A**

*"[...] at the start of our process, where we do our analysis, we put a process engineer on the existing process and look at it and determine whether it is a bad process and whether we can get efficiency by using a bot."* – **Participant L**

Processes that are deemed not suitable for RPA are not automated.

*"[...] we have taken the approach where we will never roboticize a bad process."* – **Participant K**

*"That's why we first look at the process properly and say this doesn't make sense to automate it."* – **Participant I**

In some cases, RPA is used to string tasks together to gain a fast outcome rather than changing the processes to suit automation.

*"I am not saying automate a broken process but if a process works A to B, then why do I need to go and LEAN Six Sigma it because the business case is how quickly can I automate this process."* – **Participant I**

*"[...] majority of the time broken processes came with manual interventions; manual interventions have to break the process, so we actually build separate robots for each process."* – **Participant J**

Suitable processes can handle exceptions in the processes and report on issues that the process encountered during execution.

*"[...] a decent process is one that is configured in a way that it can cater for any exception on your underlying application and finish safely but report whether it was a business exception."* – **Participant D**

#### 4.4.2.2 Application support

A change in the systems that RPA interacts with will impact the success of the automated process completing.

*"[...] everything around it can change, someone could change something, a field could change, access could change forever and that's also a learning as well."* – **Participant B**

*"[...] it is using the user interface, don't be remiss and forget that every time the core system goes through an upgrade, there is a strong chance that you need to refresh your plaster."* – **Participant D**

Supporting automated processes can be complex when the automation code does not conform to standards that are understood by the support teams.

*"[...] if you build complex code that nobody can understand it becomes very difficult for the maintenance developer that's on standby at 2 am to be able to fix that."* – **Participant K**

#### 4.4.2.3 IT Security

IT security was shared as the biggest factor to solve when implementing RPA in the banks because of the risks that RPA could introduce to the bank’s systems.

*“That’s obviously one of the biggest factors to overcome, specifically in the bank space; convincing the infosec guys that your bots are not going to go rogue.” – Participant B*

Restricting each bot to the same access rights as a user would have has resulted in the security teams accepting RPA into the ecosystem.

*“[...] focus has just been around the security of accessing our systems, doing the work, ensuring that it complies with the standards that we currently have for people today and then it doesn’t open us up to any form of cyber-attack.” – Participant F*

*“[...] from a security perspective we want the audit trail, but we have also embarked on how we give these digital employees’ rights.” – Participant G*

In one instance, a licensing breach was picked up by a vendor supplying a per-user access license.

*“[...] this service provider actually went and said we were breaching our license because we were actually then sharing a license using robots.” – Participant H*

#### 4.4.3 Indirect benefits

Indirect benefits were discovered from two of the participants as shown in table 11.

Sub-theme	Sources	References
Indirect benefits	2	7

Table 10 - Indirect benefits sources and references

The indirect benefit of RPA on AI adoption is referenced in the literature and are therefore confirmed in the interview data (Willcocks, Lacity, & Craig, 2017; Lacity, 2017). The literature refers to RPA creating credibility with executives to embark on AI technology and deviates from the interview data which is aligned to integrating with future AI cases. An outlier in terms of the literature and not common in the interviews is the indirect benefit of systems availability.

RPA creates the opportunity for Artificial Intelligence (AI) solutions to leverage RPA to carry out resultant tasks based on the outcome of a machine learning model.

*“[...] my aim for the bank is to try and use machine learning and deep learning in terms of customer behaviour to trigger a robot when you walk into a branch and we will facilitate your request via an RPA solution.” – Participant A*

Teams are using RPA to consistently run processes that affect user efficiency and ensure that systems are available to users before they report any issues.

*“[...] because a robot logs every single thing it does, the tracking and the monitoring of the process has been substantial and we have even seen now that if one of the underlying systems go down the first thing people come and ask is, the IT support guys, is the robot having problems.” – Participant I*

## 4.5 Organisation perspective

The organisation perspective dominated the research by the number of total references and therefore would be the most significant perspective for RPA adoption. The organisation context contained common themes in the literature related to structure, change management, executive support, skills and capabilities. Use of technology and trust were deemed to be significant from a technology adoption framework perspective in other technology adoption research as can be seen in table 12.

Sub-theme	Sources	References
<b>Organisation perspective</b>	<b>11</b>	<b>232</b>
Structure	11	62
Change management	11	48
Use of technology	10	44
Skills and capabilities	10	42
Executive support	8	19
Trust	5	15

Table 11 - Sub-themes in the organisation perspective by sources and references

These themes were identified in the interview data and aligned with what was found in the literature. The following subsection discusses the sub-themes in more detail.

### 4.5.1 Structure

Most of the banks that used a consulting partner and used Blue Prism, used their recommended framework which is to establish a COE.

*“That’s what’s nice about Blue Prism, they actually advocate that and that’s a good way to actually do it because with Blue Prism it’s not your traditional software tools in the sense that a business analyst gets into the detail and the logic, they could actually develop a bot and it could become Blue Prism certified.” – Participant B*

*“Blue Prism have got this control room concept, but everyone within RPA is all in one team, so you have got your application support person, you have got your infrastructure people, your desktop support; it’s one team with analysts and developers, so it’s one settled team. Whether it’s in IT or in business it doesn’t matter but it’s one team.” – Participant G*

There was only one bank that had not established a COE and this bank was the least mature in terms of adopting RPA of all the participants, based on the question answered in terms of their relative position of RPA adoption.

*“[...] because it’s a proof of concept still, I feel this is part of the problem now; our foot is half in it and we are not prepared to commit, so we are not prepared to say this is working let’s go.” – Participant H*

The COE is weighted more from an IT perspective but is consultative to the business to ensure that there is collaboration in building the solution. IT owns the infrastructure, and run-time can be shared between business units across a 24-hour cycle.

*“[...] IT and the Center of Excellence were almost dictating things while they collaboratively work with business.” – Participant C*

*“[...] you need a committee that runs across that and it needs to have the representation of both business parties and technology parties, and they need to have a common understanding strategy and an appreciation because you can in a federated model.” – Participant D*

*“[...] the business unit will never own a ‘bot. What they do is they buy ‘bot usage time, so if your process needs to run 12hours/day I will schedule you for 12 hours/day and I will only charge you for 12 hours.” – Participant K*

Business analysts and developers from IT form part of the COE.

*“[...] we have got a Robotics Center of Excellence that’s staffed with the right number of business analysts and the right number of developers.” – Participant E*

Business stakeholders are responsible for prioritising and selecting the processes that RPA programmes need to focus on and ultimately be accountable for the outcome.

*“[...] businesses are the ones driving their strategies and agendas; businesses are the ones who should be prioritizing, and businesses should be the ones in a position to choose how to use the capacity and the resource. If they are centrally located, it does add extra layers of complexity.” – Participant D*

*“[...] it’s about the business taking the ownership of the process being automated.” – Participant E*

*“When I read about RPA, they said its business-led, that’s so true.” – Participant I*

IT’s dominance is prevalent for when the COE is established so that RPA, as a technology, establishes standards, governance and frameworks to collaborate in the technology ecosystem. This is aligned with the literature reference to IT owning configuration tasks and the business responsibility for process ownership (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017).

*“Historically most programs have begun on the Center of Excellence sitting in an IT structure that is necessary because when you establish these programs you need to establish technical governance, you need to establish infrastructure frameworks, standards and patterns.” – Participant D*

*“Obviously we have put the infrastructure in place, we have got the rules and guard rails, if you want to implement it in a platform you need to comply to this but they don’t have to rely on us to build the robots and that’s starting to take shape now.” – Participant I*

IT needs to be part of the journey from the start so that they do not see RPA as a threat and can ensure that the implementation of the technology element is integrated into the IT environment. Forums are established to ensure that clarity of expectations is shared across the landscape.

