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The impact of trust in transformation leadership of the implementation of robotic process automation (RPA)

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ABSTRACT

This study explored the impact of trust in transformational leadership on the implementation of robotic process automation (RPA) which to date has not been widely researched. The study further explored whether if trust was present, its impact was to diminish the fear of job losses. As part of this study, the integrative trust model developed by Mayer, Schoorman & Davis was used to measure trust. To understand these research questions a questionnaire was administered to employees ($N = 313$) of which 224 were considered valid for the purpose of testing. The results of the testing show that there was no relation between trust in transformational leadership on the implementation of RPA, although tests indicate that there is a chance that trust in transformational leadership impacts the implementation of RPA. Similarly, the results showed that there was no relationship between trust in transformational leadership and the fear of job losses but there is a chance that trust impacts the fear of job losses. In addition, the study showed that there were high levels of trust, belief in the implementation of RPA and little fear of job losses. The findings offered support for positive future developments in research and practice whilst understanding the business problem relating to whether trust in transformational leadership can influence the effective implementation of RPA and lead to a decrease in the fear of job losses.

KEY WORDS

Robotic process automation (RPA), transformational leadership, trust, effective implementation of RPA, fear of job losses, affective commitment

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy in Corporate Strategy at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

CONTENTS

LIST OF ACRONYMS

RPA - Robotic process automation

AC – Affective commitment

RP – Robotic process automation

CFA – Confirmatory factor analysis

EFA – Exploratory factor analysis

BOT – Software robots used in RPA

LIST OF TABLES AND FIGURES

CHAPTER 1 INTRODUCTION TO THE RESEARCH PROBLEM

1.1 **Introduction**

Robotic process automation (RPA) is a technology that automates rules-driven business processes to create cost effective, efficient solutions that increase business efficacy (Wilcocks, Lacity & Craig, 2017). In doing so, tasks are replaced which then impacts parts the jobs of employees (Asatiani & Penttinen, 2016; Arntz, Gregory & Zierahna, 2017; Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; LeClair, 2019). For this reason, transformational leadership is required to inspire employees to implement RPA even though they may lose their jobs (Bass, 1999). Transformational leadership is associated with high levels of trust in organisations (Breevaart & Zacher, 2019). This in turn contributes to the success of organisations by encouraging performance since employees are more willing to be vulnerable based on expectations their leaders would act in their best interest (Rousseau, Sitkin, Burt, & Camerer, 1998; Zak, 2017).

Trust is a popular academic study (de Baisi, 2018; Dirks & Ferrin, 2002, Mayer & Gavin, 2005). However, RPA has yet to be studied widely (Hoffmann, Samp, & Urbach, 2019; Syed, et al., 2020). Further to this, there is a dearth of literature on the impact of social elements, such as trust, on the implementation of technology RPA (Skoumpopoulou, Wong, Ng, & Lo, 2018). This study aimed to understand the role of trust in transformational leadership on the effective implementation of RPA. A supporting objective of this study was to examine the role of trust in transformational leadership on the fear of job losses. This topic is increasingly important given the global RPA market was valued at USD 1.4 billion in 2019 with a growth rate of 40,6% expected from 2020 to 2027 (Grand View Search, 2020). By 2021, revenue from RPA is expected to exceed $2.9 billion dollars (LeClair, 2020). However this estimate is likely understated since working from home has called for more automation fuelling more support for automation such as RPA (Gartner, 2020). As such studying RPA could provide benefits to organisations that are implementing RPA.

The increased popularity of RPA is due to the resultant benefits that it provides to organisations (Wilcocks, Lacity, & Craig, 2017). Shareholders benefit through returns on investments due to savings realised from increased operational efficiencies (Lacity & Wilcocks, 2018; Madakam, Holmukhe, & Jaiswal, 2019). Customers benefit from enhanced customer experience since bots can deliver a seamless service with increased speed and quality (Asatiani & Penttinen, 2016; Lacity & Wilcocks, 2018). Employees benefit from RPA implementation since the automation of mundane, repetitive tasks allows them to focus on other work, thereby increasing productivity (Asatiani & Penttinen, 2016; Lacity & Wilcocks, 2018; Madakam, et al., 2019). More importantly, employees benefit if they invest in skills and

training since the demand for high skilled labour increases due to implementation of automation (Autor, 2015; Brynjolfsson & McAfee, 2016). Such benefits can enable the increase of a competitive advantage as companies can leverage these benefits (Brynjolfsson & McAfee, 2016). However, the benefits are only realisable, if RPA is effectively implemented and the probability of a successful implementation is improved if there is trust in leadership (Yue, Men, & Ferguson, 2019). For this reason, it is important to understand the role of trust in the effective implementation of RPA.

1.2 **Description of the problem**

Despite the benefits of RPA, employees experience fear as a result of automation since RPA impacts employment in routine occupations such as services occupations linked to invoice processing, bookkeeping or data entry which can be automated by RPA (Asatiani & Penttinen, 2016; Frey & Osborne, 2017). It does this by impacting parts of jobs that are "structured, codified, routine, predictable tasks" (Davenport, 2015:12). Research has shown that automation impacts one in ten jobs but it is difficult to predict the exact amount of jobs that will be impacted since in many instances parts of jobs are affected by automation, instead of entire roles (Arntz, et al., 2017; Davenport, 2015). However, the uncertainty for employees increases the risk that employees will not adopt the automation due to fear of being replaced (Arntz, et al., 2017; Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; LeClair, 2019).

The World Economic Forum (WEF) estimates that 85 million jobs will be displaced by automation but 97 million new jobs will be created (World Economic Forum, 2020). However, the creation of new jobs will occur over time and the short term effects of RPA may yield a net technology deficit, where more jobs are lost than actually created (World Economic Forum, 2020; LeClair, 2019). It is also unlikely that new jobs will be created for every job displaced, meaning that some employees will be left jobless (Autor, 2015). In other cases, automation will result in a reallocation of jobs (Besson, 2019). This arises because the demand for less skilled labour decreases while there is an increase in demand for higher skilled labour (Autor, Levy, & Murnane, 2003; Brynjolfsson & McAfee, 2016). The employee is affected in both instances, which can create uncertainty and fear.

For the employee, the threat of job losses can detract from the benefits of RPA. As a result, change management and trust in leadership plays a role in supporting employees through the process of change. In this way, change management can enable the implementation of RPA such that organisations are able to redefine their future (Kotter, 1996). Furthermore, change management enables effective implementation of solutions, like RPA, since it

enables employees to adapt to the change introduced by new technology and processes (Breevaart & Zacher, 2019; Khan & Smuts, 2019). Wwithout change management 50% of projects could fail (de Biasi, 2018; Lippert & Davis, 2006). As such the absence of change management may result in RPA solutions not being implemented.

Transformational leaders play an integral role in each phase of change management and can enable the adoption of RPA by helping overcome employee resistance (Kotter, 1996; Lippert & Davis, 2006; Poppo, Zhou & Li, 2016). Such leaders can assist with overcoming resistance from employees who cling to the processes that are comfortable to them (Neves, Almeida, & Velez, 2018). This resistance is overcome by leadership that inspires employees to overcome fears and adopt a change like RPA (Breevaart & Zacher, 2019). In this way, leaders facilitate the creation of an emotional attachment to the change to RPA (referred to as affective commitment) (Agote, Aramburu, & Lines, 2016). The absence of leadership makes it doubtful that employees would willingly implement RPA given that it may lead to their job being made redundant. Affective commitment is related to trust, therefore creating an emotional attachment may improve the likelihood of effective implementation of RPA (Xiong, Lin, Li, & Wang, 2016).

To lead employees through change, trust in leadership is required to ensure that employees automate even though there is fear and uncertainty around their future (Bass, 1999; Kotter, 1996; Kujala, Lehtmaki, & Pucetaite, 2016). Trust is seen as a multidimensional construct that explains how an employee makes themselves vulnerable to leadership to affect change (Mayer, Davis, & Schoorman, 1995). With trust in leaders, employees may be more willing to assume the risk associated with the introduction of RPA, which is the possible displacement of their job (Lippert & Davis, 2006; Mayer, et al., 1995; Neves, et al., 2018). Therefore, in trusting their leaders, automation like RPA can be implemented and the related benefits can be realised.

Trust in leaders can impact attitudes and behaviour and help dispel some of the fear of job losses (Xiong, Lin, Li, & Wang, 2016). It does this by leaders being more active in change and showing genuine concern for their employees whilst also challenging employees to pursue growth and development (Breevaart & Zacher, 2019). This can be achieved by being transparent about the impact of RPA and supporting employees through the change by actively creating opportunities for reskilling (Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; Yue, et al., 2019). Such opportunities include reskilling for roles related to automation or reskilling for roles that RPA cannot do (LeClair, 2019). In this way, employees are able to

feel more secure with the resulting changes from RPA which could mitigate the fear of job losses.

1.3 Purpose of the research

The purpose of this quantitative study was to analyse (1) the role of trust in leadership in the effective implementation of RPA and (2) the role of trust in leadership on the fear of job losses.

1.3.1 Business implications

The effective implementation of RPA in business increases the potential benefits that can be realised which include benefits for shareholders, customers and employees (Lacity & Wilcocks, 2018). These benefits are only realisable if RPA is effectively implemented. Therefore, understanding the role of trust in leadership on the implementation of RPA can enable implementation of RPA within business. Furthermore, business can obtain more insight into RPA that can enhance the change management around the adoption of RPA. This is very relevant as increased adoption of RPA is expected as a result of the popularity of RPA and increase in the need to work from home (Gartner, 2020; Grand View Search, 2020).

The successful implementation of RPA is dependent on employees working side by side with bots or transitioning into new roles (Le Clair, 2019). This success is hampered if employees are fearful that their jobs will no longer exist (Frey & Osborne, 2017). The successful implementation of RPA is also dependent on leaders who are accountable for driving change in the business and dispelling fears of employees (Kotter, 1996). By analysing the responses of employees, this research can help business gain insights into how it can decrease the fear of job losses. It can also provide insights into how employees trust their leaders to lead change, which can be used to improve the implementation and the benefits obtained.

Business has a responsibility to the communities they serve, and hope to redeploy 50% of workers that are displaced by automation instead of laying off workers (World Economic Forum, 2020). To do this, understanding trust in leadership and its impact on effective implementation and job losses, can assist in the effective implementation of RPA whilst supporting employees through the change process. This can be done by business providing opportunities to reskill employees into new roles or into roles that are unique to their human skills (LeClair, 2019). The insights from this study can inform programmes implemented to transition employees to the future of work since it provides more information on the views of employees.

1.3.2 Academic implications

To date, research into RPA has largely centered around case studies aimed at understanding the implementation of RPA in business but there is limited research around the reasons why RPA implementation fails (Asatiani & Penttinen, 2016; Hoffmann, et al., 2019; Lacity & Wilcocks, 2018). The case studies have identified a number of themes within RPA ranging from: outsourcing arrangements, stakeholder buy-in, change management, customer service, the impact on employees and their jobs but no study has looked at the role of the leader enabling this – and how trust affects this (Arntza, et al., 2017; Kokina & Blanchette, 2019; Lacity & Wilcocks, 2015). This study applied trust principles to an aspect of change management (namely trust in leadership) to understand the relationship between the two. In this way it contributes to the academic literature relating to trust and change management.

Change management is important in ensuring that employees adopt the change, but this has not been studied in the context of how trust in leadership impacts RPA adoption (Lacity & Wilcocks, 2018). With the rapid pace of technological change, trust in leadership is needed more as change occurs more easily since trust helps overcome the fear of the unknown (de Baisi, 2018; Lippert & Davis, 2006). By studying whether trust in leadership affects the implementation of RPA, this research addressed a gap in current academic literature on RPA, while using the principles from previous trust research to provide insight into trust and RPA.

This study will contribute to the academic literature related to RPA since scales were developed to measure of the effective implementation of RPA. Development of scales was necessary in this case, since there is a dearth of literature on RPA resulting in the absence of scales to test the effective implementation of RPA (Churchill, 1979). The development of these scales contribute to academic literature since these can be used for other studies. This will contribution to the shortage of RPA studies that currently exist (Syed, et al., 2020).

The 1995 work of Mayer, Davis and Schoorman introduced a multidimensional, conceptual model for examining trust (Mayer, et al., 1995). This model is applicable since it is commonly used in studying trust. Further, this research expanded on other studies which delved into themes of trust and performance, the impact of trust in the social context and trust in teams (Addison & Teixeira, 2020; Baer, Matta, Kim, Walsh, & Garud, 2018; Breevaart & Zacher, 2019; Costa, Fulmer, & Anderson, 2017; Dirks & Ferrin, 2002; Gupta, Ho, Pollack, & Lai, 2016; Harms, Bai, & Han, 2016; Lippert & Davis, 2006; Mayer & Gavin, 2005; Neves, et al,

2018; Poppo, et al., 2016; Rousseau, et al., 1998; Schoorman, Mayer, & Davis, 2007; Xiong, Lin, Li, & Wang, 2016). While these studies exist, there is a dearth of academic studies on how trust in leadership impacts technological change – more specifically the implementation of RPA (Syed, et al., 2020). Therefore, examining trust in leadership and its effect on RPA implementation, would add a new dimension to the model of trust which is applicable to both individuals and organisations. In doing so, this study contributes to the normative literature on trust which is relevant given the rapid implementation of RPA (Brynjolfsson & McAfee, 2016; Skoumpopoulou, Wong, Ng, & Lo, 2018).

1.4 Scope of research

The scope of the research was to understand trust implicitly and explicitly in the context of transformational leadership when investigating the RPA. To do this, trust in leadership in organisations that are implementing RPA as part of their strategy was considered. Trust in leadership as it related to the adoption of other forms of automation, while important, was not included within the scope of this study.

For the purpose of this study, the leaders were defined as line management who could affect operational and tactical decisions and top management who influence culture (Dirks & Ferrin, 2002; Mayer & Gavin, 2005). Such leaders would be considered transformational if they inspire their employees beyond their fears (Breevaart & Zacher, 2019).

The research studied trust in leadership as it related to change management as a result of implementing RPA. Trust is recognised as a two-way construct namely, trust in leaders and trust in employees being affected by the change (Gooty & Yammarino, 2011). This dyadic nature of trust did not form part of the scope of the study. Instead, the study considered the trust that employees had in leadership when implementing RPA as part of its strategy. In addition, the study did not consider the trust that employees had in the technology itself.

Change management is a widely studied construct (Yue, et al., 2019). In this study, change management was considered in the context of trust in leadership. Other elements of change were considered outside of the scope of this study.

1.5 Structure of the paper

The research is structured as follows:

Chapter 1: Introduced the constructs of RPA, change management (specifically affective commitment) in the adoption of RPA and role of trust in leadership. It outlined the research

problem and the business and academic rationale for the study. The scope of the study was clarified.