*“[...] implementation is the key component in this relationship management with IT because IT will see it as a threat. So, we had IT with us from day one saying come along, let’s see what you want to do, how can we integrate it.” – Participant E*

*“When the capability started out we had to partner with everyone that played a role; so be it compliance, be it risk, be it IT security, be it the technical infrastructure; we had to create a forum of partnership and educate every individual as to what does RPA now mean to their world.” – Participant F*

Although a COE had been established, there is still a reliance on IT to implement RPA solutions.

*“There is still a lot, like 30%. So, if you look at total implementation 30% IT and 70% business.” – Participant A*

*“[...] the COE from a business point of view sits in business itself however, development sits in IT.” – Participant L*

However, banks are using the business SMEs to develop skill and be involved in the automation so that they are able to support the automation after it is operational.

*“If an operational area was earmarked for process automation they would say SMEs from those operational areas teach them how to use Blue Prism tool, and effectively get them to do the automation, manage the automation and then onboard them into the team and then they will be RPA champions within each operational area.” – Participant C*

*“IT people do the work, but its business led because if you don’t have good business people in this process you are going to get a hiding next to nothing because what it does, it mimics the user.” – Participant I*

The target operating model is that business owns the process and IT govern it.

*“Yes, all of this sits in the business; none of it sits in IT. So, its owned by business and governed by IT.” – Participant E*

Ultimately, RPA cannot sit wholly in the business because IT is needed to support.

*“If I look at what you need to do to train the robot, it’s not something the business would be able to do, maybe someone in the business with a very big IT interest could do it. But I know there are other businesses where a business can do it, and I want to see how they do that.” – Participant G*

From a support and monitoring perspective, this responsibility is shared between the business users and IT.

*We monitor our own ‘bots, we have got screens as well and then a business area that does monitoring on a grander scale, we also give them access to the machines and the view and they tell us when something has gone wrong. – Participant I*

#### 4.5.2 Change management

Change management was cited by every participant interviewed and was related to the inherent association of RPA implementations and automation creating a risk of perceived role redundancy. Change management was prevalent in the literature as a significant variable for technology adoption (Lacity, 2017).

*“[...] we always had to make them see that we are here to make their lives easier or better because there is a definite threat of employment or unemployment.” – Participant C*

*“[...] not a 100% take on it because they still lack trust—how do you know at some point you don’t cut off and remain solely on robots and take out that human intervention.” – Participant H*

*“No one is going to identify a process needs to be automated if they think they are going to lose their job.” – Participant E*

The RPA change in banks is being sold as an opportunity to learn new technology.

*“[...] about driving how do we re-skill you, also about the larger campaign that says as an individual that works in a bank you going to be someone that keeps learning new skills and that plugs into that nicely.” – Participant E*

RPA is a relatively new technology and the nature of the software robot executing in the background to deliver work is difficult to understand for business users. The literature referenced developments in the approach for change management in RPA programmes which is evident in the interview data (Stople & Steinsund, 2017). Part of a change initiative in two of the banks included a video recording was made to show how the bot works so that the staff could understand the technology.

*“[...] it’s a journey I started with recording a side-by-side screen video of the code in action and the UI view on the other screen with voice-overs and explanations so that they could upskill their own board to understand what it is that we are talking about.” – Participant D*

*“So, if they allowed us to come and present at a town hall, we will then have a video that showed where we are going with this.” – Participant J*

Implementation teams need to engage across the organisation in order to create comfort with the key stakeholders and users about the technology.

*“For me it was a lot of quarrels, conversations, we went to a lot of forums introducing bots, showcasing what it does.” – Participant B*

Users need to be involved from the start of a process being automated to ensure that they co-create the automation.

*“The question is how we involve people to make sure that we are taking them on the journey where they are not going to be left behind.” – Participant K*

During the analysis of a process, SMEs are less engaged if they are not bought into automating the process or that they may lose their jobs by automating some of their roles.

*“The theory and the detail behind that is that I can’t automate the process if someone doesn’t think that the process needs to be automated. More importantly, no one is going to identify a process needs to be automated if they think they are going to lose their job.” – Participant E*

SMEs who have a deep context of the task are less inclined to articulate the end-to-end processes accurately because some of the tasks are done intuitively.

*“[...] if you ask someone to explain the process they execute, the better the technology, the more experienced the operator, the less information you going to get because the more they assume and the more they don’t think to articulate.” – Participant D*

Automated processes are run in parallel with a human team completing the same task for a period to ensure that the process does what it is meant to do. This starts to build trust with the team that the automation can be relied on to carry out the task.

*“[...] what we are trying to do as a business is run it for three months and then [compare] what it’s doing in parallel to the person.” – Participant H*

Banks are naming the bots and including them as digital workers on HR systems as part of teams to make staff more comfortable.

*“[...] on our HR system the digital employee is there, assigned to the manager of that team so when that manager goes into HR and looks at his direct reports, he will see the digital employee is there.” – Participant G*

#### 4.5.3 Executive Support

Executive support in the literature refers to misaligned expectations from executives causing a negative perception of RPA programmes (Stople & Steinsund, 2017) and taking ownership of programmes by being part of the team (Willcocks, Lacity, & Craig, 2016). The participant feedback aligned with the literature.

Executive support for RPA is gained through demonstrations of the efficiency by using a bot to carry out a manual process that is well known to take much longer time than in an automated manner.

*“It was easy to attain because we could give you a demo of a Blue Prism bot and we could have the SME talk through their manual process and what used to take somebody 7 days to do it used to take the robot almost 34 minutes.” – Participant J*

*“They did show proof of value to our CEO and the top brass and they bought into it [...]” – Participant B*

The executives need to take ownership of the initiatives in order to support the adoption and that includes showing the benefits and value to their respective teams.

*“[...] what the head of EXCO wants is that EXCO members, individually in their areas, the need to take ownership of the process and show the benefits and the value.” – Participant I*

The change management team should have senior representation in order to influence the adoption.

*“[...] they had a designated change management team which was quite senior, the manager of RPA centre of excellence is a manager himself, so I suppose he was quite involved in all these processes. Our Operations managers were also involved.” – Participant C*

*“[...] the Head of Ops has bought into this to a point where other projects in her space, she has got the standard question ‘have you checked how much can be done by a robot?’” – Participant G*

#### 4.5.4 Skills and capabilities

RPA development skills in South Africa are scarce and are not easily learned from scratch. Banks are investing in training developers on RPA in order to build skills and capacity within the banks to be able to develop and maintain RPA.

*"[...] where do you get an RPA-accredited developer; there aren't any and those that are there are very expensive so you got to build your own timber, so I built my own timber, I send people on training and I have 12 developers sitting here that can develop robotics and it's a learning curve."* – **Participant E**

*"[...] it's not that you can just pick up a guy in the street, put him there, take him on a 2 weeks classroom training, put him in a 6 weeks sprint and then after 8 weeks he can develop anything for you."* – **Participant K**

However, opportunities to evolve skills and capabilities for the business focussed employees in the banks are created when RPA is adopted.

*"[...] here you are slanting a question to say are you not at risk of reducing roles, you actually create a different role."* – **Participant D**

*"Can I now take you and teach you a new skill or can I take you and maybe keep you in the same skill that you are in but let you do more of the cognitive work that you previously couldn't do."* – **Participant E**

Banks are finding it difficult to support RPA once it has been delivered. Each time the underlying or core system undergoes a change, RPA could be affected by the change and has to be configured to cater for the change.

*"From an IT perspective, we are still battling with the support."* – **Participant G**

*"[...] what we are talking about is a new technology; we are talking about something that requires, it may be autonomous, but it requires maintenance; it requires a command centre; it requires review and audit logs; it requires a different skills set; it requires tweaking [...]"* – **Participant D**

Development standards and practices need to be developed for a sustainable support approach to be adopted.

*"Being able to build objects, that's the easy part but to build objects in the way that's meaningful and make sense and it's easy to identify, easy to fix, that takes skill."* – **Participant L**

Consulting organisations are often brought into banks to deliver RPA solutions when they have been misled by vendors or consulting companies in terms of the complexity of automating tasks using RPA. This is common in the literature and found outside of the South African context (Kirchmer, 2017).

*"[...] sales pitches put out there by consulting houses to say you can do this for next to nothing, its super-fast and it's so simple anyone can do it. Which I think it's true but also very misleading."* – **Participant C**

*“Because it’s new technology once we partnered with a vendor [...]” – Participant F*

The literature references cases where banks use consulting organisations to blend in with existing teams so that the existing teams can learn the technology, build knowledge, and start to develop their own automated tasks (Lacity, 2017) which is prevalent in South African banks.

*“When we introduced Blue Prism we had a lot of these consulting partners that came in and helped us with it and then once they showed us, once they handed over the skill and knowledge, then they just looked after it from a run perspective and we did the dev work [...]” – Participant J*

In some instances, vendors or consulting companies are being used to augment existing teams due to the lack of skills and elastic team requirement based on business demand.

*“[...] it does help you to a certain extent because you only have so much skill that you are sitting with internally so your throughput is a lot lower, everybody these days can do a bit of RPA, or they claim to.” – Participant L*

Some of the consulting companies are new to the technology and can communicate how the technology should work but when it comes to implementing this can delay delivery of the solutions.

*“They sold the talk, but the action was, let’s call it, not as expected. Some were good but most were, not as competent as they sold themselves. So, implementation-wise from a vendor supporting us, that was a challenge.” – Participant B*

#### 4.5.5 Trust

In the literature reviewed, trust as an adoption factor is dealt with through change management. Ineffective change management results in trust not being gained (Willcocks & Lacity, 2015). Inherently when parts of people’s jobs are automated a fear exists of losing their job emerged as a theme on its own because trust needs to be gained before RPA can be adopted in banks.

*“I think at first they were very hesitant to do something like that because a lot of times when you want to automate things people think that they will be out of a job.” – Participant A*

*“[...] this concept of RPA is still a fear-based, the people are afraid of losing their jobs.” – Participant F*

The impact of fear on effectively identifying processes to automate is that staff are unwilling to identify processes that they perform that would be suitable for RPA to do.

*“[...] no one is going to identify a process needs to be automated if they think they are going to lose their job.” – Participant E*

*“[...] they would not send transactions to the robot because they didn’t believe in it and obviously people are clever, the fear of losing jobs and stuff like that [...]” – Participant I*

Trust is created by sharing cases where staff have benefited from RPA and have resulted in them being able to have more time to focus on more engaging activities.

*“We have a communication campaign, [...] this is Bob, Bob has 25% of his day more because part of his job has been automated now, he takes 25% spends it doing x.” – Participant E*

Demonstrating the efficiency gains to the staff of banks builds trust and advocacy which starts to create the desire for RPA to be embedded in operations.

*“People are very upfront in certain areas, very sceptical so they will give you the small one ‘show me, prove to me,’ that’s the type of things we have done.” – Participant I*

*“[...] when the SMEs start selling the benefits of automation it’s so powerful because we will never be able to get a business user to understand true potential unless one of their own is telling them the benefits that we brought to their world.” – Participant J*

Proof of concepts can be used to build trust at an executive level to embark on an RPA implementation.

*“It took me probably 6 months to convince my management, so the exco and ops, she gave me a little bit of money in order to go do a POC.” – Participant I*

Once trust is gained, some staff start to engage in developing skills to differentiate themselves.

*“[...] a new buzz word with business is RPA and I think also with people looking how they want to reposition themselves from a career perspective.” – Participant L*

#### 4.5.6 Use of technology

The use of RPA in banks in the literature covers specific cases where integration has previously been challenging by accessing the systems over the front end (Cahill, 2017). In the interviews, it was shared that RPA mimics what users can do by using screen scraping technology and then automating the steps users would go through to complete a task.

*“[...] a lot of the processes we have automated are essentially front scraping of user interface and what typically human beings do now.” – Participant B*

*“RPA is mimicking what a person does on a system today.” – Participant F*

RPA is being used in the back-office and middle-office in the banks, similarly as reviewed in the literature (Dilla & Jaynes, 2015). It is effective in solving batch or volume-based processes in the back-office and in the middle-office it is being used to answer simple queries.

*“[...] we using it for middle-office and back-office at the moment middle-office basically your batch processes and middle-office your customer request like asking for statements or letter of account confirmation.” – Participant A*

*“The majority of them are back-office processes. Some of them are middle-office.” – Participant B*

*“[...] if it is rules-based work and it's done 1,2,3,4 and there is a lot of data that we use to do that work and it's done repetitively, 300-400 times a day; that’s a very strong use case for automation.” – Participant J*

Bots are being used to open accounts, make payments, check debit order validity, vehicle settlement calculations and letters, as well as other operational tasks.

*“[...] some bots that do payments; we also got the debit order reversal bot; we also got a lot of shared service bots that do a lot of operational tasks and activities. Even in the retail and business bank space, for example, if as a customer want a vehicle asset payment settlement letter, a bot does that now.” – Participant B*

*“[...] they wanted to bring RPA into operational areas that handled the invoicing and quotations for vehicle and fleet management.” – Participant C*

*“We have done things like capturing applications so systems that are used to record in client accounts, create client accounts KYC et cetera.” – Participant F*

*“We have built a robot that process in the region of about 50 000 cross border incoming payments.” - Participant I*

*“Invoice processing, service level agreements, we are looking at home loan applications, car loan applications, we are looking at month-end reporting, printing control.” – Participant J*

RPA can integrate with core banking systems as well as legacy applications which have proven difficult to integrate with previously.

*“[...] we touching quite a few of the major core systems, even our biggest legacy mainframe applications, although that’s the massive challenge with bots because those things don’t gel very well with legacy applications.” – Participant B*

*“If you look at an older business unit that has got a lot of legacy and a lot of analogue inputs then there is an opportunity for RPA.” – Participant D*

## 4.6 Environment perspective

The dominating theme in the environment perspective was government. This pertains to the influence that unions have on RPA adoption in banks. The South African context was the major reason for the theme being dominant because of the interest of the unions when jobs are impacted. Further, banks are regulated institutions and there was some discussion on how using bots would impact these regulations. Social relationships, the second most cited theme, is strongly linked to the societal impact that automation has on society and the perceptions that need to be managed with employees. These are shown in table 13 below.

Sub-theme	Sources	References
<b>Environment perspective</b>	<b>11</b>	<b>70</b>
Government	9	32
Social relationship	8	23
Industry influence	8	14
Media	3	3

Table 12 - Sub-themes in the Environment perspective by sources and references

#### 4.6.1 Government

There is currently no government or banking regulation that limits banks from using bots to complete operational tasks.

*“From a regulatory perspective they are obviously keen to understand what we are doing but, in many cases, my immediate standpoint is all we are doing is adding more workers to the workforce force, doing processes typically were done by human beings.” – Participant A*

*“We haven’t had to deal with any form of regulatory issues.” – Participant F*

*“[...] in RPA ultimately, you may call it a virtual employee or creating a virtual workforce but ultimately it is an application so currently the banks has been heavily governed by IT and IT risk.” – Participant K*

Regulators may start to become involved when AI and machine learning solutions start to make decisions for banks.

*“I think where the regulator is going to be a little bit, maybe more involved, potentially when we start to have, AI and machine learning become more and more prevalent in solutions.” – Participant A*

Banking compliance regulations require that there is an audit trail of an event following tasks being completed and this is recorded as part of the operation of RPA, all events are logged for review (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017; Dilla & Jaynes, 2015). RPA bots are given the same access rights as a worker would and therefore the interpretation is that this fits in with normal operation.

*“But that robot can only execute based on the profile function it gets for that system. We then obviously will have the business owners of these systems just approve that the robot gets a particular profile setting. That’s a compliance aspect.” – Participant F*

*“[...] because we are treating it as an employee; whether it’s a human or whether it’s a digital employee. If it’s a digital employee that digital employee has to be trained. Programmed and it can only do what is meant to do.” – Participant G*

Banks ensure segregation of responsibility to ensure that bots are not able to deviate from the process, which would put the bank at risk.