Chapter 2: Provided an overview of the research related to RPA, change management and trust. The link between these constructs was understood with emphasis on understanding the role of trust and how it may have impacted the implementation of RPA. This was considered in the context of potential job losses due to the implementation of RPA.

Chapter 3: Provided the research questions which followed from the literature review in Chapter 2. In addition, it also outlined the key academic literature that supported this study.

Chapter 4: Discussed the method that was used to test the research question. This chapter included the methodology used to measure scales for the construct RPA implementation.

Chapter 5: Presented the results following the data analysis to provide evidence of response to the constructs central to the research paper.

Chapter 6: Discussed the results obtained from Chapter 5 and interpreted these results in the context of the literature reviewed in Chapter 2.

Chapter 7 – Outlined the principle findings together with recommendations and opportunities for further research.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

The purpose of this research was to discuss how trust, specifically in transformational leadership, impacted the implementation of robotic process automation (RPA). This was further contextualised by researching the role of trust in transformational leadership and the resultant fear of job losses that results from the implementation of RPA. Key to this discussion was therefore the construct of trust and implementation of RPA. In addition, this study also considered affective commitment since it influences the level of trust that employees have (Xiong, Lin, Li, & Wang, 2016).

The chapter commenced by defining RPA together with an overview of how this would be practically applied in organisations. A distinction was then made of RPA from other service-related automation namely cognitive data automation and artificial intelligence (hereafter referred to as AI) since these can be confused with RPA but were outside the scope of this study. The chapter then considered the impact of RPA on shareholders, customers and employees focusing on the impact on employees, since the research focused on how employees' trust in leadership impacted the fear of job losses. The crux of this discussion centred on technological unemployment and how this is mitigated by acquisition of new skills or skills that are uniquely human (LeClair, 2019).

RPA represents a transformational organisational change that requires change management, for employees and for the leadership leading the change, to ensure its successful implementation. Change management was defined with emphasis on resistance of the employee and the role of affective commitment on trust. The leader's role in change management was emphasised since trust in leadership can potentially overcome resistance and enable the effective implementation of RPA. The chapter expanded on the role of trust and introduced the integrative trust model developed by Mayer, Schoorman & Davis (Mayer, Davis, & Schoorman, 1995).

2.2 RPA

2.2.1 Defining RPA

"*Robotic process automation tools are designed to be used by subject matter experts to automate tasks that use rules to process structured data, resulting in a single correct answer – in other words, a deterministic outcome"* (Lacity and Wilcocks, 2016:43). This is consistent with other definitions of RPA which link RPA to using bots to automate structured, rules-based processes (Gartner, 2020). These bots are often confused with physical bots similar to those displayed in pop culture such as C3PO, however the bots are actually software that

has been installed on a computer following the automation process and are not physical robots (Asatiani & Penttinen, 2016; Lacity & Wilcocks, 2015).

Bots perform tasks similar to humans by accessing systems in the same way in which a human does (Asatiani & Penttinen, 2016; Lacity & Wilcocks, 2015). These bots are configured on the front-end of the system with limited change required to the surrounding infrastructure (Hoffmann, Samp, & Urbach, 2019; Osman, 2019). Any exceptions that the bot cannot complete are forwarded to the human for exception handling (Lacity & Wilcocks, 2016). In this way, RPA and humans work together to accomplish goals, each assigned the tasks for which they are ideally suited, for example, the bot processes repetitive tasks and the human manages any exceptions that arise that the bot is unable to handle (Lacity & Willcocks, 2015). Humans have the choice of embracing bots for the benefits that they bring to them or being fearful of them since they could be replaced by them (Le Clair, 2019).

The origin of the word bot is robot, and in the internet sense, synonymous with virtual humans, which is apt since bots automate processes originally performed by humans in the same way a human would by repeating tasks subject to a pre-defined set of rules (Asatiani & Penttinen, 2016; Hoffmann, et al., 2019; Lacity & Wilcocks, 2016). A practical example of this can be provided by reviewing the human task of processing an invoice (Harrast, 2020). In this instance, the bot can process an entry by opening a folder with all the pdf invoices. Once opened, attachments are scanned, and the invoice data is collected. Following collection of the invoice data, the bot accesses the accounts payable system and inputs the invoices one at a time into the transaction screen. On completion of this task, the bot triggers an email with a summary of all transactions it has processed (Harrast, 2020). In this instance, structured data from the invoice is continuously processed using a bot with pre-defined rules (Osman, 2019). This is exactly what an employee would have done except that a bot is able to do the same function faster and at any period in time (Lacity & Wilcocks, 2016).

The tasks automated are often processes that are standardised, have high volumes, are rules-based and where the costs and business rules are understood, but not all of these criteria have to be met (Kokina & Blanchette, 2019; Lacity, et al., 2015). Bots can perform simple tasks but lack the cognitive skills to do more sophisticated tasks (Santos, Pereira, & Vasconcelos, 2019). In this way, RPA is simplistic since it does not require extensive automation (Asatiani & Penttinen, 2016). As a result, RPA represents an opportunity to automate simple processes in business with the result that employees are replaced (Lacity & Wilcocks, 2018).

RPA provides opportunities for automation across both service and manufacturing industries, but as a rule, certain business functions and processes are better suited to automation including telecommunications, insurance, finance, banking, public sector, production of soft drinks and public administration (Osman, 2019). In the telecommunications industry, Telefonica O2 has automated 35% of transactions through the use of 160 bots (Lacity & Wilcocks, 2016). Similarly, Xchanging transformed their business by saving approximately 30% of costs per process by automating 14 core processes (Lacity & Wilcocks, 2016). These automations are examples of a transformation journey through the use of RPA. Within these industries, certain business functions and processes are more suited to implementation of RPA with more accelerated adoption, such as finance and accounting and procurement as compared to others (Lacity & Wilcocks, 2015). This is probably the result of increased repetitive tasks within these industries within back office and front office functions which includes accounts payable administrators, auditing and verification of automation (Harrast, 2020; Le Clair, 2019). This was relevant in this study since most of the data was collected from the financial services industry.

RPA is growing exponentially in the business process automation game, increasing its attractiveness to many business functions (Asatiani & Penttinen, 2016). This is evidenced by increased adoption rates and increased revenue generated by companies selling RPA (Asatiani & Penttinen, 2016, LeClair, 2020). Its attractiveness is the efficiency that can be gained from processing information and its ability to transform businesses (Harrast, 2020). Yet for all its success in deployment within industries, RPA is not a widely researched topic and lacks theoretical foundation to assess it objectively as it relates to its application and development (Syed, et al., 2020). The lack of research is probably the result of RPA still being in a growth phase with its implications for business not fully understood (Hoffmann, et al., 2019).

2.2.2 Clarifying the terminology

RPA falls into the realm of service automation where repetitive tasks are automated (Lacity & Wilcocks, 2015). However, RPA developed as part of an evolutionary process that started from desktop automation which focused on macros with single tasks. From there it progressed to tasks requiring integration on multiple systems working autonomously and performing repetitive tasks that do not require intelligence (Kokina & Blanchette, 2019). In future it is expected that RPA could evolve to perform unstructured non-routine tasks, which is also a form of service automation but is more commonly known as cognitive automation and AI (Hoffmann, et al., 2019; Kokina & Blanchette, 2019). This paper did not consider

cognitive automation and artificial intelligence however, due to this evolutionary process, the discussion of cognitive automation in future could result in increased displacement of jobs as a direct output of this research. In addition, an understanding of these differences helps clarify the scope of the study which focused on RPA which is not suited for highly cognitive, non-routine tasks (Asatiani & Penttinen, 2016).

RPA technology mimics human activity by automating repetitive human tasks using structured data. In this way employees' time is freed up to focus on more complex, value-added work functions (Institute for Robotic Process Automation and Artificial Intelligence, 2019). In contrast, cognitive automation automates or augments tasks using *"inference-based processes on unstructured (and structured) data to produce a set of likely outcomes or interpretations"* (Lacity & Wilcocks, 2018:22). For example, through machine learning, a form of cognitive automation, bots can anticipate process exceptions by identifying missing fields and can access further data to complete the missing fields (Joseph & Craig, 2020). This requires time and the field of automation is still being developed. RPA does not have this capability since the bots possess limited cognitive skills which makes them easier to implement (Syed, et al., 2020).

The table below summarises the key differences between RPA and cognitive automation (Lacity & Wilcocks, 2016).

	Realm of RPA	**Realm of cognitive automation**
Data	Structured	Unstructured
Processes	Rules-based	Inference-based
Outcomes	Single correct answer	Set of likely answers
Used by	Subject-matter experts	IT experts

Figure 1- Difference between RPA and cognitive automation

RPA automates processes and should not be confused with AI which describes various activities ranging from simple automations to the performance of complex algorithmic interpretations (Institute for Robotic Process Automation and Artificial Intelligence, 2019). Instead, RPA is more simplistic and does not perform the enhanced abilities of AI which allow for self-learning, thinking, acting, or interpreting for itself (Institute for Robotic Process Automation and Artificial Intelligence, 2019). However, bots in future may evolve to

reconfigure themselves and create new bots based on methods learnt from bots that are already in production (Hoffmann, et al., 2019). This clarification of terminology is important given that this study considered RPA and did not assess AI.

While cognitive automation and AI were outside the scope of this study, intelligent automation using functionality such as AI and cognitive automation could help companies expand their automation capabilities and could in fact complement or enhance RPA (Instititute for Robotic Process Automation and Artificial Intelligence, 2019). This could result in automation of tasks that could not have been previously automated. This dramatically grows the number of business processes viable for automation, improves automation efficiency overall, and allows companies to stay ahead of the competition (Instititute for Robotic Process Automation and Artificial Intelligence, 2019). However, it increases the number of jobs that can be displaced by automation since cognitive automation may be used in conjunction with RPA in future (Kokina & Blanchette, 2019). The combination of these technologies with RPA could present an opportunity for further studies.

2.2.3 RPA benefits for shareholders and customers

RPA will transform business operations by changing the customer experience, the returns for shareholders and the role of employees (Gover & Duxbury, 2017; Madakam, et al., 2019; Wilcocks, et al., 2019). An example of how RPA created benefits for all stakeholders in an organisation is best described by the case study of Telefonica O2 which automated between 400,000 and 500,000 transactions each month through RPA (Lacity & Wilcocks, 2016). This resulted in decreased turnaround times from days to minutes thereby enhancing client satisfaction and enabling staff to focus on other optimisation opportunities (Lacity & Wilcocks, 2016). For the shareholder, this delivered between a 650% and 800% return on investment over a three-year period (Lacity and Wilcocks, 2018). In this way bots delivered returns to shareholders, increased customer satisfaction and allowed employees to focus on more challenging tasks (Syed, et al., 2020; Wilcocks, 2016). This section considered the impact on shareholders and customers. The impact of RPA on employees is considered separately since the research aimed to understand the role of trust on job losses.

Shareholder value is created by RPA through return on investments, operational efficiencies, improved compliance, improved scalability and increased adaptability to changing requirements (Lacity & Wilcocks, 2018). In this way a competitive advantage is created since businesses are able to implement RPA in their business creating unique processes that competitors cannot easily replicate (Ross, Sebastian & Beath, 2017). As a result, benefits

arise for the shareholder since RPA can result in companies remaining competitive or gaining a competitive advantage facilitating returns for shareholders (Syed, et al., 2020).

Customer value is obtained from RPA through the delivery of seamless services and improving the speed and quality of service (Lacity & Wilcocks, 2018). For example, since software robots are available 24 hours, customers are able to benefit from real-time services and with improved speeds of service execution (Lacity & Wilcocks, 2018). In this way RPA creates service excellence to customers while transforming customer experiences (Syed, et al., 2020). Such engagement builds “customer loyalty and trust” by offering seamless, omnichannel customer experiences, rapid responses to new customer demands, and personalised relationships built upon deep customer insights (Ross, et al., 2017). In addition, RPA has the ability to influence customer journeys by providing the opportunity for them to access more functionality such as comparative shopping (Lacity and Wilcocks, 2018). This will become more imperative as customers continue to demand real-time services (Sparks, 2018).

Even with the benefits, a caution is that the gains from automation for all stakeholders could be diluted if there is inadequate consideration of the governance, risk, and compliance issues that arise as a result of implementing RPA (Harrast, 2020). IT governance for RPA may not be as comprehensive since RPA is often performed outside of normal IT functions, which increases the risk inherent in RPA (Lacity & Wilcocks, 2015). Therefore, it is recommended that RPA governance structures be created to support organisations as they implement RPA (Syed, et al., 2020). This structure should define the operating model to develop RPA, identify the team needed to affect the automation, manage the lifecycle of the project and monitor the performance of the implementation (Anagnoste, 2018). In this way, these structures could mitigate the risk of poor RPA thereby protecting the potential benefits from automation (Syed, et al., 2020).

2.2.4 RPA’s impact on employees

Organisations implement RPA with the expectation that it will improve operational efficiencies and result in decreased costs (Lacity & Wilcocks, 2016). This is achieved since the running cost of RPA software is around one ninth that of a human worker, with further improvements in the accuracy of work (Huang & Vasarhelyi, 2019). Estimates indicated that RPA decreased human resource-related spending by 20–50% due to a decrease in time and cost and human resources, reduction of manual tasks and workload (Syed, et al., 2020). Therefore, the gains from automation are due to a decrease in the number of employees required due to the automation of human tasks (Frey & Osborne, 2017). Such results create

fear for employees that they will be replaced, however, there is also opportunity created as a result of the implementation of RPA (Brynjolfsson & McAfee, 2016; Wilcocks, et al., 2019). The focus of this section was to understand these benefits and risk for employees and explore how this impacted the psychology of employees such as fear, which is often a neglected focus of research (Le Clair, 2019).

Benefits for employees

RPA frees up employees to perform less mundane tasks (Lacity & Wilcocks, 2016). This is accomplished because RPA handles *"repetitive un-stimulating data processing tasks which provide little-to-no job satisfaction"* following its implementation (Wilcocks, 2016: 17). An example of how this was accomplished was highlighted in the Telefonica O2 case with regards to the onboarding of new employees where the human resources specialist would have had to log into multiple systems to set up the new employee including benefits, payroll, email, voicemail, security clearance, office space, computer, with the specialist following standard rules for each routine task (Lacity & Wilcocks, 2016:22). This process could be simplified if a bot is configured to log onto these systems. In this way, the human resources specialists could focus on more critical tasks such as exceptions and non-routine tasks resulting in more meaningful work being performed allowing them to become more creative and use their talents differently (Lacity & Wilcocks, 2016; Le Clair, 2019).