*“To have a robot dealing with real money, for instance, is something we shy away from because of the fact that you could actually build a robot to commit fraud.” – Participant J*

Unions are concerned by the impact that automation has on their members retaining their jobs (SASBO, 2018). As employers, banks recognise this and reported that they also have a social responsibility to look after their staff.

*“[...] when it first came out that we are going to be adopting RPA the unions were, obviously the members of the Union they obviously spoke to the unions and the Unions wanted assurance that people weren’t going to lose their jobs.” – Participant A*

*“[...] the Unions are heavily interested as it is their role to look after their members. A socially responsible employer also adopts a level of that role too.” – Participant D*

The unions have hosted summits engaging major banks on the impact of RPA on their members and ensuring that they have clarity of the approach that the banks are taking and that the banks are acting responsibly.

*“We had a two-day summit around automation with SASBO this year. And they know it is coming but it’s a case of ‘let’s talk with each other.’ So, we have always, since day 1 we have engaged [...]” – Participant E*

*“Last year I attended a SASBO, from a regulatory body that looks after people, I attended the SASBO indaba last year around automation and the president of SASBO said that automation is here; we know that automation is here, we know that digitisation is here, we accept it but all we ask you to do is when you are applying automation or digitisation in your organisation, just be human about it.” – Participant L*

#### 4.6.2 Social relationships

South Africa has a high unemployment rate compared to global statistics and it is therefore important for banks to provide opportunities for employment (World Economic Forum, 2017). It is important for banks to ensure that their staff can evolve their careers and remain relevant to be employable.

*“South Africa having the statistics, the unemployment stats that we do have, employment or keeping people employed is very important so one of the ways they combated that central problem was by including individuals, up-skilling into their centre of excellence from those operational areas.” – Participant C*

*“[...] talk to human impact and if you don’t have an appropriate strategy right upfront if you don’t know that in fact, you are creating new roles of a different type as opposed to simply consider a robotic factory-type of work.” – Participant D*

Banks do not embark on RPA implementations to reduce headcount, instead, they are looking to redeploy staff to more engaging tasks.

*“[...] on average you sitting at about 110% capacity with the current people that we have got. The 110% is not likely correct, we might have silly stuff in there so how do we get it back to 100 or 90% but focussing on the right stuff.” – Participant A*

*“Although in other industries, that’s the consequences of robotics that people have been without jobs; we see it [RPA] as a supplement.” – Participant G*

RPA is not the only reason that employees’ roles at banks are at risk, operational requirement changes and restructures result in affecting roles at banks.

*“[...] it’s safe to say RPA has the ability to affect roles; that said RPA, is not the only technology that has the ability to affect roles Business model changes, any other tech has the ability to affect roles.” – Participant D*

Congruent with the literature (World Economic Forum, 2017), automation is expected to reduce the number of jobs but according to a research company, it will create more jobs than will be lost.

*"[...] it's also Gartner who say we are going to lose 1,8 million jobs through automation and create 2,1 million jobs."* – **Participant E**

#### 4.6.3 Industry influence

Like many other emerging technologies (Salwani, Marthandan, Norzaidi, & Chong, 2009), banks have adopted RPA in order to gain competitive advantage and to limit the disruption caused by digital banks and fintech's.

*"If your more niche digital banks start popping up, fintech start popping up, the bank needs to compete. So definitely the external factors are the greatest magnitude of force to have gone the bank on this journey."* – **Participant F**

*"The bank is lagging slightly behind our competitors; we have taken a much more strategic approach to RPA. I know because we are very close to some of our competitors, that they have thrown a bot at anything that looks like a process."* – **Participant L**

*"[...] Chief Digital Officer, he formed his own organisation and we were basically tasked to disrupt the bank, go and look at tech that can disrupt, go and look at tech, our best, our most common and our most top ten services in the bank on how we digitise it. It was basically robotics was forming under this strategic digital umbrella."* – **Participant B**

Banks are being influenced by other banks reporting efficiencies and innovative approaches using RPA which has motivated an investment into the technology.

*"[...] there has been a lot of talk starting in the call centre with robo-advice and I think one of the other banks that launched it."* – **Participant H**

*"[...] the friend is also in the industry in the sense of from a consultancy perspective and with their work with another bank."* – **Participant I**

*"One of the bank's CEOs heard about this robotics thing and asked that we go out and investigate on what it is and whether we have a space to put it in, so I did the investigation with the support of my team and it was a no-brainer."* – **Participant L**

RPA is being used as a digitisation strategy to enable the capability for AI.

*"You need to automate and digitise before you can actually get the value of artificial intelligence come through."* – **Participant F**

In one instance, the banks offshore Business Process Outsource (BPO) provider responsible for back-office processes had adopted RPA and the efficiencies gained influenced the bank to investigate the technology.

*"[...] our outsource provider, one of our providers has implemented robotics and we saw a benefit from what they were doing on their side."* – **Participant G**

#### 4.6.4 Media

It was a less significant variable cited by the participants but the media's influence on the hype around RPA was covered (Davenport & Kirby, 2016). The media has created hype about RPA and created an expectation of the benefits that the technology can bring to organisations.

*"[...] there is this hype about people losing their jobs because of robotics so that sparked it. But it was obviously media [...]" – Participant H*

As referenced in the literature about the fear of automation (Dilla & Jaynes, 2015), the impact of automation and robotisation associated with RPA has created anxiety with staff which has had to be managed by the banks.

*"I think from the management perspective it all is depending on how they socialise automation or digitalization with their employees." – Participant K*

### 4.7 Chapter summary

This chapter covered the analysis and findings of the interview research. The analysis was conducted using the perspectives of the TOE framework with themes from the interview data aligned to each perspective. The findings are as follows:

#### 4.7.1 Technology perspective

Reduced admin, reduced costs, simple implementation, consistent quality, scale based on demand and twenty-four seven service availability were found to be benefits that had a positive impact on adoption of RPA. It was found that ill-defined processes had a negative impact on adoption. Application support and the support of IT security teams for the initiative was found to be challenging for RPA implemented processes. RPA was found to be an enabler for future AI implementations.

#### 4.7.2 Organisational perspective

The structure of the teams supporting an RPA initiative was found to impact the adoption. Various permutations of business led, IT executed approaches were found to have varying impact on the adoption of RPA. Change management was found to be a significant adoption factor in the interview data, which was related to the participation and support of executives and management. Trust had an impact on adoption and was also related to the extent of the change management initiatives. Various financial services related RPA use cases were discovered in the interview data.

#### 4.7.3 Environment perspective

Government involvement and the impact of the unions in South Africa contributed to the complexity of adoption of RPA in the banks. The consideration of responsible automation and clarity about augmentation of teams with technology was found to have a positive impact on adoption. The fact that other banks are using RPA for competitive advantage was found to contribute positively on adoption. The media had both a positive and negative impact on adoption depending on the created perception of RPA.

The findings are discussed in the next chapter.

## 5 Discussion

The findings in chapter 4 are discussed in this chapter. The findings are organised according to the perspectives of the TOE framework.

### 5.1 Technology

Perceived benefits were highlighted in the literature and were grouped by expected business and customer benefits. These business benefits included reduced admin (Vedder & Guynes, 2016), reduced costs (Dilla & Jaynes, 2015; Davenport & Kirby, 2015), simple administration, and easy integration (Herbert, Dhayalan, & Scott, 2016). For customer benefits, the literature highlighted faster release times (Davenport & Kirby, 2016), consistent quality (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017), high availability (Herbert, Dhayalan, & Scott, 2016), and increased scale to deal with requests efficiently (Anagnoste, 2017). These perceived benefits were consistent with what the participants shared as the benefits that they are expecting or are experiencing in the banks.

The findings for reduced administration was found to be a benefit of the participants in the interviews. It was revealed that the infrastructure build is complex and needs IT security and IT to buy in to the program. This was partially found in the literature where IT is needed to be engaged for successful implementation (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017) but is not as simple as some researchers stated. The participants shared that once that was achieved, then automating processes was relatively straight forward which is what was found in the literature (Vedder & Guynes, 2016). The participants also shared that the banks are managing bots as they would a user which reassured IT security and mitigated the risk of the robots going rogue, which was a challenge found in the literature (Lacity, 2017). It was found through most of the interviews that the reduction in costs by implementing RPA was not attributed to a headcount metric but that the efficiencies that RPA brings have a positive impact on the cost-to-income ratio in the banks. This is congruent with what some of the research posits (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017) and incongruent with researchers who state that the direct benefit of reduced costs was aligned to headcount reduction (Dilla & Jaynes, 2015). The benefit of consistent quality and the fact that RPA digitally records its actions for compliance purposes was found both in the literature and also in the interviews (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). One of the participants cited the ability to scale at month-end when administration was particularly demanding as a benefit that the bank was leveraging which was not found in the literature reviewed. Using bots for twenty-four hours a day availability was not commonly found in the interviews, one of the participants shared that there were too many dependencies for RPA in their implementation to keep the bot busy overnight. Another participant shared that they used the bot to query a busy website during the night when there was less traffic on the site.

There is corroboration in the literature review that stable or suitable processes impacted the effectiveness of RPA. The success of automation relies on the processes being automated to be well defined (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). This is prevalent in the feedback received from the participants. Participants also cited that they used process engineers and software programs as part of the process to potentially fix a broken process and then automate it or in some cases, the need for automation was satisfied with a fixed process. Application support was also referenced by the majority of the participants. In some of the interview data gathered it has a negative impact on the effectiveness of RPA in banks. This is related to the theme of organisational

structure because of the dependency on the business owning and managing RPA (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). It was evident that application support was an issue where the organisational structure was not clear, but RPA was found by one of the participants to create a consistent view of the application to help decipher between user and system error. IT security emerged as a technology challenge and was isolated from the organisational trust theme because of the impact security has on the technology perspective. The literature refers generically to the importance of alignment with IT (Willcocks, Lacity, & Craig, 2015a) but does not reference the importance in a banking context that was shared by the participants. The literature did not refer to the possible licence agreement non-compliance where bots are accessing systems licenced to a single user. It was consistent in the literature and the interviews that RPA is used in cooperation with AI (Lacity, 2017).

## 5.2 Organisation

The literature referenced that successful RPA programmes were dependent on the business owning and managing the process and aligning with IT (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). This was evident in the responses from the participants where most referred to using a centre of excellence (COE) structure that included IT and business stakeholders. There was also some variance in the interview data in terms of whether the COE was dominated by IT or by the business and some evidence supported that depending on the maturity of the COE would depend on how involved IT is.

The less mature RPA was in the organisation, the more IT dominated the COE. This could account for the conflicting research in the literature where some authors place a higher level of ownership on IT (Zaharia-Radulescu, Pricop, Shuleski, & Ioan, 2017). The reference to a formal COE was not evident in the literature and was cited by the participants that this formal approach was recommended by Blue Prism which was developed in conjunction with a bank and also dominated the interviewed participants' RPA implementations. The bank that had not adopted the COE approach had misaligned ownership of RPA in the bank. It is common in the literature that a well-defined change program is needed for RPA (Lacity, 2017) and this was confirmed by the interview data.

The scepticism found in the interviews was attributed to the fear of the consequences of automating work rather more than what was found in the literature pertaining to the technology not delivering on its expectations (Lacity, 2017). That said, executives were won over by demonstrating the capabilities from what was shared in the interviews. This approach also built trust in RPA and ensured that leaders were supportive of the program which is referenced in the literature to be a key adoption factor (Stople & Steinsund, 2017).

The interviews also confirmed that unique change programs are needed for RPA (Krishnan & Ravindran, 2017) and participants gave examples of using videos, town halls, and forums to develop trust in the program which was not found in the literature. Some researchers state that RPA can be configured by business users (Lamberton, Brigo, & Hoy, 2017) but the participants mostly supported the view that some advanced skills in RPA are required (Trkman, 2013).

It is consistently found in the literature and the interview data that some consulting and RPA vendors augment teams initially until banks team can take over (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017). One of the participants found that a recognised consulting firm needs

to figure RPA out themselves locally. The use of RPA technology was found to be consistent with the literature, mainly in back and middle-office applications (Cahill, 2017). The interviews found more specific use cases where bots are being used to open accounts, make payments, check debit order validity, make vehicle settlement calculations and letters as well as other operational tasks.

### 5.3 Environment

The literature covered the societal impacts both for and against automation from an RPA perspective (Dilla & Jaynes, 2015) particularly referencing the possibility of jobs being lost. The interview data contains references to SASBO, which is a South African union, who are also concerned about the effect of RPA on jobs in South African banks (SASBO, 2018). There is some overlap of these themes. The participants shared that there are not any regulations governing the use of bots to carry out tasks in banks, and that banks are treating bots as workers to segregate areas of responsibility/functionality. The literature reviewed did not cover this from a banking regulation perspective but there was a participant who suspected that this may come into play when AI starts making decisions. As discussed under technology, participants aligned with literature that the audit trail from RPA tasks is a benefit for the regulator. Unions are engaged with automation programs and are being collaborated with to ensure alignment in the approach. They also host events for information sharing. This was not found in the literature reviewed. In the interviews, it was found that participants feel banks have a responsibility to their workforce and are ensuring that they remain relevant through upskill programs and this corroborated with what is in the literature (Stople, Steinsund, Iden, & Bygstad, 2017). None of the banks cited directly reduced headcount as a motivation for RPA which was discussed under benefits where there were conflicting views in the literature. Reference was made to other organisation and operational changes also impacting people's roles at banks.

Industry influence is aligned with the literature, RPA is being implemented in the hope that efficiencies can be gained (Stople & Steinsund, 2017). Some participants also said that RPA is viewed as a gateway to a more holistic digital strategy which was not directly referred in the literature but can be inferred by the opportunity for banks to better integrate their systems (Herbert, Dhayalan, & Scott, 2016). This is elaborated on by participants saying that emerging fintech's have less technical debt and can take advantage of digital opportunities more easily, driving the need for RPA in legacy banks. Although there was a reference to media reporting South African banks using robots and automation was found during the interviews but was not a significant influence on RPA adoption across all the banks.

### 5.4 Summary of findings

The findings in this chapter were used to answer the research questions.

**The primary research question is:**

What factors influence the adoption of RPA in South African banks?

**The sub-research questions are:**

1. What **Technology** factors affect RPA adoption in South African banks?
2. What is the **Organisational** impact on employees for banks adopting RPA in South Africa?
3. What **Environmental** and institutional pressures contribute to the adoption of RPA in South African banks?

#### 5.4.1 What factors influence the adoption of RPA in South African banks?

From a technology perspective, the perceived benefits have the most significant influence on adoption. These include simple implementation, admin reduction, reduced costs, consistent quality, scale based on demand, and twenty-four-seven availability. Challenges that are faced during implementation that would influence adoption are selecting suitable processes for automation, a structured application support approach, and buy-in from the bank's IT security team.

Organisational factors that would affect RPA adoption in South African banks are a balanced and mature structure in the form of a COE which is led by business and managed by IT. A change program that includes executive participation and support. Upskilled staff and access to consulting organisations to assist with upskilling the teams and finally trust built with the staff that the program is intended to improve their engagement.

Environmental factors are the collaboration between South African banks and the unions to ensure that a responsible approach is taken to automating mundane tasks balanced with creating opportunities for staff to grow their competencies. Industry coercion exists influencing the adoption of RPA and for the development of a multitude of use cases to gain a competitive advantage.

#### 5.4.2 What technology factors affect the adoption of RPA in South African banks?

South African banks are motivated to adopt RPA because of the efficiencies gained by automating repetitive tasks. The automation creates capacity for staff to spend time on more engaging work and present the opportunity to increase their skillset. South African banks can easily integrate legacy systems with more modern systems by utilising the front-end capabilities that RPA has to engage with legacy systems. The automated nature of RPA, which includes logging, enables auditing to occur, helping banks comply with the regulation. Banks can easily scale workloads by multiplying the number of bots to carry out repetitive work.