Benefits from RPA implementation require that humans and bots work together (Wilcocks, 2016). If this occurs, productivity of employees increases, while the employee's job is made easier (Lacity & Wilcocks, 2016). In addition, such interaction between RPA and employees can have longer term benefits as bots learn how the human handles complex tasks and reconfigures itself to perform these tasks in future (Van der Alst, Bichler, & Heinzl, 2018). This is part of the evolution of bots that was discussed in Chapter 2.2.2. There is a risk that incorrect decisions could be made by bots but this can be mitigated by the introduction of governance processes, which can include treating bots in exactly the same way as human workers (Anagnoste, 2018; LeClair, 2019; Van der Aalst, et al., 2018).

Technological unemployment

The displacement of employees as a result of the adoption of technology is not a new phenomenon and has existed throughout periods of automation such as the Industrial Revolution (Dodel & Mesch, 2020; Autor, Levy, & Murnane, 2003) John Maynard Keynes called displacement of technology, "technological unemployment" which is *"the sharp decline of labour demand due to technological substitution"* (Marengo, 2019:323). The introduction of RPA creates technological unemployment since employees are likely to be replaced by

bots since bots can do the same tasks faster and with more accuracy (Pham, Madhavan, Righetti, Smart, & Chatila, 2018). However, only parts of jobs will be displaced and therefore the expected number of jobs impacted cannot be predicted (Autor, 2015; Davenport, 2015). The associated uncertainty leads to fear of job loss which was important to this study.

Both routine and non-routine tasks could be automated therefore the impact is on jobs requiring high skills and low skills (Autor, et al., 2003). The automation of these routine and non-routine tasks will lead to roles been replaced by automation. The exact types of job displaced has not been widely studied but more job losses are expected in roles that require lower skilled workers as compared to higher skilled workers (Coupe, 2019; Kurki & Wilenius, 2016; Le Clair, 2019). This is because middle skilled jobs include non-routine tasks that cannot be automated as easily, such as those requiring interpersonal engagement, adaptability and problem solving (Autor, 2015). In contrast lower skilled jobs include repetitive routine tasks such as those in the back office, front office positions, contact centres and data entry functions which can be automated easily (Coupe, 2019; Kurki & Wilenius, 2016; LeClair, 2019).

Opportunities for employees

There is valid fear that automation could displace jobs but there is a potential to create new jobs (Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; LeClair, 2019; World Economic Forum, 2020). RPA creates new jobs because it is easy to use and staff can be upskilled to develop and deploy bots (Lacity & Wilcocks, 2015). Other associated new roles can include bot managers, bot consultants and sophisticated data analysts (Asatiani & Penttinen, 2016). To acquire these skills, employees must have the ability to adapt and learn and be able to deal with change and ambiguity through training and education (Card & Nelson, 2019; Wilcocks, 2016). By doing so they can upskill to new roles which attract higher wages since these jobs are more in demand (Autor, et al., 2003; Dodel & Mesch, 2020). As a result, the fear of job losses is decreased.

Another skill requirement is an understanding of the requirements and unique features of a system before changes (Khan & Smuts, 2019). Humans would need to adapt to embrace such skills and obtain the requisite knowledge, and a failure to adapt would lead to loss of jobs (Frey & Osborne, 2017). Even if employees adapt, job losses may be unavoidable since technological changes can impact more than just manual tasks and could extend to cognitive tasks as well (Marengo, 2019). This could exacerbate the fear faced by employees.

Automation potential is lower in jobs that do not require automation where workers with high education and analytical capability are often employed (Autor, 2015; Arntz, et al., 2017). Employees that are not reskilled for new roles related to automation can be reskilled in their current roles to perform uniquely human skills such as those linked to "creativity, problem-solving skills, judgment, and emotional intelligence" (Arntz, et al., 2017; Card & Nelson, 2019; Lacity & Wilcocks, 2016:48). These human skills are likely to keep bots inferior to humans and therefore jobs related to these skills could remain unaffected by the implementation of RPA (Brynjolfsson & McAfee, 2016). Employees in these roles would have a lower fear that their job would be replaced since a bot is not able to handle roles that involve unstructured, cognitive skill, which a human is able to do (Coupe, 2019).

Studies supported the view that employees that were more educated were more optimistic about the impact of automation on their jobs (Dodel & Mesch, 2020). Leadership has a role to play in ensuring that there are platforms over which employees can acquire this education (Card & Nelson, 2019). Leadership plays a role to motivate employees to adopt automation; motivate employees to adapt their skills and provide transparency about the changes that would be brought by automation (Breevaart & Zacher, 2019; Marengo, 2019; Yue, Men, & Ferguson, 2019). This requires trust in leaders, which can be built through a track record of the creation of new job opportunities (Piderit, 2000). Very often the intention is to emphasise the creation of new skills for employees, but this does not materialise (Wilcocks, 2016). This can impact the integrity of management since they fail to act in the best interests of employees even after committing to such (Mayer, et al., 1995). Therefore, leaders that create evidence from observable past behaviours and future intentions to act by preventing job losses can enable the effective implementation of RPA.

While new skills can be created and existing employees can be reskilled to perform their roles, there are still instances where job losses are inevitable (Arntz, et al., 2017; Le Clair, 2019). Such job losses are expected in roles that are highly susceptible to automation such as: jobs in the service industry, office and administrative support workers, and employment in production occupations (Frey & Osborne, 2017). In this instance, employees fail to adapt to automation through reskilling and reliance on their human skills. As a result, such workers do not make the transition because they lack the skills, attitude or ambition to explore the emerging roles that arise (LeClair, 2019). As a result, these employees lose their jobs.

RPA does not automatically result in a decrease in the workforce and often results in humans and bots working together with resultant benefits such as an increase in productivity, that results in increased customer and employee satisfaction (Asatiani &

Penttinen, 2016). Even with this view, there is a fear that automation will replace workers and case unemployment, particularly in roles and sectors of society that are more susceptible to automation (Dodel & Mesch, 2020). Such vulnerabilities exist in employees with lower skills, lower education and ultimately employees that are not able to adapt to automation (LeClair, 2019). Such employees could benefit from change management when implementing RPA.

2.2.5 Summary of RPA

RPA will automate various repetitive tasks with many benefits for stakeholders, including shareholders, customers and employees. These benefits are directly linked to effective implementation of RPA and ultimately translate to an employee's role being easier, increased productivity and time to focus on higher quality work (Lacity & Wilcocks, 2016).

While an understanding of RPA and these benefits is important, the resultant technological unemployment that is the inevitable result of automation, ultimately results in fear (Arntz, et al., 2017; Marengo, 2019). This fear is mitigated when leaders provide opportunities for employees to upskill and reskill in their current roles but still there is risk that employees may lose their jobs as a result of the implementation of RPA. This fear of job losses can affect the effective implementation of RPA.

2.3 RPA driving organisational change

The introduction of RPA is an organisational change which moves an organisation from "*their present state to some desired future state in order to foster the achievement of one or more organisational objectives"* (Agote, Aramburu, & Lines, 2016:37). With RPA these changes relate to the adaptation to a new automated environment to achieve benefits which ultimately result in a competitive advantage for the organisation (Luo & Jiang, 2014; Lacity & Wilcocks, 2016; Skoumpopoulou, et al., 2018). These changes will leave a lasting change in the lives of those impacted by the change such as employees who are at risk from being displaced by automation (Arntz, et al., 2017; Burnes, Hughes, & By, 2018).

To effect the change requires change management initiatives that moves employees to this desired state to ensure that the change objectives of an organisation are met. Change management is the approach that management undertakes to introduce new methods, models and processes which support organisations in developing a competitive edge (Khan & Smuts, 2019: 2001). With RPA the change is the introduction of new methods of work as human tasks are transitioned to automated tasks (Lacity & Wilcocks, 2016). The model of operations changes since the introduction of RPA would require the creation of centres of

excellence which provide standards of implementation (Kokina & Blanchette, 2019). In addition, the processes which support organisations will change from manual to automated (Wilcocks, et al., 2019).

To transition to RPA, change management practices guide the organisation through the confusion and transition to RPA (Xiong, et al., 2016). Change management is required to introduce employees to RPA and to prepare employees for the changes brought on by the introduction of RPA. In addition, change management is required by leaders, who played a key role in ensuring that employees accepted the changes implemented by RPA. Change envisaged for RPA is a collaborative process that required the involvement of all parties impacted by the change, which in the case of RPA included the employee and the leader affecting the change (Lewin, 1997). Organisational leadership and change are symbiotic and work together to achieve organisational change (Burnes, Hughes, & By, 2018). Leadership is responsible for creating a vision for the future, obtaining commitment to this vision by employees and inspiring employees to make the change amidst obstacles that exist (Kotter, 1996). However, even though change management principles exist, there is still failure present in projects, either because people are not applying good practices of change management or the focus on practices and processes diluted the importance of others critical elements that drive change (Herold, Fedor, & Caldwell, 2007).

The commonly adopted change process is the Lewin process for change which stated that the change process is one of unfreezing, freezing and refreezing an organisation (Lewin, 1997). Unfreezing involves moving away from the hardened beliefs that exist for the change (de Baisi, 2018; Lewin, 1997; Lippert & Davis, 2006). For example, employees could believe that RPA is a physical bot that may replace them (Wilcocks, 2016; Lacity & Wilcocks, 2018). These hardened beliefs would make them reluctant to adopt change and leaders need to enable these fears to be overcome. Once done new practices are adopted which is accompanied by freezing which is testing the new changes which is likely when the process is automated (de Baisi, 2018; Lewin, 1997; Lippert & Davis, 2006). These new practices could include processes for humans and bots working toghther and for reskilling for new roles. Following the adoption of practices, refreezing is applied to embed the changes such as it becomes part of the routine (de Baisi, 2018; Lewin, 1997; Lippert & Davis, 2006).

The Lewin model was expanded by Kotter (1996). In terms of this model, the process for creating major change has been extensively studied and can be categorised as (1) creating a sense of urgency for the change, (2) creating a guiding steerco to affect change, (3) developing vision and strategy, (4) communication of a change vision, (5) empowering action

by taking risk and removal of obstacles, (6) generating short-term wins, (7) consolidating the gains and producing more changes and (8) anchoring the approaches in the culture (Kotter, 1996). This model was used to understand the requisite change management needed to implement RPA and highlight the role of leaders in this process as articulated in Chapter 2.3.1.

Failing to implement a change management process to prepare employees can lead to conflict between management and employees which could affect the employee morale leading to an unwillingness to implement RPA (Asatiani & Penttinen, 2016). In addition, improper change management in the adoption can lead to failure in the implementation of RPA since employees will not adapt to the change and without employees, automation is not possible (Brynjolfsson & McAfee, 2016). This is a key risk that is often not adequately addressed in RPA implementation (Santos, et al., 2018). In practice, lack of change management could derail around 50% of system changes fail because they do not meet the design expectations of stakeholders (Lippert & Davis, 2006). This is true for RPA where 30% to 50% of all RPA projects fail (Osman, 2019). The results of a failure to implement is that shareholder, customer and employee will not benefit from the implementation of RPA (Wilcocks, et al., 2019).

2.3.1 The role of leadership in organisational change

RPA is considered to be a transformational change (Lacity & Wilcocks, 2016). Transformational change requires transformational leaders who are responsible for inspiring, supporting and challenging their employees to adopt changes amidst fears (Breevaart & Zacher, 2019; Lippert & Davis, 2006, Mayer & Gavin, 2005). The implementation of RPA requires leaders that move followers beyond their fears "*through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration"*, and are not motivated by self-interest (Bass, 1999:11; Poppo, Zhou & Li, et al., 2016; Yue, et al., 2019). Transformational leadership plays a part in articulating the change needed for the implementation of RPA and leading teams towards this change (Bass, 1999).

Leading team towards change can be accomplished by setting the strategic direction for RPA and facilitating an automation attitude – a mindset that is open to change (Joseph & Craig, 2020). The starting point for this is creating a sense of urgency around the implementation of RPA. The urgency in the case of RPA can be linked to the expected benefits that can be derived from RPA, with emphasis on how employees benefit (Wilcocks, et al., 2019). However, the threat of job losses cannot be ignored and the sense of urgency should include the imperative for employees to transition their skills to those of the future.

To affect change, requires a guiding steerco that is responsible for the implementation of changes (Kotter, 1996). In the case of RPA, this requires a committee responsible for the change which takes the main decisions with regards to operating of RPA and the implementation of change. The team will comprise of team members where there are clearly defined roles and responsibilities and skills to implement the change. Boundaries and pre-defined rules of operation will be required to be part of the guiding steerco to implement the change (Anagnoste, 2018). Leaders would be responsible for creating this steerco which leads the change.

Leaders through the steerco would then develop the vision and strategy which creates an opportunity for employees to embrace RPA and see it as a potential to achieve personal growth (Yue, et al., 2019). This is a snapshot of the future combined with rationale on why someone should pursue this future and it is important to create alignment between leaders and employees (Kotter, 1996). The vision created for RPA would include a view of a future where routine, manual tasks are automated in pursuit of job satisfaction, higher learning, improved client experience and a competitive advantage (Lacity & Wilcocks, 2016). However, this future also comes with the risk that employees may be left unemployed if these changes materialise (Brynjolfsson & McAffee, 2019; LeClair, 2020). The vision and strategy can outline the future for employees thereby decreasing their fear of automation.

This vision should cater for the requisite change in mindset that is required to entice employees to adopt RPA amidst job losses (Brynjolfsson & McAffee, 2019; Joseph & Craig, 2020). Leaders play a role in enabling a changed mindset by creating a clear vision and strategy for change and empowering employees with the skills necessary to make the transition (Herold, et al., 2007; Kotter, 1996). Here the leader inspires employees to pursue the future with the benefits of RPA highlighted to motivate followers to adopt RPA and achieve the shared purpose of the organisation, amidst the threat of job losses (Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017). These leaders are a source of support and influence employees to challenge the status quo and they promote the pursuit of education and innovation so critical for the transition to RPA (Yue, et al., 2019).

The implementation of RPA involves risk for many reasons including the risk of potential job losses (LeClair, 2020). Part of the change plan involves empowering employees to take the risk and removing obstacles to enable the implementation (Kotter, 1996). Transformational leadership plays a role since it requires employees to adopt the change despite the risk to their job (Breevaart & Zacher, 2019). In this way leaders empower action by driving the

adoption of risks. Leaders could empower action by providing platforms that allow them to adapt to the changes that are the result of automation (Brynjolfsson & McAfee, 2016). This can be done by making an investment in skills and enabling employees to acquire skills of the future that result from automation (Autor, 2015; LeClair, 2020). Alternatively, this can be accomplished by allowing them to harness the skills that are uniquely human (LeClair, 2020). Leaders need to guide employees through these changes. Without this guidance, the fear that employees feel could be exacerbated.