The motivating factors are moderated by carefully selecting the processes that are fit for automation: ill-defined processes do not yield the expected results of RPA. IT security in banks needs to be collaborated with to ensure that the implementation of RPA does not deviate from internal governance protocol.

#### 5.4.3 What is the organisational impact on employees for banks adopting RPA in South Africa?

Adopting RPA in South African banks initially brings fear and mistrust of intent in the banks. A significant effort needs to go into a change program where leaders and executives show support for the program. At times, leaders need to be brought on board through demonstrations of the technology. South African banks are not looking to reduce headcount in their organisations by using RPA, there is a drive to increase efficiency, accelerate their digital strategy and redeploy staff into roles that are more cognitively fulfilling. Staff do have the responsibility to ensure that they are evolving their skills but most banks are supporting staff in doing so.

#### 5.4.4 What environmental and institutional pressures contribute to the adoption of RPA in South African banks?

South African banks, as many global traditional banks, are in danger of being disrupted by digital banks and fintech's. South African banks are using RPA to accelerate their digital strategy and

lowering their cost-to-income ratio to compete with emerging banks that have less technical debt. Mimetic isomorphism is evident in the banks since they have adopted RPA to compete with the aspiring digital financial organisations. Banks are using consulting organisations to initiate or redefine their approach to RPA implementations. There is a commonality that the consulting organisations have brought to the program and thus have aligned approaches. This normative isomorphism is evident in the Centre Of Excellence formations within the banks.

## 5.5 Adoption factors impact on the research model

Using the findings from the interview data corroborated with findings in literature, the research model impact has been updated.

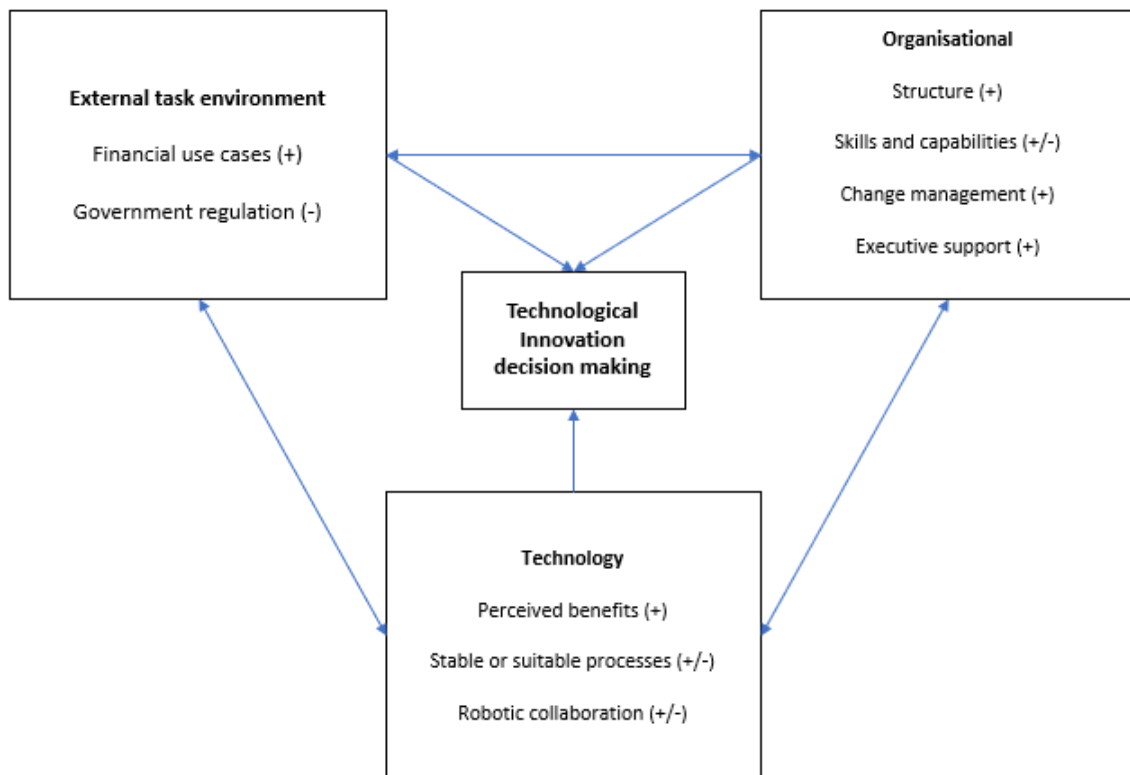


Figure 3 - Updated and adapted TOE framework (Tornatzky & Fleischer, 1990)

## 6 Conclusion

This study looked at the factors that drive adoption in South African banks and intended to answer the research questions posed as part of the objectives of the research. Many factors influence the adoption of RPA and although research in RPA is limited, similar automation technologies have been previously researched. South African banks have been implementing RPA and the factors affecting adoption have been varied. Automation and the impact on peoples work lives has been prevalent in research and media.

The research model proposed that adoption factors could be grouped by technology, organisation, and environment factors. Perceived benefits, stable or suitable processes and robotic collaboration are technological factors that affect the implementation and adoption of RPA. Structure, skills, and capabilities change management and executive support are organisational factors that affect the implementation and adoption of RPA. Financial use cases and government regulations will have an impact on the adoption of RPA in South African banks

Interviews were conducted with participants that worked in banks in South Africa. The interview data was processed using thematic analysis to group the data into themes. The findings were corroborated with the research literature to understand the impact of the factors that drive adoption of RPA in South African Banks.

The major findings of the research are that South African banks are adopting RPA to derive the expected benefits. This is consistent with organisations in other industries using similar automation technology. South African banks experienced similar challenges automating ill-defined processes, supporting automated processes, and aligning with IT security teams. South African banks have experienced similar organisational challenges than what has been recorded in the research. A unique finding is that South African banks need to work closely with trade unions to ensure that the approach to automation is responsible by considering the impact on employment rates in the banks. South African banks are augmenting teams with bots and allowing staff to work on more engaging work like other industries and contexts.

The implications of the research and future research recommendations are detailed in the sections that follow.

## 6.1 Implications

**Academic:** The research contributes to the body knowledge by presenting accounts of how RPA is impacting banks in South Africa and giving a deeper understanding of the phenomenon. The research aims to create a case for reference for future research so that future cases can compare and generalise commonalities. The use of the TOE framework for the adoption of new technology can also be added to the cases used in research.

**Industry:** South African banks wanting to successfully embed RPA into their organisations need to ensure that they are aligned with the expectations from the unions. Banks have their own responsibility to ensure that staff are equipped to remain relevant in a digitally inspired organisation so that they can continue to positively contribute to the bank. An engaging change program that starts by educating staff about the intention of RPA should be planned to keep staff included from the offset. In terms of the technical implementation, banks should engage with an experienced practitioner to help set up an operating model that is conducive to supporting and maintaining RPA independently. A COE structure has worked well for the banks. Processes need to be carefully selected to ensure that they are fit for automation to avoid impacting the credibility of the program. Process engineers and software can be used to analyse the requirements.

## 6.2 Suggested future research

Future research can include a comparison of several accounts of RPA adoption cases. This would allow the testing of adoption models and determine the similarity and significance of the adoption factors. There would be value in conducting the research as RPA and AI mature in organisations and understand the impact on staff in banks following pervasive RPA adoption. Adding the user context to sample would create a social perspective on how users have been impacted by automation and what they have done to mitigate the relevance of manual work in the banks eroding. A longitudinal view of RPA adoption would be able to measure whether efficiencies have allowed traditional banks to become more digital and more closely aligned on emerging fintech's.

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## 8 Appendix

### Appendix A: Research questions

#### Housekeeping

- Can I please record the session?
- This research has been approved by the Commerce Faculty Ethics in Research Committee.
- Your participation in this research is voluntary. You can choose to withdraw from the research at any time.
- The questionnaire will take approximately 30-40 minutes to complete
- You will not be requested to supply any identifiable information, ensuring the anonymity of your responses.
- Due to the nature of the study, you will need to provide me with some form of identifiable information however, all responses will be confidential and used for the purposes of this research only.
- Should you have any questions regarding the research please feel free to contact me.

#### 1. Where is your organisation in your RPA journey?

- a. A. Starting Point: Not Started or Dabbling with RPA
- b. B. Work In Progress (Midst of RPA Deployment)
- c. C. "Reset" / Redefining Role of RPA
- d. D. Scaling RPA

#### 2. Where is your organisation on the Intelligent Automation Spectrum?

- a. Not yet started
- b. Task Automation
- c. Process Automation
- d. Process Orchestration
- e. Business Operations Re-creation

#### 3. What factors influenced the decision to adopt RPA?

- a. Strategically, how did the initiative come about?
  - i. and was there an influence from other banking players in the market?
- b. How was (the need that RPA is addressing) it done before?
- c. What would you say the major benefits are at a high level?
  - i. Did this differ from your original expectations before implementing RPA?
  - ii. Customer perspective?
  - iii. Business perspective?

#### 4. Where in the bank is Robotic Process Automation (RPA) being used?

- a. What types of processes are being automated?
- b. What systems does it use or integrate with?
- c. Is it able to drive efficiency in operations/business processes?

#### Environmental perspective

#### 5. Are there compliance or regulatory considerations when automating these processes?

- a. What mitigations are in place?
- b. Have processes not been fit for automation due to banking governance?
- c. Has RPA improved compliance through automation?

#### 6. What level of engagement is required with the trade unions either internally or external factors?

#### Technology perspective

**7. What technology challenges or considerations were faced after implementing RPA?**

- i. How was RPA enabled?
  - i. Infrastructure perspective
  - ii. Change management perspective
  - iii. Which RPA vendors are currently used in the environment?  
What has been your experience with RPA pricing and contract negotiations?
    - A. Have not negotiated or started paying for RPA services
    - B. Primarily subscription-based pricing (Purchasing on a per bot basis or per component)
    - C. Primarily Consumption-based pricing
    - D. A blend of subscription and consumption models
    - E. Other
- ii. Has RPA fulfilled what the vendors said it could do?
  - i. Were there any gaps in what you expected
- iii. What is your level of satisfaction (or remorse) with your current use of RPA software?
  - A. Not started yet or are unsure where to go
  - B. Satisfied with initial POCs
  - C. Buyer's remorse has not achieved ROI
  - D. Achieved some benefits but still struggling to scale
  - E. High Satisfaction – moving towards enterprise adoption
- iv. Did the technology landscape have to change?
- v. Which processes were initially selected for RPA and what lessons have been learnt when automating processes?
- vi. What is the lead time between a business requirement and automating that process?
- vii. How is the integrity of the process maintained during the automation release?

**Organisational Perspective**

**8. What organisational challenges or considerations were faced after implementing Robotic Process Automation?**

- i. How was management involved in the initiative?
- ii. At what point did users get involved in the implementation?
- iii. Were there any formal change management exercises?
  - i. How was this done?
- iv. What was the role IT and the role of the business during implementation and what are their respective roles now?
  - i. What skills are needed to maintain RPA and how are these being sourced within the banks or from partners?

**9. How has the system affected the users?**

- a. How do their requirements vary?
- b. Has the type of tasks that are involved in the change?
  - i. If so, how have they changed?
- c. How do you ensure participation with RPA?

**Future use**

**10. Do you have any ideas or comments on the use of Robotic Process Automation in your organisation or elsewhere for the future?**

Appendix B: NVIVO Coding

Nodes		Search Project	
Name	Files	References	
Environment perspective		11	72
Government		9	32
Industry influence		8	14
Media		3	3
Social relationships		8	23
Organisation perspective		11	228
Change management		11	44
Executive support		8	19
Skills and capabilities		10	42
Structure		11	62
Trust		8	24
Use of technology		10	37
Technology perspective		11	234
1. Perceived benefits		11	152
24-7 Service availability		5	9
Admin reduction		10	36
Consistent quality		8	19
Reduced costs		8	28
Scale based on demand		5	15
Simple implementation		10	44
2. Challenges		11	73
Application support		9	22
IT security		6	19
SME engagement		3	4
Stable or suitable processes		9	23
3. Technologies		1	1
Direct benefits		0	0
Indirect benefits		2	7
zFuture Use		8	16

## Appendix C: Example references used for code creation as part of Thematic Analysis process

Codes	References	Example reference
<b>Industry influence</b>	2	"I don't think that the bank has ever had the view because of the other banks"
<b>Social relationships</b>	3	"Currently we work very closely with the unions"
<b>Change management</b>	2	"I think the biggest one was change management."
<b>Executive support</b>	2	"The management is involved in a weekly\monthly basis."
<b>Skills and capabilities</b>	3	"[...] at the moment, it is very much outsourced to companies where we moving to get the development inhouse."
<b>Structure</b>	5	"It is a shared responsibility, so it is a colocation where we have standards, software and vendor management sit in IT, and then basically the identification, the build, support and maintenance sit in the business itself."
<b>Trust</b>	1	"I think at first they were very hesitant to do something like that because a lot of times when you want to automate things people think that they will be out of a job"
<b>Use of technology</b>	3	"[...] middle office basically your Batch processes and middle office your customer request like asking for statements or letter of account confirmation etc"
<b>24-7 Service availability</b>	3	"[...] so no longer do you have to come in the morning and scroll through your inbox and see that this customer wants a copy of his statement"
<b>Admin reduction</b>	7	"What we realised is that the focus of the bankers and many of the staff is that they spend time on mundane tasks"
<b>Reduced costs</b>	4	"I think in 2018 we saved close on 240 000-man hours. So, we convert it to back to man hours saved. We then work out the cost savings or the profit increases."
<b>Simple implementation</b>	6	"[...] because what is happening you have got this small thing called RPA, but you have a whole evolution of technology stacks sitting in the bank."
<b>Stable or suitable processes</b>	4	"We will see that this customer is doing the following activities over and over five times a day, And based on that we will then see across all twelve thousand bankers how many do that and then we will automate the process."
<b>BPM</b>	3	"It was tried but I don't think that the time was right for it actually going into these things."
<b>Indirect benefits</b>	2	"[...] my aim for the bank is to try and use machine learning and deep learning in terms of customer behaviour to trigger a robot when you walk into a branch and we will facilitate your request via an RPA solution."
<b>Future Use</b>	1	"[...] in our space, if you googling a Mauritius trip at night via the digital marketing stuff and the machine learning and deep learning it will trigger identify that you are looking for travel and once you go to a branch we pick up your IMEI number and we can then ask whether you are interested in travelling and when you positively respond it becomes a general discussion where we could assist with travel cheques, credit card limit upped, tickets booked or whatever and the moment you give that information it kicks off RPA processes which is then fully automated which means that get your documentation on your mobile phone"



## Appendix E: Research consent form



### Department of Information Systems

Leslie Commerce Building  
Engineering Mall, Upper Campus  
OR  
Private Bag X3 - Rondebosch - 7701  
Tel: +27 (0) 21 650 2261 Fax: +27 (0) 21650 2280  
Internet: <http://www.commerce.uct.ac.za/informationssystemsf/>

30 September 2018

#### Request to conduct research and interview participation consent form

Dear Sir/Madam,

In terms of the requirements for completing a Master's Degree in Information Systems at the University of Cape Town a research study is required.

The researcher, in this case **Mark Tew**, has chosen to conduct a case study entitled "**Robotic Process Automation (RPA) adoption in the South African banking industry**". The objective of the research is to understand the factors that affect the adoption of RPA in South African banks.

Your participation in this research is voluntary. All information will be treated in a confidential manner and used exclusively for the purpose of this study. No individual names will be recorded or published. You will not be requested to supply any identifiable information, ensuring anonymity of your responses. You can choose to withdraw from the research at any time for whatever reason, in accordance with ethical research requirements.