Leaders lead change by their responsibility for leadership communication of the change vision to stakeholders (Kotter, 1996; Yue, et al., 2019). The communication for employees should provide transparency as to the nature of RPA, the benefits of RPA, the impact on employees and the reskilling of employees to develop bots. It could also include changes to work due to the introduction of bots and the management of a digital and human workforce (Addison & Teixeira, 2020; Burnes, et al., 2018; Lacity & Wilcocks, 2018). This creates a shared understanding of what the entity is trying to achieve through the implementation of RPA. Communication to employees can help decrease the fear of job losses as a result of deployment of RPA by reinforcing the shared purpose of RPA (Frey & Osborne, 2017; Herold, et al., 2007). The communication strategy was not a focus of this study even though it likely increases trust, and trust is closely linked to the perceptions of employees.

Change is a process that often takes time, but part of this process involves generating short-term wins, consolidation of the gains and producing more changes to effect change (Kotter, 1996). Telefonica O2 highlighted the steady change process over years which resulted in implementing RPA in 35% of their processes (Lacity & Wilcocks, 2016). A lengthy wait for the result of the implementation would not have inspired employees to continue with the change. Leaders are responsible for ensuring that the change generates short term wins which can reinforce the benefits of the change (Kotter, 1996). In addition, short term wins can be consolidated and further opportunities to enhance the implementation can be identified (Asatiani and Penttinen, 2016). In this way, the change process is constantly being developed to ensure that the optimal result is derived (Kotter, 1996).

Leaders play a role in embedding RPA as part of the culture (Yue, et al., 2019). This is accomplished by adopting a new set of practices that allow the sustainability of the change. In the case of RPA, this may be achieved over time given that the transformational plan occurs gradually (Lacity & Wilcocks, 2016).

2.3.2 Employees resisting the change

Even with transformational leadership, resistance to transformative changes still arises and is assumed to be the result of individuals being uncomfortable with venturing into unfamiliar territory (Lippert & Davis, 2006; Poppo, et al., 2016). For example, employees comfortable with mundane, repetitive tasks are unlikely to embrace adoption of RPA (which is new and could replace them). Their fear may also make them reluctant towards RPA changes. Understanding resistance was important in this study since the cognitive aspects of resistance are linked to the attitude of the employee towards the change and the feeling of confidence (or no trust) in the leaders affecting the change (Jones & Van de Ven, 2016). Without this trust, the change to RPA would be more challenging since it becomes difficult to motivate employees towards the shared objective or even generate support to change to RPA (Agote et al., 2016). As a result, the willingness of employees to adopt change impacts the implementation of RPA.

It is recognisable that changes such as those brought about by RPA may not be accepted by employees (Hechanova, Caringal-Go, & Magsaysay, 2018). The decision to support the beliefs in the benefit of change is called affective commitment, which is the emotional attachment employees feel towards the change evidenced by their involvement in the organisation and their level of satisfaction towards the change (Hechanova, et al., 2018). Affective commitment shows the readiness of an employee for change and negative affective commitment can detract from the changes that are being implemented with regards to RPA.

Affective commitment to organisational change is rare and employees are often cynical when they encounter change which impacts the success of the change (Herold, et al., 2007). Such resistance is likely in the case of RPA since there is a risk of job losses. This could mean that the employee does not have the changed mindset to allow the changes, which adversely impacts the implementation of RPA (Hechanova, et al., 2018). In addition, previous experiences in implementing technological changes may have been unfavourable and may have created negative emotions which means that employees would be less willing to implement RPA (Jones & Van de Ven, 2016). For example, observations of previous automation and its impact on jobs and the actions of their leaders would impact their inclination to adopt RPA. Understanding these fears directly impact the research question since low affective commitment can hamper effective implementation of RPA.

The negative emotions associated with change create uncertainty and stress, and result in employees being more conscious of the change (Men, Yue, & Liub, 2020). This is especially likely with RPA where the expected technological unemployment is inevitable (LeClair, 2020). However, leadership that is supportive can decrease the resistance of employees

over time as relationships strengthen (Jones & Van de Ven, 2016). Furthermore, employees trust in leadership is understood to have a positive relation to affective commitment (Xiong, et al., 2016). This means that the higher the level of trust in leaders, the greater the likelihood of successful implementation of RPA. For employees to trust, they must believe in the benefits of major changes brought on by RPA and be willing to trust their leaders to make this change (Neves, et al., 2018).

Employees' support and enthusiasm for change, instead of resistance, enables effective implementation of change (Piderit, 2000). Resistance is strongly linked to trust since the ability to change a mindset and accept a difference is closely related to the amount of trust that the employee has in leadership (De Baisi, 2018; Lippert & Davis, 2006). Trust in leader is one of the major antecedents of employees' change-related attitudes and behaviours and influences the ability to achieve effective change, such as RPA implementation (Men, et al., 2020). Employees who trust leaders believe that there is an alignment between their objectives and the objectives of the organisation, and this is important when implementing change (Yue, et al., 2019). The existence of a trusting relationship increases the probability of successful implementation while a lack of trust fuels resistance to the change and can affect the successful implementation of trust (Yue, et al., 2019). This discussion was relevant for this study that focused on how trust in leadership impacted the effective implementation of RPA. Trust is unpacked further in this chapter (refer to Chapter 2.4).

2.3.3 Summary of change management

The current climate in which we operate is constantly changing and adapting to changes is critical for future survival (Brynjolfsson & McAfee, 2016). To ensure that such change is sustainable for employees, change management is needed. However, the role of the leader in this process is evident in every phase of this change. The leader's role to implement change in closely linked to trust in leadership and without employees' trust, it is unlikely that organisations will achieve the shared objectives of implementing RPA (Agote et al., 2016).

2.4 Trust in leadership driving change management for RPA implementation

Trust in leadership plays a key role in the change management process since higher adoption rates are possible if employees trust their leaders (de Baisi, 2018; Kotter, 1996; Men, et al., 2020; Lippert & Davis, 2006). The purpose of this research was to evaluate the trust placed in leadership using criteria linked to the Mayer, Davis & Schoorman (1995) model. This was then correlated against the effective implementation of RPA to understand if there was a relationship between the two constructs. The research used the Mayer-Schoorman model but built from the studies of Dirks & Ferrin (2002) and Mayer & Gavin

(2005) which found that trust played a role in performance. This was tested but in the context of RPA, further to this when employees trusted their leaders, it was likely to dispel any fears that they had (Edelman, 2020). For these reasons, understanding trust was important to this study. This section defined trust in leadership and explored how it is established.

2.4.1 Understanding trust

There are many ways to define trust but there is no unified definition (Addison & Teixeira, 2020; Costa, et al 2017; Schoorman, et al., 2007). Most definitions include that trust is strongly linked to the leader's character and the influence it has on an employee (Mayer, et al., 1995; Rousseau, Sitkin, Burt, & Camerer, 1998). Other definitions focus on how the follower understands the relationship (leader–follower relationship) (Dirks & Ferrin, 2002). For the purpose of this research, trust was defined as: "*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another"* (Rousseau, et al., 1998:395). This led on from the research of Mayer, et al. (1995:712), which proposed that trust was the *"willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party"*. This work was acceptable for this research since it provided an integrated model for trust that could be used across multiple contexts when implemeenting RPA (Schoorman, et al., 2007).

Within this study, trust was considered in the context of the relationship between the employee and transformational leadership, linked to the inherent fears of job losses. However, the trust that employees place in leadership also impacts the effective implementation of RPA (Gooty & Yammarino, 2011). For the purpose of this study, dyadic relationships looking at trust from the perspective of trustee *and* trustor, was outside the scope. In addition, technology trust which is dependent on *"expectations of technology predictability, reliability and utility and influenced by the individual's predilection to trust technology"* was not considered as part of this study (Lippert & Davis, 2006: 438). This was excluded from the scope since RPA which automates repetitive tasks and increases the efficiency of the area in which it is implemented makes concerns around the "*predictability, reliability and utility"* of the software less of an issue. In addition, the focus was more on the human element of the implementation (in this case trust), which is a neglected area of research (Skoumpopoulou, et al., 2018).

To reiterate, RPA represents an organisational change for which change management is necessary to achieve the benefits associated with its implementation. Higher levels of trust in

leadership have been shown to improve the success of change management (Yue, et al., 2019). In addition, higher trust levels can also positively impact the implementation of RPA (Dirks & Ferrin, 2002; Addison & Teixeira, 2020).

2.4.2 A model of trust

The integrative model of trust developed by Mayer, Schoorman and Davis was used within the context of this research paper (Mayer, et al., 1995). This model represents a cognitive view of trust and can be extended to interpersonal trust defined as a judgment made in a specific context that changes as more information is received (Schoorman, et al., 2007). A cognitive view of trust was ideal for this study which considered the trust in transformational leadership which led to implementation of RPA (task performance) (Tomlinson, Schnackenberg, Dawley, & Ash, 2020). Furthermore, the model selected was generalisable to the broadest number of contexts, which made it more robust (Schoorman, et al., 2007). However, given the multidimensional nature of trust, it is possible that there are additional factors linked to trust which could have impacted the results from this study (Dirks & Ferrin, 2002). These factors were not explored further since it is not core to this study.

Within the realm of cognitive trust, individuals are evaluated on how they will behave in certain situations (de Baisi, 2018; Lippert & Davis, 2006). Such trust is relational in nature (such as between leadership and the employees within the environment in which RPA is being deployed) and arises from repeated interaction which more likely results in parties considering each others' interests as if they were one (Costa, et.al., 2017, Poppo, et al., 2016). The alignment of the vision (a part of change management) is likley to create alignment in the objectives which will strengthen trust (Kotter, 1996; Men, Yue, & Liub, 2020). In the context of this research, this translated into leaders considering that employees could potentially have lost their jobs, as if they themselves could have lost their jobs by the implementation of RPA. Based on this consideration, leaders would have acted differently when implementing RPA.

An overview of the integrative model of trust developed by Mayer, Schoorman and Davis is depicted in the figure below (Mayer, et al., 1995).

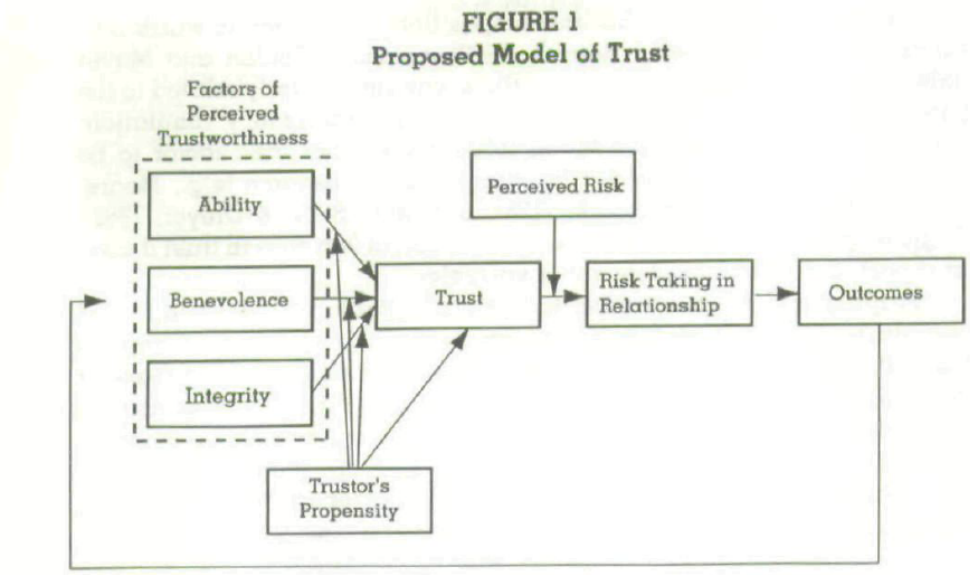


Figure 2 - Integrative model of trust

2.4.3 Factors of trustworthiness

When understanding the role of trust in the effective implementation of RPA, trust is understood to be a multidimensional construct with the factors of trustworthiness being *"ability, benevolence and integrity"* (Mayer, et al., 1995). These factors of trustworthiness can be linked to competence, reliability and dependability (Costa, et al., 2017). The existence of all of these "*ability, benevolence and integrity"* in a relationship is likely to demonstrate a high trust relationship, but should be looked at on a continuum of ranges (Mayer, et al., 1995). The range would be greater if employees believe that their leaders would act in their best interest and that their leader cares for them (Rousseau, et al., 1998). Furthermore, these factors grow over time with the result that trust could be lower in newer relationships (Men, et al., 2020; Tomlinson, et al., 2020).

While these three factors of trustworthiness are often combined under one construct of trust, this research paper considered each of these three subconstructs when considering how trust in leadership impacts the effective implementation of RPA (Legood, Thomas, & Sacramento, 2016). This was done to assess if there were certain elements of trustworthiness that are displayed in a relationship with effective implementation. Such information could be used to assess whether there were areas that needed to be considered differently when looking at trust.

Ability

Abillity is the "*group of skills, competencies and characteristics"* that would enable the leader to have influence in RPA (Mayer, et al., 1995:717). This means that employees would be

more willing to trust leaders if these leaders have the skills and competence linked to RPA (Wilcocks, 2016). RPA is easy to understand and implement, therefore it is expected that leaders would have the requisite skills relating to RPA. A leaders ability is evidenced by interactions with the leader which allow the employee to assess his skills as they relate to RPA (Baer, et al., 2018). However, ability could also be conveyed when a leader engages employees, since they could demonstrate that they were able to delegate and share control (Legood, et al., 2016). Ability could also be demonstrated in the change plan as leaders provide observable evidence of change (Piderit, 2000).

Benevolence

Benevolence is the abilty to act in the best interest of the employee and can be linked to the care that the leader has for the employee (Mayer, et al., 1995; Mayer & Gavin, 2005, Poppo, et al, 2016). In this case, trust is formed through an attachment where parties consider each others' interest as if they were their own (Poppo, et al, 2016). In this study, this can be translated to leadership acting as if their job could be displaced by RPA. In this way, leaders could empathise with employees. Benevolence is linked to transformational leadership where leaders are not influenced by self-interest (Bass, 1999). Instead, leaders display a deep interest in the wellbeing of their employees and facilitate the development of mindset that is open to change (Joseph & Craig, 2020).

Leaders who show care and concern for employees who may be replaced by a bot are likely to show higher levels of benevolence than other leaders (Legood, et al., 2016). Benevolence is also displayed by leaders who provide open and honest communciation to employees about the RPA journey, including the potential impact that it may have on them (Mayer, et al., 1995; Wilcocks, et al., 2019). As noted in Chapter 2.3.1, leadership has the responsibility for communicating change to stakeholders (Kotter., 2016; Yue et al., 2019). Communication could include the impact of jobs and plans for change. Such instances of communication would translate to higher levels of trust since it shows that leaders genuinely care thereby influencing change management and having a positive impact on change (Legood, et al., 2016; Yue et al., 2019).

Benevolence does not appear as quickly as ability and integrity and grows over time, meaning that in the case of RPA, it may be evident as more implementations of RPA occur (Schoorman, et al., 2007). Also, it may be more evidence if employees and leaders have a long period of workign together (Tomlinson, et al., 2020).

Integrity

Integrity is the belief that the leader would adhere to a set of principles that is acceptable to employees (Mayer, et al., 1995). In this case, the leader would adhere to the new methods, models and processes inherent in change management and would implement changes to support employees (Khan & Smuts, 2019). This could be demonstrated by a willingness to reskill employees for the new roles brought on by automation or by reskilling employees for uniquely human skills in their current roles, even if there is no risk of job losses (Neves, et al., 2018). This can be measured by assessing the leaders current and previous behavior (Mayer, et al., 1995; Piderit, 2000). For example, if previous implementation of RPA resulted in job losses, the leader would find it very difficult to instill trust in their employees that this situation would not be repeated. This is because the integrity of the leader could be in doubt.

2.4.4 Conditions for trust

Risk and interdependence are the two necessary conditions for trust (Rousseau, et al., 1998). The definition of trust proposed by Mayer, et al. (1995), asserted that trust related to the willingness to take risks and interdependence. Trust involves interdependence since it requires people to work together to achieve organisational goals, in this cased RPA implementation (Mayer, et al., 1995).

Risk

Risk taking in the relationship between employees and their leaders is caused by an interaction between trust and risk (Mayer, et al., 2007). There would be no reason to trust leaders when deploying RPA unless there was associated risk (Rousseau, et al., 1998; Schoorman, et al., 2007). The risk in this case is related to the potential job loss resulting from RPA implementation (Frey & Osborne, 2017). An employee would be willing to take the risk of losing their job due to RPA because of the trust that they had in their leader. Trust indicates the risk that employees are willing to take, with increased trust indicating increased levels of risk (Schoorman, et al., 2007). The perception of the employee taking the risk would impact the trust relationship, because if the employee believed that there was no risk, there would be no need to trust their leader (Schoorman, et al., 2007).

In RPA, risk exists because there is uncertainty as to whether the leader would act in the best interest of the employee by reskilling them or would in fact support the loss of jobs (Rousseau, et al., 1998). Added to this is the increase in risk and uncertainty as a result of complexity involved in decision-making which is linked to trust (Kurki & Wilenius, 2016). Therefore, employees are afraid of implementing RPA since they believe it will replace them (Kujala, et al.,2016). Risk taking could produce success or failure (Kotter, 1996). Leaders encourage employees to take the risk with the result that they can be relieved of manual

repetitive tasks, a new job could be created, or no job could exist resulting in job losses (Mayer & Gavin, 2005; Schoorman, et al., 2007). This is part of the change management process highlighted in Chapter 2.3.1.

The relationship that employees have with their leaders could help alleviate some of this fear resulting in employees assuming the risk, increasing the chance that the organisation will achieve its goals (Kujala, et al., 2016). Employees are also likely to feel more settled if leaders communicate the consequences of automation, which may be job losses or job creation as mentioned previously (Arntz, et al., 2017; Lacity & Wilcocks, 2018; LeClair, 2019; Yue, et al., 2019). Leaders would need to frame communication with employees in a transparent way (Wilcocks, et al., 2019; Yue, et al., 2019). This influences trust since it provides additional data and evidence of how leaders are affecting change (Wilcocks, et al., 2019; Dirks & Ferrin, 2002). However, it carries more weight when there is evidence of creation of periods of stability rather than when there is constant change (Neves, et al., 2018). For example, an employee is more likely to trust that one is committed to creating new roles, when one has commenced doing it before there was any need for job losses. This shows the leader's commitment to supporting employees to the changes making it easier for employees to assume risk.

Change is acknowledged to be painful and risky (de Baisi, 2018). Leadership action can result in employees being more open to change through change management practices (Kotter, 1996). In this way change management can enable employee to take the risk.

Interdependence

Interdependence refers to the dependence of one party on another to achieve the objectives (Rousseau, et al., 1998). It is the employee's belief that the leader will do what they indicated they would do (Schoorman, et al., 2007). For the context of this study this interdependence is between the employee and leader. For RPA implementation to be successful, leaders must execute on the change plan developed as identified in Chapter 2.3.1. The biggest concern of employees appears to be the fear of job losses (Lacity & Wilcocks, 2018). Leaders action influences the outcome of this concern since they are integral to change management (Yue et al., 2019). As such employees are interdependent on leaders.

Interdependence can be linked to support or mutuality where parties are so aligned that they work towards a common goal, adapt to changes timeously and there is a decrease in self-fulfilling behaviour (Poppo, et al., 2016). Such behaviour leads to higher levels of trust. This is a key step in the change management process and is necessary to build alignment

between employee and leaders when implementing change (Kotter, 1996). When such alignment exists, there is a shared vision of the change which dispels the fear of job losses

2.4.5 Propensity to trust

An employee's propensity to trust is the employee's willingness to trust others (Mayer, et al., 1995). This can be further defined as the *"inclination, bias, or desire to trust people"* (Covey & Link, 2012:58). In this instance, it would represent the employee's willingness to trust leaders to make the right decisions as they implement RPA. Without this willingness to trust, employees would not be vulnerable to the behaviours of their leaders and there would be no trust relationship (Rousseau, et al., 1998).

The propensity to trust varies amongst different individuals and must be looked at in conjunction with the factors of trustworthiness explained in Chapter 2.4.3 Factors of trustworthiness. However, it is understood to have arisen from personal experience or conditioning (Covey & Link, 2012). A high propensity to trust would mean that an employee's personal experience and conditioning ensures that there is a low risk that an employee may lose their job if RPA is implemented. In fact, it may suggest that RPA is good for an employee since it allows them to focus on other tasks (Wilcocks, et al., 2019). This decision is largely a function of what is in an employee's heart, but it is shaped by their interaction with management. For this study, the propensity to trust was not explored since it was not central to the research question.

2.4.6 Other dimensions of trust

Another dimension of trust is linked to the social context of trust which refers to an employee's tendency to trust (Baer, et al., 2018). The social context of trust has foundations in affective trust which is derived from strong bonds and feelings for another person (Harms, et al., 2016). Affective trust takes into account the fact that emotions around RPA or the behavour of the leader would impact the trust relationship (Costa et.al., Tomlinson, et al., 2020). (Schoorman, et al., 2007) concluded that emotions that impact the trust relationship dissipate over a period of time, but there is uncertainty as to whether this would completely dissipate. For the purpose of this research, affective trust was not considered since interpersonal and technology trust were essential for technology adoption, such as RPA (Lippert & Davis, 2006).

Time plays a role in the trust relationship with trust growing over time (Men, et al., 2020; Mayer et al., 2007). Swift trust considerations in RPA are possible at the commencement of the employee-leader relationship, but longer relationships may be more relevant when

considering the impact on the trust relationship (Schalke and Huang, 2018; van der Werff & Buckley, 2014). In the early stages of a relationship, high supervisor ability, benevolence, and integrity are sufficient for trust in relationship but over time there is a need for a high propensity to trust to develop (Tomlinson, et al., 2020). For the purpose of this study, the length of the trust relationship was not explored when considering how trust impacted the implementation of RPA. However, it is possible that where an employee is relatively new to an organisation, the benevolence quality of trust may not yet have developed (Mayer et al., 2007). This could be an area for future research.

2.4.7 Summary of trust

Trust in leadership is an important part of change management that could derail the effective implementation of RPA (Mayer, et al.,1995). Trust is considered to be a multidimensional construct that comprises of ability, benevolence and integrity. Together these three sub-constructs contribute to whether employees trust their leaders to affect change on their behalf.

2.5 Conclusion

RPA is a service automation technology that is gaining increased popularity within many industries. The technology is able to automate routine, manual and repetitive tasks with candidates for automation being rules-based processes (Lacity & Wilcocks, 2016). The benefit of automation for employees is that it frees up capacity to allow them to focus on more beneficial tasks, while also removing their frustration (Harrast, 2020). However, with these benefits comes risk due to the potential of losing their jobs, which is an inevitable consequence of all automation.

This fear could impact the ability of employees to embrace RPA. To mitigate this risk, change management initiatives could help ready the employees for the change with leaders providing strategic direction to enable the changes that arise due to implementation of RPA. Leaders play a role in change management with effective change management leading to higher levels of trust (Men, et al., 2019; Yue, et al.,2020). For the purpose of this study, the role of leadership was critical due to its relationship to change management and trust (Men, et al., 2019; Yue, et al.,2020). However, there is a need for employees themselves to commit to the change. Here affective commitment which represents the employees' willingness to embrace the change plays a role in implementation of RPA. Affective commitment has a positive relationship to employees' trust in leadership (Xiong, et al., 2016).

Leading on from affective commitment, trust in leadership is the intention of an employee to accept vulnerability based on the intentions and behaviour of management to act in their best interest (Rousseau, et al., 1998). Trust is an important antecedent to change management (Agote, et al., 2016). To understand this more, trust was understood by considering the factors of trustwortiness, namely, ability, benevolence and integrity (Mayer, et al., 1995). These three subconstructs were understood in the context of RPA to identify what characteristics are required in a leader to enable employees to trust them. The overriding question is still whether trust in leadership impacts the implementation of RPA.

CHAPTER 3 RESEARCH QUESTION

The purpose of this research was to understand how trust, specifically in transformational leadership, impacted the effective implementation of RPA. The primary research question was supported by the following sub-question which asked if trust in transformational leadership decreased the fear of job losses. Transformational leadership was used for this study since RPA is a transformational change as it can transform operations, thereby creating a competitive advantage, but can also adversely impact jobs (Lacity & Wilcocks, 2018) Transformation leadership is needed to assist with change management to enable the adoption of RPA even though there is fear (Agote, Aramburu, & Lines, 2016).

To address the research question, three core constructs were studied namely: (1) RPA implementation, (2) affective commitment (an emotional attachment to change) and (3) trust in transformational leadership. Each of these constructs were studied to address the research questions.

Within the construct for the implementation of RPA, the impact of RPA was considered based on whether it makes the employee's role easier and whether the implemented solution (the bot) performs well. For the purpose of this study, effective implementation was defined as the ability of RPA to automate processes and provide benefits to employees coupled with a review of how the implemented bot operated (Wilcocks, et al., 2019). To understand these constructs, the literature in Chapter 2 Literature Review considered RPA together with its benefits and its risks. This was supported by studies on RPA by (Arntz, et al., 2017; Asatiani & Penttinen, 2016; Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; Harrast, 2020; Hoffmann, et al., 2019; Lacity & Wilcocks, 2018; Lacity& Wilcocks, 2015; LeClair; 2019; Madakam, et al., 2019; Osman, 2019; Santos, et al., 2019; Syed, et al., 2020; Wilcocks, et. al 2019). Included in this literature was the argument of how automation increased the risk of job losses and the options to mitigate this risk.

RPA represents an organisational change that would require change management to be effectively implemented (Agote, et al., 2016). The discussion on change management considered the 1947 work of Lewin (Lewin, 1997) and Kotter (1996). Specific focus was placed on affective commitment, which is defined as an emotional attachment to the change, since this was shown to be related to trust (Hechanova, Caringal-Go, & Magsaysay, 2018; Xiong, Lin, Li, & Wang, 2016). Affective commitment was considered to be an important construct necessary in understanding the impact of trust in leadership on the implementation of RPA. Further change management academic studies included as part of the study were

(Bass, 1995, Hechanova, et al., 2018; Khan & Smuts, 2017; Luo & Jiang, 2014; Men, Yue, & Liub, 2020; Piderit, 2000; Xiong, et al., 2016; Yue, Men, & Ferguson, 2019).

The key element of change management considered was that of trust in leadership. The key academic literature in this study was the integrative trust model developed by Mayer, et al., (1995) and built on by (Addison & Teixeira, 2020; Baer, et al., 2018; Breevaart & Zacher, 2019; Costa, et al., 2017; Dirks & Ferrin, 2002; Gupta, et al., 2016; Harms, et al., 2016; Kujala, et al., 2016; Lippert & Davis, 2006; Mayer & Gavin, 2005; Neves, et al, 2018; Poppo, et al., 2016; Rousseau, et al., 1998; Schoorman, et al., 2007). The definition of trust adopted by Rousseau, et al., (1998) formed the basis of this study where trust was defined as a "*psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another"* (Rousseau, et al., 1998:395). This was studied in the context of the research question and linked to the factors of trustworthiness (ability, benevolence and integrity) that was highlighted in the integrative trust model.

3.1 Trust in transformational leadership and its impact of implementation of RPA

As highlighted in Chapter 2, the role of trust in leadership was used since RPA is expected to lead to transformational change which would require transformational leaders. The study assumed that organisations that are deploying RPA have transformational leaders, however the data collected included specific reference to trust in leadership which supports transformational change. For the purpose of this study, trust in leadership and trust in transformational leadership were used interchangeably.

The independent variable in this study was trust in leadership which was evident by an employee's intention to accept the fear of possible displacement as a result of RPA based on the "*intentions or behaviour"* of the leader (Rousseau, et al., 1998:395). This variable is defined in terms of the Mayer, Davis & Schoorman model which expanded on the definition of trust to include the subconstructs of ability, benevolence and integrity (Mayer, et al., 1995). This variable was measured through feedback from employees who are employed by companies that employ RPA as part of their strategy as outlined in Chapter 4. This study did not consider the dyadic nature of trust but considered trust from the perspective of the employee (Gooty & Yammarino, 2011). This was appropriate for this study since the employee could be adversely impacted by automation. Therefore, the effective implementation of RPA was considered based on whether the employee trusted their leader as it related to this change.

The dependant variable was defined as the implementation of RPA evident by the adoption of RPA, together with obtaining the benefits from implementation. This was further unpacked by understanding these benefits as outlined in the literature review. These benefits included the replacement of routine and repetitive tasks, thereby allowing employees to focus on other tasks (Harrast, 2020). RPA adoption could also improve the productivity of employees thereby leading to increased shareholder benefits (Lacity & Wilcocks, 2016). This arises because RPA is expected to make employees' jobs easier.

The primary research was designed to understand the relationship between the two to identify whether trust in leadership impacted RPA adoption. In doing so, the research correlated trust and the implementation of RPA to understand if there was a relationship.