The data collection method will be one-on-one interviews with a small group of the staff responsible for automation. The interviews will be conducted at your premises and will last a maximum of 60 minutes. If you are willing to participate in this study, kindly sign the attached form and return to me at your earliest convenience.

Should you have any questions regarding this research, please feel free to contact me on **0724351055** or email: **marktew@hotmail.com**

Your participation in this study would be greatly appreciated, but is entirely voluntary.

Sincerely,

Signature removed to avoid exposure online

Signature removed to avoid exposure online

#### **Mark Tew**

Researcher \ B.Com Student, (UCT)  
Department of Information Systems  
University of Cape Town  
Email: [marktew@hotmail.com](mailto:marktew@hotmail.com)

#### **Adheesh Budree**

Research Supervisor  
Department of Information Systems  
University of Cape Town  
Email: [Adheesh.budree@uct.ac.za](mailto:Adheesh.budree@uct.ac.za)



## Department of Information Systems

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### Research Participant Consent Form

I, \_\_\_\_\_, consent to participate in the research on **Robotic Process Automation adoption in the South African banking industry**.

I am aware that participation is voluntary and that I may choose to withdraw from this study at any time, should I choose to do so.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Appendix F: Ethics consent form

# Commerce Faculty Ethics in Research Application Form

Any person planning to undertake research in the Faculty of Commerce at the University of Cape Town is required to complete this form **before collecting or analysing data**. If any of the questions below have been answered YES, and the applicant is NOT an Honours student, the form it should be submitted to the supervisor (where applicable) and from there for approval by the Faculty EIR committee: Ms Samantha Alexander ([samantha.alexander@uct.ac.za](mailto:samantha.alexander@uct.ac.za)).

It is assumed that the researcher has read the UCT Code for Research involving Human Subjects (Available at <http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf>) in order to be able to answer the questions in this form.

Students must include a copy of the completed form with the dissertation/thesis when it is submitted for examination.

1. PROJECT DETAILS		
<b>Project title:</b> Robotic Process Automation adoption in the South African banking industry		
<b>Principal Researcher/s:</b> Mark Tew	<b>Email address(es):</b>	marktew@hotmail.com
<b>Research Supervisor:</b> Adheesh Budree	<b>Email address(es):</b>	adheesh.budree@uct.ac.za
<b>Co-researcher(s):</b>	<b>Email address(es):</b>	
<b>Department: Commerce:</b> Information Systems		
<b>Brief description of the project:</b> Masters research on the adoption of Robotic Process Automation in South African Banks.		
<b>Data collection:</b> (please select) <b>Interviews</b> <input type="radio"/> Questionnaire <input type="radio"/> Experiment <input type="radio"/> Secondary data <input type="radio"/> Observation Other (please specify): _____		
Have you attached a research proposal OR a literature review with research methodology? (please select)      Yes <del>No</del>		

2. PARTICIPANTS		
2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	<del>NO</del>
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc.) or legally restricted groups?	YES	<del>NO</del>
2.3 Will you be able to secure the informed consent of all participants in the research? (In the case of children, will you be able to obtain the consent of their guardians or parents?)	YES	<del>NO</del>
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	YES	<del>NO</del>
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	YES	<del>NO</del>
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	<del>NO</del>
2.7 Does the research include making payments or giving gifts to any participants?	YES	<del>NO</del>

If you have answered **YES to any of these questions**, please describe how you plan to address these issues (append to form):

**Affiliations of participants:** (please select)

Company employees  
  Hospital employees  
  General public  
  Military staff  
  Farm workers  
  Students  
 Other (please specify): \_\_\_\_\_

**Gender: Are you asking a question about gender in your questionnaire?**

Yes      No

**If you answered Yes to the above - Have you included the option: "Prefer not to answer" as part of your gender question?**

Yes      No

**If you have selected "No" in the question above regarding gender, please explain why:**

**Race / Ethnicity:**

Are you asking a question about race/ethics in your questionnaire?

Yes      No

Which race categories have been used?

**Have you included the option: "Prefer not to answer" as part of your race/ethics question?**

3. PROVISION OF SERVICES		
<p><b>Does your research involve the participation of or provision of services to communities?</b>                      If your answer is YES, please <a href="#">complete</a> below:</p>		
3.1 Is the community expected to make decisions for, during or based on the research?	YES	NO
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	NO
3.3 Will any service be provided at a level below the generally accepted standards?	YES	NO
<p><b>If you answered YES to any of these questions, please describe below how you plan to address these issues.</b></p>   		
3. ORGANISATIONAL PERMISSION		
<p>If your research is being conducted within a specific <u>organisation</u>, please state how <u>organisational</u> permission has been/will be obtained:</p> <p><u>Organisation</u> level approval will be obtained from the <u>organisation</u> (and signed) before the interviews are arranged and conducted.</p>   		
<p>Have you attached the letter from the <u>organisation</u> granting permission? (please select)</p> <p> <input type="checkbox"/> Yes                         <input checked="" type="checkbox"/> No, but this <b>will be</b> obtained before commencing the research                         <input type="checkbox"/> Not applicable                 </p>		
<p>Are you making use of <b>UCT students</b> as respondents for your research? (please select)</p> <p style="text-align: right;"> <input type="checkbox"/> Yes     <input checked="" type="checkbox"/> No                 </p> <p><b>If yes</b>, have you contacted Executive Director: Student Affairs for permission? (please select)</p> <p style="text-align: right;"> <input type="checkbox"/> Yes     <input type="checkbox"/> No                 </p> <p>Was approval granted? (please select)</p> <p style="text-align: right;"> <input type="checkbox"/> Yes     <input type="checkbox"/> No     <input type="checkbox"/> Awaiting a response                 </p>		
<p>Are you making use of <b>UCT staff</b> as respondents for your research? (please select)</p> <p style="text-align: right;"> <input type="checkbox"/> Yes     <input checked="" type="checkbox"/> No                 </p> <p><b>If yes</b>, have you contacted Executive Director: Human Resources for permission? (please select)</p> <p style="text-align: right;"> <input checked="" type="checkbox"/> Yes     <input checked="" type="checkbox"/> No                 </p> <p>Was approval granted? (please select)</p> <p style="text-align: right;"> <input checked="" type="checkbox"/> Yes     <input checked="" type="checkbox"/> No     <input checked="" type="checkbox"/> Awaiting a response                 </p>		
<p>Contact Emails: Executive Director: Human Resources <a href="mailto:Miriam.Hoosain@uct.ac.za">(Miriam.Hoosain@uct.ac.za)</a>                      Executive Director: Student Affairs <a href="mailto:Moonira.Khan@uct.ac.za">(Moonira.Khan@uct.ac.za)</a></p>		

#### 4. INFORMED CONSENT

What type of consent will be obtained from study participants?

- Oral Consent
- Written Consent
- Anonymous survey questionnaire (covering letter required, no consent form needed)
- Other (please specify)

How and where will consent/permission be recorded?

Consent forms will be saved by the researcher and supervisor

Have you attached an informed consent form to your application?  Yes  No

#### 5. SPONSORSHIP OF RESEARCH

**If your research is sponsored, is there any potential for conflicts of interest? No**

If your answer is YES, please [complete](#) below

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	NO
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	NO
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	NO

If you have answered **YES** to any of these questions, please describe how you plan to address these issues (append to form)

## 6. RISK TO PARTICIPANTS

**Does the proposed research pose any physical, psychological, social, legal, economic, or other risks to study participants you can foresee, both immediate and long range?** (please select)

Yes       No

**If yes, answer the following questions:**

1. Describe in detail the nature and extent of the risk and provide the rationale for the necessity of such risks
2. Outline any alternative approaches that were or will be considered and why alternatives may not be feasible in the study
3. Outline whether and why you feel that the value of information to be gained outweighs the risks

1.

2.

3.

**I certify that I have read the the Commerce Faculty Ethics in Research policy**   
 (<http://www.commerce.uct.ac.za/Pages/ComFac-Downloads>)

**I hereby undertake to carry out my research in such a way that**

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	Mark Tew      Signature removed	8 August 2018