3.2 Trust in transformational leadership and its impact on the fear of job losses

Having understood the meaning of trust, humans still have to decide whether to adopt RPA (with its benefits) or be fearful of RPA because it could in fact replace them. The sub question of the research paper quantified the effect of trust as it related to fear of job losses. This question was directly related to the primary research question since it provided further evidence of trust in leadership. For example, if employees trust leaders and this leads to a decrease in the fear of job losses, it is more likely that trust in leadership impacts the effective implementation of RPA.

The theory indicated that job losses could be circumvented if leaders implement change plans to create a shared vison with employees (Kotter, 1996). This could be the result of the implementation of programmes to upskill employees for new roles from automation or for changes to their current role (Arntz, et al., 2017). The implementation of these programmes in themselves can enhance trust as it indicates that the needs of employees are placed before their own (Mayer, et al., 1995). The study considered this research question by analysing the relationship between trust and the fear of job losses.

CHAPTER 4 METHODOLOGY

4.1 Introduction

The purpose of this research was to understand how trust, specifically in leadership, impacts the effective implementation of RPA. Trust is a widely researched construct (Schoorman, Mayer, & Davis, 2007). However, RPA is relatively new and studies on the impact of trust on its implementation are rare (Wilcocks, Lacity & Hindle, 2019). Therefore, the model used in other studies on trust was applied to test trust in the context of implementation of RPA. This chapter outlines the method applied to test the research question highlighted in Chapter 3 Research Question.

4.2 Research design

A post-positivist view was selected as the worldview underpinning this study where human expression and behaviour determine the cause and effect relationship (Harkiolakis, 2018). Post-positivism is a research philosophy, sometimes referred to as the scientific method, that is based on the premise that *"causes (probably) determine effects or outcomes"* (Creswell & Creswell, 2018: 6). The relationship between trust and effective implementation could be analysed to determine its effect and impact. The post-positivism worldview was appropriate for this study since it is reliant on theories of trust in leadership and change management that have already been established (Sousa, 2010). This reliance on existing theories resulted in the study overlooking alternative theories synonymous with postmodernism and critical realism (Sousa, 2010). In terms of this worldview, trust exists, and this can be considered to provide evidence of its relationship with the implementation of RPA (Harkiolakis, 2018). In this way, trust and effective implementation of RPA is viewed as observable and measurable (Sousa, 2010). However, this would make It difficult to discover new phenomenon around trust due to the reliance on existing studies, discussed in Chapter 2 Literature Review (Harkiolakis, 2018).

At the time of the research study being conducted, the researcher was employed in an organisation that was implementing RPA as part of its strategy. This background provided a practical understanding of RPA, its benefits and how it impacted employees from a change management perspective. In addition, this influenced the selection of a post positivist worldview which was aligned to the researcher's analytical mind since the scientific method is linked to structure and systemic observation (Gravetter & Forzano, 2017). While the researcher's bias and beliefs could have influenced the study, the structure and science behind this philosophical view ensured that the researcher's personal feelings did not impact the observations (Gravetter & Forzano, 2017). Furthermore, validity and reliability testing

helped ensure that the study was free from bias and represented the population it intended to represent.

A deductive approach was used for this research and allowed for the prediction of *"a small set of specific examples from a general statement about the complete set of all possible examples"* (Gravetter & Forzano, 2017:13). In this case, the prediction was that trust impacted the effective implementation of RPA, therefore, if there was trust there would be effective implementation. In addition, the prediction was that trust resulted in a decreased fear of job losses. Therefore, if there was trust, there was likely to be less fear of job losses.

The positivist philosophy decreased the size of ideas into variables (trust in leadership, the implementation of RPA and the fear of job losses) to test the relationship between variables (Creswell & Creswell, 2018). Trust was determined to be the independent variable while the effective implementation of RPA was the dependent variable as discussed in Chapter 3 Research Question. These variables were assigned values based on the participant responses to the survey, which were then summarised, analysed and interpreted to address the research question (Gravetter & Forzano, 2017). This provided proof of the existence of relationships between trust and the implementation of RPA, plus trust and the fear of job losses (Harkiolakis, 2018).

For the purpose of this study, three constructs were studied, (1) trust in leadership, (2) affective commitment and (3) the effective implementation of RPA. Firstly, trust in leadership was the primary construct which was defined as the employees' intention to accept vulnerability given the actions of their line manager (Rousseau, Sitkin, Burt, & Camerer, 1998). This construct was studied in line with the Mayer, Schoorman & Davis (1995) integrative model of trust which considered factors of trustworthiness (ability, benevolence and integrity) as key indicators of trust. Secondly, affective commitment as related to trust, represented an employee's emotional attachment to the change, such as RPA (Agote, Aramburu, & Lines, 2016; Neves, Almeida, & Velez, 2018; Xiong, Lin, Li, & Wang, 2016). Thirdly, to assess the effect of the implementation of RPA, the construct comprised of the benefit of RPA to employees and the performance of the bot (Lacity & Wilcocks, 2018; Wilcocks, et al., 2019). These constructs were discussed in greater depth in Chapter 3 Research Question.

The use of quantitative methods allowed for testing of constructs such as trust but linked to the implementation of RPA (Harkiolakis, 2018). While the use of quantitative methods does not easily capture contextual details of a situation (specifically the attitudes and beliefs), the

focus was on the relationship between the constructs and how it could be explained rather than the attitudes and beliefs of respondents (Harkiolakis, 2018). The objective theories in this case were based on the theoretical trust framework developed primarily by Mayer, et.al (1995) and built on by various other researchers who studied trust (Addison & Teixeira, 2020; Agote, et al., 2016; Baer, et al, 2018; Breevaart & Zacher, 2019; Costa, et al., 2017; Dirks & Ferrin, 2002; Mayer, et al., 2007; Mayer & Gavin, 2005; Neves, et al., 2018; Xiong, et al., 2016) to name a few. These theories postulated that trust is built over time and is based on the employee's perception of a leader's ability, benevolence and integrity (Mayer, et al., 1995; Mayer, et al., 2007; Mayer & Gavin, 2005). Together these factors would determine if an employee trusts their leaders. Since the study was linked to organisational change, the role of the leader in driving the adoption of RPA was also a key consideration (Kotter, 1996; Lewin,1997).

This study applied a comparative or correlation study design and focused on examining the relationship between trust in leadership and implementation of RPA (Creswell & Creswell, 2018; Gravetter & Forzano, 2017, Harkiolakis, 2018). In this instance there was no manipulation of trust and implementation of RPA variables in the study (Harkiolakis, 2018). A correlation study was ideal as trust in leadership and its impact on the implementation of RPA has not been extensively researched as noted in Chapter 1 (Gravetter & Forzano, 2017). However, correlation studies would not indicate whether trust in leadership caused effective implementation of RPA but whether there was a relationship (Gravetter & Forzano, 2017; Harkiolakis, 2018). A causal comparative model was not considered appropriate since it is usually used when there are two control groups, which was not the case in this study (Harkiolakis, 2018). As a result, the comparative or correlation study design was considered appropriate.

For the purpose of this study a structured online survey research design was used and was acceptable since it described and tested associations between trust and effective implementation of RPA while allowing for a view of the *"trends, attitudes and opinions"* of the sample as it related to trust and the effective adoption of RPA (Creswell & Creswell, 2018:147). The survey was designed in line with the research question, the literature review and the quantitative methodology. More on the rationale for the use of this instrument is provided in Chapter 4.6 Measurement instrument, but the design was primarily selected since it represented an appropriate method for recording what existed naturally and is a common instrument for measuring trust (Gravetter & Forzano, 2017).

4.3 Research population

The population is the group of interest for the researcher (Gravetter & Forzano, 2017). The population was further described as a *"set of cases or subjects (such as individuals, groups, institutions, countries etc)"* (Nuemayer & Thomas, 2017:85). For the purpose of this study, the population comprised employees within organisations that implemented RPA as part of their strategy. The population spanned multiple organisations within varying industries both locally and internationally to cater for the increased adoption of RPA noted in recent years (Le Clair, 2020). As such, the exact size of the population could not be determined with accuracy.

To reiterate, for the purpose of this study, the leaders were line management who had the potential to affect operational and tactical decisions, and top management who influence culture (Dirks & Ferrin, 2002; Mayer & Gavin, 2005). Line management was included as part of the population of employees who had been affected or impacted by RPA within their area since line management would be employed by organisations implementing RPA and therefore would also be impacted by RPA.

4.4 Unit of analysis

The unit of analysis refers to what or who should provide the level of data and at what level (Hakiolakis, 2018). In this study, the researcher aimed to understand how trust in leadership impacted the implementation of RPA. Trust in leadership was looked at from the lens of the employee who trusted leadership to implement RPA within the organisation. The population as stated in Chapter 4.3 was therefore all employees within organisations that have implemented RPA as part of their strategy. Thus, the unit of analysis was the employees within these organisations that were impacted by RPA. These employees could be fearful that RPA would displace their jobs which would impact change management and the trust in leadership.

4.5 Sampling strategy

A sample is defined as the segment of a population that participates in the study (Harkiolakis, 2018). Probability sampling and non-probability sampling are the two methods of selecting the participants in a study (Gravetter & Forzano, 2017). With probability sampling each person in the population has an equal chance of being selected (Creswell & Creswell, 2018). This is considered to generate a perfect sample where the sample is representative of the population (Nuemayer & Thomas, 2017).

For the purpose of this research, the probability sampling method could not be applied since the exact size of the population was not known hence the odds of selecting an individual for

the study could not be known (Gravetter & Forzano, 2017). Furthermore, a numbered list of all employees employed in entities implementing RPA (sampling frame) could not be developed (Harkiolakis, 2018). Therefore, non-probability sampling was used but, randomness could not be ensured in this sampling method (Harkiolakis, 2018). While this method does not provide an unbiased method of selection, this method is commonly used in research similar to this, where the exact size of the population is unknown and a full list of all the individuals in the sample cannot be determined (Gravetter & Forzano, 2017). In addition, the sampling strategy was considered appropriate to address the research question since employees working with leaders implementing RPA would be best suited to provide their perception of the adoption process (Bono & McNamara, 2011). As such, non-probability sampling was used in this study.

For the purpose of this research, purposive or convenience sampling (a form of non-probability sampling) was used, where the individuals participating in the study were selected based on specific characteristics – in this case employees of organisations implementing RPA as part of their strategy. The survey was distributed to employees within the researcher's network, in organisations that have implemented RPA, via email through Microsoft Forms. Participants were accessed through the network, through LinkedIn, and leveraging off current relationships where it was known that RPA is being used in an organisation. In addition, the survey included a scoping question to ensure that it was only completed by employees within organisations that have implemented RPA or are implementing RPA as part of their strategy.

The method used to sample was biased since there was little control over the sample and the individuals were probably not representative of the general population (Gravetter & Forzano, 2017). To limit bias, the researcher tried to ensure that the sample was reasonably representative and less biased by distributing the survey to a cross section of employees in organisations that have implementation RPA, however this could not be assured with certainty. A clear description of the sample and the participants was provided in Chapter 5 Findings, to illustrate how the sample represents a cross section of employees, for example, 176 employees were selected from the Financial Services industry (Gravetter & Forzano, 2017). The sample's representativity can then be judged based on the category of the respondent.

The sample size could not be determined as a percentage of the population given that the population size was unknown (Creswell & Creswell, 2018). Therefore, the sample size was determined using G*Power which is a Power Analysis tool used to determine the sample

size where the association between variables is being assessed (Creswell & Creswell, 2018). The use of this tool is however diluted if a snowballing sampling method is used or if there are inconsistent questions or techniques to collect data (Edmondson & McManus, 2007). In this research, the data collection process used consistent questions and techniques for all respondents. Furthermore, snowballing was not used as the sampling method. Since there was no other method to determine the sample, the calculation was still used. Based on this calculation, the sample test was determined to be 100 individuals. To ensure that the minimum target size was met, the researcher was prudent and used a minimum sample size of 400 to increase the likelihood that the sample represented the population. In addition, the researcher intended using Confirmatory Factor Analysis can be conducted (CFA) which requires a minimum sample of 200 respondents (Worthington & Whittaker, 2006). This removed some of the selection bias arising from the use of non-probability sampling.

4.6 Measurement instrument

As mentioned in Chapter 4.2 Research Design, a positivist philosophy and deductive approach was used to understand the relationship between trust in leadership and the adoption of RPA. This was tested using an online survey designed to study a sample of employees in organisations that have implemented or are implementing RPA. This method was appropriate since the theory around trust is well developed with surveys regularly used to test trust (Dirks & Ferrin, 2002; Mayer & Gavin, 2005). The constructs are concrete and externally oriented and response bias was appropriately managed (Rindfleisch, Malter, Ganesan, & Moorman, 2008). In addition, a survey design provided simplicity in execution and the ability to provide a rapid turnaround of data which was then easily analysed (Gravetter & Forzano, 2017).

4.6.1 Survey design

A survey provided a description of the *"trends, attitudes, and opinions of a population, or tests for associations among variables of a population by studying a sample of that population"* (Creswell & Creswell, 2018: 147). For the purpose of this research, questions in the survey were derived from the literature review and guided by the research questions. Two key sub-constructs that helped explain the behavior of trust, namely affective commitment and the conditions for trust (Neves, et al., 2018 & Mayer, et al., 1995) were analysed. These constructs helped explain and predict behavior as they related to trust (Gravetter & Forzano, 2017). An added construct related to RPA and its effective implementation was considered key to the research.

Data was collected to understand the constructs through survey questions where respondents were requested to respond to the questions using a five-point Likert scale of “strongly disagree”, “disagree”, “neither agree or disagree”, “strongly disagree”, “disagree” (Harkiolakis, 2018). A *five-point* Likert scale was considered appropriate since it coefficient alpha reliability has been shown to increase up to the use of five categories in a Likert scale (Hinkin, 1998). Furthermore, a Likert scale was acceptable due to the ease of interpretation and its ability to be adjusted based on the variables (Rindfleisch, et al., 2008). In addition, the survey measured the opinions, beliefs and attitudes such as trust in leadership when implementing RPA, which made it appropriate for this study (DeVelis, 2016). The inclusion of the rating scale simplified the survey since it was easier for participants to understand and answer the questions and provided numerical values to use as measurement scales (Gravetter & Forzano, 2017).

The survey did not include an open-ended exploratory question which was originally intended as part of the research (Gravetter & Forzano, 2017). While this could have limited the respondent flexibility to comment, the researcher decided that the drawbacks to such a question, including that the answers are often difficult to summarise or analyse, and the participant may have been unwilling to share more, which outweighed the need for flexibility. Therefore, the exclusion of this question did not adversely affect the study.

4.6.2 Measures

A sample of the survey questionnaire is provided in Appendix A and was structured as follows:

- The introduction outlined the context of the research and requested that the respondent complete the survey. It provided an overview of the time required to complete the survey and that participation was voluntary and anonymous. In addition, respondents were advised that only aggregated data would be reported hence assuring respondents of their anonymity.
- Part A included eight general questions, including the scoping question on whether the employee is employed in an organisation that deploys RPA. This section included questions on the gender, length of service, age, number of subordinates, job level, education level and industry. Additional information was requested if the industry was not in the predefined list included in the question on the industry.
- Part B1 included four questions which questioned the benefit of RPA for employees (construct of effective implementation of RPA). These questions were not well defined given the dearth of literature around RPA (Syed, et al., 2020). Therefore,

scales were developed to define them (Churchill, 1979). The scales were developed based on Chapter 2 Literature Review.

- Part B2 included nine questions which questioned the employees' affective commitment to RPA (a construct related to trust). These questions were based on change management and the readiness for change
- Part B3 included twelve questions which questioned an employees' trust in leadership (a construct). Similar to the questions in B1, scales were developed to measure these as discussed below.
- Part B4 included five questions which questioned the performance of RPA linked to the construct of effective implementation of RPA.

The survey was specifically designed in these categories since these are linked to the literature review and the constructs that required testing. The design was deceptive in that it alluded to 13 questions when there are actually 38 questions within the survey.

Introduction

The survey was accompanied by an introduction which outlined the purpose of the study and communicated the anonymity and confidentiality of the survey. The purpose of this survey study was to test how trust in leadership impacted the implementation of RPA, with the independent variable being trust in leadership and the dependant variable being the implementation of RPA. Trust in leadership was the independent variable since it influences or affects the implementation of RPA (Creswell & Creswell, 2018). Respondents where also provided contact details of the researcher for further questions on the study, if required.

Part A - Demographic data

Key to this section was the screening question which determined if the respondent was employed by an organisation implementing RPA as part of its strategy. This was a key question since it assisted in identifying participants' organisations that did not apply RPA as part of their strategy. These respondents could not provide insights into the research question, since they have not adopted RPA, and were therefore excluded from scope of the data analysis. Also, included in this section was the demographic data specific to the research topic and question, which helped the researcher describe the participants (Gravetter & Forzano, 2017). A summary of the descriptions of the sample is included in Chapter 5 Findings.

Part B1 –Benefits of RPA to employees

The questions in this section specifically questioned the impact of RPA on the tasks performed by the employee and was linked to the construct relating to the effective implementation of RPA. A total of four questions were included in this section and were derived from the literature review relating to RPA, as it related to the benefits of RPA to employees (Asatiani & Penttinen, 2016, Harrast, 2020; Lacity & Wilcocks, 2016, Lacity & Wilcocks, 2018; Wilcocks, et al., 2019). More detail on the development of these questions is included in Chapter 4.6.2 Development of new measurement scales. The results in Chapter 5 Findings reflected an alpha co-efficient of 0.7 which showed that there was a high level of consistency in these questions.

Part B2 - Employees' affective commitment to RPA

The questions in this section related to the affective commitment of employees to the adoption of RPA. Affective commitment of the employee determined whether an employee was willing to commit to a change (Neves, et al., 2018). This was important since it is positively related to trust (Xiong, et al., 2016). Furthermore, these questions helped understand if employees were afraid that RPA would replace them, which was a secondary research objective of this study. A total of nine questions were included in this section and were derived from the literature review relating to affective commitment and trust and from the literature on the displacement of employment due to automation. These questions were derived from a previous study relating to affective commitment of employees (Agote, et al., 2016; Arntz, Gregory, & Zierahna, 2017; Frey & Osborne, 2017; Neves, et al., 2018). The results in Chapter 5 Findings reflected an alpha co-efficient of 0.742, which showed that there was a high level of consistency in these questions.

Part B3 - Employees' trust in leadership.

The questions in this section sought to understand the trust that employees have in leadership. As highlighted in the literature review, trust is understood to include a willingness to accept risk (Mayer, et al., 1995). In RPA, the risk exists because there is uncertainty as to whether the leader would act in the best interest of the employee by reskilling them or whether the leader would support the loss of jobs and thereby fulfil their fears (Rousseau, et al., 1998). This was central to unpacking the research questions.

A total of twelve questions were included in this section to understand the levels of trust that employees had in leadership that were accountable for the rolling out of RPA and linked back to the construct of trust. These questions were adapted from previous studies relating to trust (Mayer, et al., 2007; Mayer and Gavin, 2005). Key questions related to the factors of trustworthiness namely ability, benevolence and integrity (Mayer, et al., 1995). The results in

Chapter 5 Findings reflected an alpha co-efficient of 0.894 which showed that there was a high level of consistency in these questions.

Part B4 – Effective adoption of RPA.

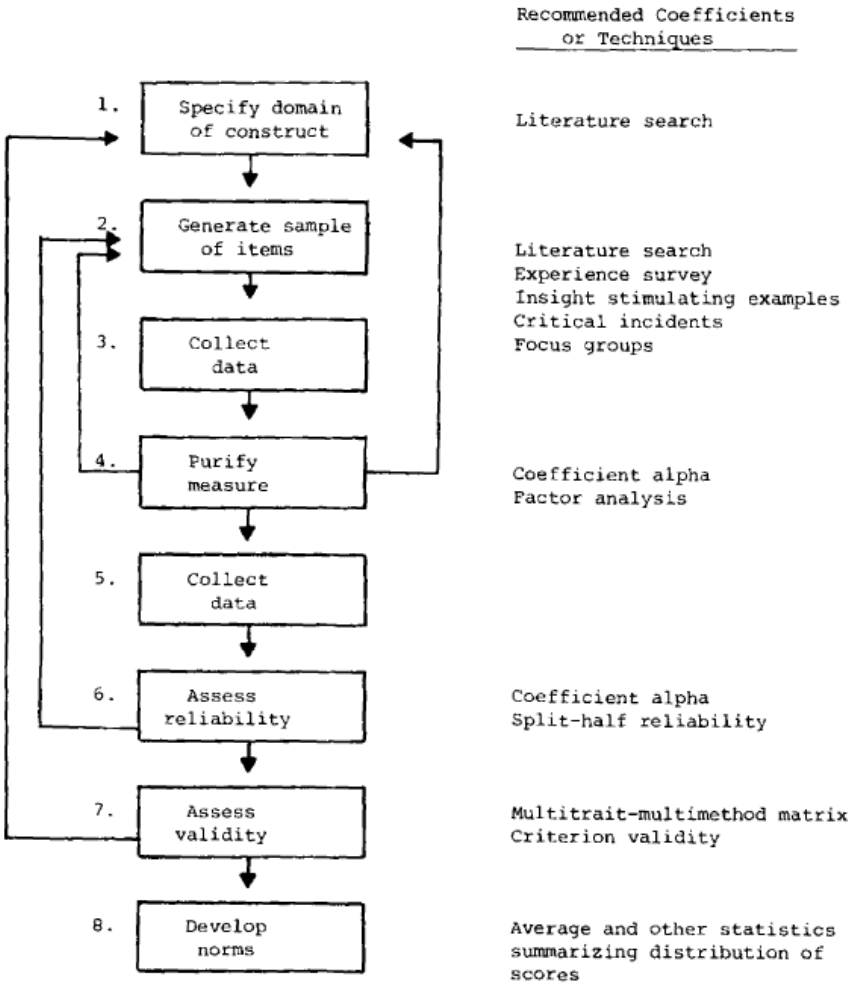
The questions in this section questioned the effective implementation of RPA by requesting feedback on the performance of the RPA solution and how management helped remove obstacles relating to RPA. A total of five questions were included in this section and were derived from the literature review relating to RPA which outlined the benefits of RPA and how a bot would be considered effective (Asatiani & Penttinen, 2016, Lacity & Wilcocks, 2016, Lacity & Wilcocks, 2018). More detail on the development of these questions is included in Chapter 4.6.2 Development of new measurement scales. This supported the construct relating to effective adoption of RPA. The results in Chapter 5 Findings reflected an alpha co-efficient of 0.811 which showed that there was a high level of consistency in these questions.

4.6.3 Development of new measurement scales

Part B1 and part B4 both related to the construct of effective implementation of RPA which was key to the research question which looked at how trust in leadership impacted the effective implementation of RPA. Trust in leadership is a widely researched construct and therefore there is sufficient information to determine scales to measure (Mayer, et al., 2007). However, the dearth of academic literature on effective implementation of RPA and RPA in general, required the adaptation of measurement scales that already existed in literature to ensure that the measures on the survey represented the construct of effective adoption of RPA (Hinkin, 1998; Hoffmann, Samp, & Urbach, 2019; Lacity & Wilcocks, 2016; Wilcocks, et al., 2019; Syed, et al., 2020).

The development of these scales ensured the reliability and validity of the data, given the inherent errors that exist when measuring variables (Churchill, 1979; DeVelis, 2016). Had this not been completed, the correlations between trust and effective implementation of RPA could have been underestimated which would have impacted the findings in this study (DeVelis, 2016). To develop measurement scales, the technique developed by Churchill (1979) outlining the steps involved in developing scales, was used.

This is depicted below but explained in more detail in the section that follows.



(Churchill, 1979:66)

Figure 3 – Development of scales

Specify the domain construct

The starting point for the development of scales was the definition of RPA based on current theory and research where it is clear what is excluded and included within RPA (Churchill, 1979; Worthington & Whittaker, 2006). In this case RPA was defined as tools used to automate tasks that "*use rules to process structured data, resulting in a single correct answer – in other words, a deterministic outcome"* (Lacity & Willcox, 2016:43). The theory in this instance was obtained from recent works of various researchers (Arntz, et al., 2017; Asatiani & Penttinen, 2016; Brynjolfsson & McAfee, 2016; Frey & Osborne, 2017; Hoffmann, et al., 2019; Lacity & Wilcocks, 2018; Lacity & Wilcocks, 2015; Lacity & Wilcocks, 2016; Lacity & Wilcocks, 2018; LeClair, 2019; Madakam, et al., 2019; Osman, 2019; Santos, et al., 2019; Syed, et al., 2019; Wilcocks, et. al 2019). More detail on RPA is included in Chapter 2.1 RPA.

Care was taken in the definition of the construct (refer to Chapter 3 Research question) so that the items could be clearly related to RPA and the effective adoption of RPA (Worthington & Whittaker, 2006). Scales were developed to measure the construct of adoption of RPA that is believed to exist based on the theory that the attributes of the RPA were measured and not the RPA itself (DeVelis, 2016).

Generate sample of items

The next step involved generating items which captured the definition of RPA, together with the inclusions and exclusions (Churchill, 1979). A deductive approach was used for the generation of scales, where items were captured from literature which contained similar definitions of the construct, and were included in industry journals which highlighted that RPA replaced routine or repetitive tasks thus allowing staff to focus on more challenging tasks (Wilcocks, et al., 2019). This improved productivity and made the job of employees easier (Lacity & Willcox, 2016). However, this could lead to concerns about job losses (Arntz, et al., 2017; Frey & Osborne, 2017; LeClair, 2019). Therefore, the sample of items included the positive and negative aspects of RPA. The use of this method to generate the items for inclusion in the survey supported the content validity for the study (Hinkin, 1998).

The definition of the construct applicable to Part B4, delved into the performance of the bot including whether the bot performed as expected, whether it broke down, and whether it was continuously enhanced. This was linked to the employee experience of implementation, with poor experiences increasing attrition, decreasing creativity and institutional knowledge of employees (Gownder, 2020). Bots that break down for more than a day increased the maintenance costs and this breakdown was generally caused by the task being too difficult for the bot (LeClair, 2020). Together these questions helped unpack the value of RPA for the employee. The questions developed addressed the critical elements of RPA and the review of the literature allowed for refinement of the questions (Churchill, 1979). Refinement of the questions was completed following the pilot study,

The number of items included in the original sample was vast to encapsulate multiple items that impacted the construct (DeVelis, 2016). These were then decreased to be more specific to the construct relating to effective adoption of RPA with a summary of the final questions included below:

<u>Part B 1</u>

B1.1 RPA has replaced my routine or repetitive tasks

B1.2 RPA has increased the time I have to focus on other tasks
B1.3 RPA has improved my productivity
B1.4 RPA has made my job easier

Part B 4
B4.1 My bot performs as it is expected to
B4.2 My bot has frequent breakdowns
B4.3 My bot is continuously enhanced
B4.4 My bot makes my job easier
B4. 5 My leader helps remove obstacles related to my bot

The questions were expected to share a common cause in that they represented the impact RPA had had on the organisation (specifically those related to employees) and the effective functioning of the bots in production (DeVelis, 2016). These questions were derived by stratifying a large number of questions with a constant review of the theory and definitions of RPA to ensure that rigour was applied in determination of the scales (Churchill, 1979).

To make the survey easier and quicker to complete, the number of scales applied was limited (Hinkin, 1998; Worthington & Whittaker, 2006). The scales were only applied to understand the impact of RPA on the employee and the effectiveness of the bot. The number of questions within these scales ranged from four to five and used a five-point Likert-type scale which also made the survey simpler and quicker to complete (Hinkin, 1998). Also assisting with completion was the way in which the questions were written which was "*clear, concise, readable, distinct, and reflecting the scale's purpose"* which allowed for meaningful scoring relating to the construct (Worthington & Whittaker, 2006:813).

Collect data
Data was collected from a sample of 400 individuals (refer to Chapter 4.5 Sampling strategy). While there was no recommended sample size to allow for the calculation of validity and increase in the number of respondents would increase the possibility that the sample represented the sample. It would also allowed for the use of CFA where a minimum required sample of 200 was required (Worthington & Whittaker, 2006), as explained in Chapter 4.5 Sampling strategy.

Purify measure
Following the collection of data, the data related to Part B1 and Part B4 was purified by assuming that all these items within this construct were intercorrelated (Churchill, 1979).

This was tested by computing the coefficient alpha to determine the quality of the measure - with a low measure indicating that the questions did not support the overall construct (Churchill, 1979). These items were further examined by plotting them in a matrix of scores, and correlations close to zero were eliminated, if warranted (Churchill, 1979).

The scales were reviewed by employees exposed to RPA and who were displaced by RPA by using a pilot survey (refer to Chapter 4.6.3 Pilot survey). This helped assess item quality and helped enhance the quality of the items (Worthington & Whittaker, 2006). This approach was used in prior research to improve the rigour of the scale development (Wright, Quick, Hannah, & Hargrove, 2017).

Assess reliability

During this step, the internal consistency reliability of each scale was calculated, by using coefficient alpha (Hinkin, 1998). This helped identify whether the item performed in a predictable and consistent way (DeVelis, 2016). Items with a large coefficient alpha provided a strong item covariance and suggested that the sampling domain was captured adequately (Churchill, 1979). An absolute minimum coefficient alpha of 0.70 was used as a benchmark for these newly developed measures such as those relating to RPA (Hinkin, 1998). Items that decreased the reliability adversely, were discarded and not considered for further analysis.

Assess validity

Validity on the measures was assessed by correlating these to other measures to assess if these converged and behaved as expected (Churchill, 1979). However, it is noted that it is not possible to show that a scale is "valid", but this could be used to augment validity (Wright, et al., 2017). Showing that the measure behaved as expected was difficult since the observable data related to the same construct (RPA and RPA performance) and may not have indicated that this related to the constructs that motivated the research in the first place (Churchill, 1979). Therefore, the behaviour of the measure in relation to other measures was assessed by looking at the behaviour for specific groups as expected, or whether the scale predicted some criterion (Churchill, 1979). This was completed by using correlation analyses which showed how the measures related to similar constructs and the relationship to constructs from which it should have differed (Hinkin, 1998; Wright, et al., 2017).

Develop norms

"Developing norms" is the technical term that compares the scores obtained for one person against other people (Churchill, 1979). The quality of these norms is dependent on the

number of cases on which the average is based together with their representativeness (Churchill, 1979). This was assessed by applying descriptive statistics on these which included averages and distribution testing.

4.6.4 Pilot survey

Prior to distribution of the survey to the sample, a pilot study was performed to test the questionnaire. This pilot enhanced the effectiveness of the survey by addressing limitations while also adding to validity of the overall study (Harkiolakis, 2018). As part of this test, 13 employees within the researcher's network were asked to participate in the pilot to ensure the effectiveness of the survey. This group included employees who were directly displaced by RPA and those who were involved in RPA as part of their daily jobs. Feedback was mandatory and participants were required to assess: the understandability of the questions in the survey, the length of time to complete the survey, the ease of the design, clarity of the instructions for completion and the appropriateness of the questions given the research question (Creswell & Creswell, 2018).

All 13 employees included in the pilot commented on the survey, and all reported a high level of understanding of the questions and asserted that these were clear. The survey was assessed as easy to complete and did not take a long time to complete. Feedback from the pilot indicated that some questions had grammatical errors, which were corrected.

Focus was placed on identifying the comments related to questions on RPA, specifically Part B1 and Part B4, since these were newly created scales with limited prior research. From the feedback, no concerns on these questions were raised and the questions were assessed as being understandable and clear. No recommendations were received to include additional questions which would further support the study, therefore, there were no additional questions added.

Recommendations were made on improvements to the Microsoft Forms such that it flowed better and made the survey easier to complete. For example, in the pilot, none of the questions were mandatory which would have increased the risk of missing items and impaired validity. Feedback from a participant in the pilot study recommended that questions be changed to being mandatory. This was done which eliminated the risk of missing data since all questions had to be completed before the survey could be submitted by the respondent.

All of these recommendations were affected prior to distribution of the survey to the broader sample. Following the changes affected after the pilot study, no further changes were made to the questions included in the survey. The results of the pilot study were not included as part of the data analysed since this was used for the purpose of improving the questions. The pilot study contributed to the validity tests as highlighted in Chapter 4.8.1 Validity of measurement.

4.7 Data gathering process

Once the pilot study was completed and the survey was refined, data collection commenced by requesting the sample to join the research (Harkiolakis, 2018). The survey was administered using Microsoft Forms and participants were able to access it via a link, included in an email or on LinkedIn. The survey was emailed to participants by leveraging off personal networks and posting on LinkedIn (Gravetter & Forzano, 2017). Other social medial platforms, such as Facebook, were not used which added control over the sample (Gravetter & Forzano, 2017). This method of collection was economical and efficient in reaching a wide number of individuals (Gravetter & Forzano, 2017). However, people might have forwarded/shared it with their own networks and this could have impacted the overall reliability of the study.

The survey was distributed to respondents in the sample and remained open for two weeks. After the first week, a reminder was sent to encourage completion of the survey. The reminder reiterated that participation was voluntary, and that confidentiality and anonymity would be preserved. The survey was closed after two weeks at which time an appropriate number of responses were received to commence data analysis. No further reminders were sent following this since the minimum number of responses had been achieved.

4.8 Analysis approach

Once the survey was closed, the data collected through Microsoft Forms was analysed using descriptive and inferential statistical analysis (Creswell & Creswell, 2018). The use of statistics helped organise and summarise the data to allow the researcher to understand what had happened in the study. In addition, statistics helped the researcher answer the initial questions posed by the research question (Gravetter & Forzano, 2017). The statistical analysis was completed using IBM® SPSS version 25 (hereafter referred to as SPSS).

The use of Microsoft Forms enabled the collection of all data in Microsoft Excel. However, prior to using the data, it was sorted to preserve the scope by excluding “no” responses to the screening question which asked whether the employee was employed by an

organisation that had implemented RPA as part of its strategy. Anyone who responded “no” to the screening question, was not included in the data analysis and was segmented from all the data that was relevant to the research question. Information about the number of respondents and non-respondents is presented in Chapter 5 Findings (Creswell & Creswell, 2018).

The data was coded prior to inputting it into SPSS. The coding language assigned a number to each of the selections on the Likert scale as follows: (1) Category for strongly disagree was assigned a number of -2, (2) Category for disagree was assigned a number of -1, (3) Category for neither agree nor disagree was assigned a number of 0, (4) Category for strongly agree was assigned a number of 2, (2) Category for agree was assigned a number of 1. This method of coding would result in low means but was considered easier to use. Furthermore, the coding was reversed for negative questions.

Response bias was analysed to identify if non-respondents did respond, whether it would change the overall results of the data collected (Creswell & Creswell, 2018). This was tested by using wave analysis to test selected items. This entailed reviewing a selection of responses in week 1 and week 2 separately to identify whether there were changes in average responses. Changes to average responses would have indicated that there was a higher potential for bias (Creswell & Creswell, 2018). These changes were evaluated through comparison of the descriptive statistics collected in each week of the survey’s duration.

There was a risk of non-response bias which is inherent in all research due to non-responses to the entire survey, but which could have introduced bias into the study (Harkiolakis, 2018). This risk was mitigated by including a cover letter introducing the survey and requesting participation. In addition, the researcher sent a reminder to participants to complete the survey after it had been open for a week (Gravetter & Forzano, 2017). The researcher did not offer any gifts or similar incentives to improve response rates since this was not considered ethical and could have influenced the willingness of the sample to participate in the study (Gravetter & Forzano, 2017). This could have resulted in a coerced response to the survey.

4.8.1 Validity of measurement

Validity was tested by evaluating whether the measurement procedure measured what it purported to measure – in this case trust in leadership impacting effective implementation of RPA (Gravetter & Forzano, 2017). External validity was assessed to determine if the sample

was reflective of the population that it aimed to represent and represented the findings from previous research (Gravetter & Forzano, 2017). Various tests were conducted to confirm validity of the research, as included in Chapter 5.3 Assumption tests.

Validity over the use of survey

Validity could be impaired by the use of a cross sectional survey, such as the one used in this study, since it has been criticised as being prone to common method variance bias and incapable of measuring causal insights (Bono & McNamara, 2011; Rindfleisch, et al., 2008). In this study, this risk was mitigated since data was gathered from multiple respondents (Rindfleisch, et al., 2008). In addition, to validate the cross-sectional approach, correlation tests were completed to determine the strength of the relationships among constructs of interest (e.g., trait correlations, $\rho > .50$) (Rindfleisch, et al., 2008). Furthermore, since the study did not aim to provide evidence of a causal relationship, the use of a cross sectional study was acceptable (Bono & McNamara, 2011).

The pilot study contributed to the criterion-based validity of the study since it identified the presence or absence of the criteria that the study tested (Harkiolakis, 2018). Following the pilot test on 13 individuals, the questions were considered to be appropriate for the study with no further changes to the design of the questions or the actual nature of the questions.

Assumption testing over the population and sample

To address sampling error where the sample fails to accurately represent the population, sampling boundary tests were conducted on the population, which pushed the population boundary in various directions to identify if the results held true for the entire population. One example of this is that there are outliers in trust in leadership (Nuemayer & Thomas, 2017). This helped support the validity of the population. The outliers were identified by analysing the data for each scale using box plots in SPSS which allowed for easy comparison and analysis. The outliers were selected by first completing the Mahalanobis statistic for each construct within the study. Cases with a standard deviation exceeding 2 were identified as outliers (Nuemayer & Thomas, 2017). Descriptive statistics was then computed to understand the outliers within the study. These were removed from the cases being studied, as they were assessed as skewing the data unfavourably (Nuemayer & Thomas, 2017). However, caution was taken on the number of items removed so that the sample was still representative of the population. The results of the assumptions tested are included in Chapter 5.3 Assumption Testing.

Concurrent and construct validity

Consistency of the relationship was established from past use of the instrument (Creswell & Creswell, 2018). The correlation between the measures provided evidence of this. To establish validity, the instrument used to test trust in leadership has been used in other studies (Mayer, et al., 2007; Mayer & Gavin, 2005). The use of previous literature contributed to construct validity since each of the questions asked was grounded in research that raised the importance of trust (Gravetter & Forzano, 2017). This was not the case for questions relating to RPA, and validity in this case was established by applying a recognised technique to develop scales as included in Chapter 4.6.3 Development of new measurement scales.

Factor analysis was used *"to identify or confirm a smaller number of factors or latent constructs from a large number of observed variables (or items)"* (Worthington & Whittaker, 2006:807). This was especially useful with newly developed tests or scales, such as in the case of RPA. Here the validity was tested through the use of Exploratory Factors Analysis (EFA) which determined the significant variables necessary for the analysis (Harkiolakis, 2018). The researcher originally intended using CFA analysis which was possible since the sample size obtained exceeded 200 people (Worthington & Whittaker, 2006). However, the researcher decided to use EFA instead since the test data of 224 respondents was very close to 200. This is unlikely to have adversely impacted the results obtained since the results of both processes are similar (Beavers, Lounsbury, Richards, Huck, & Skolits, 2013). This is particularly true in this case since the measures for trust, affective commitment and the effective implementation of RPA were found to be reliable in Chapter 5.4. In addition, both EFA and CFA function in a similar manner and therefore produce results that are comparable, which further supported the use of EFA (Beavers, et al., 2013).

4.8.2 Reliability of measurement

Cronbach's alpha was used to determine the reliability, where a Cronbach's alpha value was computed and the range was assessed in terms of the guidelines with optimal values ranging between 0.7 and 0.9 (Creswell & Creswell, 2018). A higher value indicated a higher degree of internal consistency and reliability. This method was appropriate since a Likert scale was used. This was computed as follows:

$$r_{11} = \left[\frac{k}{(k-1)}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right]$$

Figure 4 - Formula for Cronbach Alpha

The reliability test also identified questions that adversely impacted the reliability of the study, as described in Chapter 5.4 Reliability. These questions were removed from the study to ensure that the study was reliable. In addition, reliability was assured by documenting the research design in detail to provide a full audit trail of the methodology applied. This is contained in Chapter 4 Research Methodology and supported by the findings in Chapter 5 Findings.

4.8.3 Descriptive and Inferential statistics

Descriptive statistics

Descriptive statistics was provided using SPSS, which organised and summarised the scores from the survey (Gravetter & Forzano, 2017). This type of statistic helped describe the data, and organised the data into tables and graphs that depicted the entire set of data (Gravetter & Forzano, 2017).

Summary values were calculated for each construct and each descriptive question to identify the value that was most representative of the entire group (Gravetter & Forzano, 2017). Summary values such as the means, standard deviations, and range of scores for dependent (implementation of RPA) and independent (trust in leadership) variables was provided to describe the sample's characteristics (Harkiolakis, 2018). The information is presented in a tabular form in Chapter 5 Findings.

Correlation tests

In this correlation study, there was no attempt to manipulate or control trust in leadership and adoption of RPA and these are simply recorded as they existed (Gravetter & Forzano, 2017). The purpose of the correlation tests was to enable the analysis of data relating to the research question of how trust in leadership impacts the implementation of RPA and did trust in leadership decrease the fear of job losses.

The most common types of testing in these studies are regression and correlation (Gravetter & Forzano, 2017), but no regression was applied in this study. In this study various correlation tests were performed, as highlighted below:

- Affective commitment as evidenced by Part B2 was correlated to data collected for trust in leadership as evidenced in Part B3.
- RPA benefits for employees as evidenced in Part B1 was correlated to data collected for trust in leadership as evidenced in Part B3.

- RPA benefits for employees plus the effective implementation of RPA as evidenced in Part B1 and Part B4 was correlated to data collected for trust in leadership as evidenced in Part B3.
- Questions relating to fear of job losses relating to the implementation of RPA evidenced in Part B2 was correlated to data collected for trust in leadership (excluding questions in relation to job losses) as evidenced in Part B3. The applicable question included was *I am afraid that RPA will replace me.*

Correlation measured the direction of the relationship to identify if trust and RPA adoption moved in the same direction, therefore this addressed the primary research question on the relationship between trust and effective adoption of RPA and the question on the impact of trust on the fear of job losses (Gravetter & Forzano, 2017). However, correlation did not provide evidence that there was causation. The summary of the results of the correlation tests is presented in Chapter 5 Findings.

Secondly, Pearson's correlation *"measured the degree and the direction of the linear relationship between two variables"* (Gravetter & Wallnau, 2013:514). A conceptual depiction of how this worked is included by the formula below.

$$r = \frac{SP}{\sqrt{SS_X SS_Y}}$$

Figure 5 - Formula for Pearson's Correlation

This measured the degree to which RPA adoption (X) and trust in leadership (Y) varied together in relation to how these varied apart (Gravetter & Wallnau, 2013). This helped understand whether trust could predict successful implementation of RPA, since Pearson's assists with prediction if two variables are not related in a systemic way (Gravetter & Wallnau, 2013). In addition, the use of Pearson's further supported validity and reliability.

Thirdly, the strength the correlation or relationship was evidenced by a number, with one indicating a strong strength (Gravetter & Forzano, 2017). A perfect correlation was evident where trust and RPA adoption reflected a correlation of 1.00 which indicated that both variables moved in the same way even though the relationship may not have been the same (Gravetter & Wallnau, 2013).

Inferential statistics

Following the use of descriptive statistics, inferential statistics was computed to draw inferences from the sample of the population (Creswell & Creswell, 2018). This allowed the researcher to make generalisations from a population based on a sample (Gravetter & Forzano, 2017).

Inferential statistics was used when determining the alpha level or level of significance, which tests if the results were obtained by chance (Gravetter & Forzano, 2017). The assumptions used for Cronbach alpha included in SPSS are that (1) there is no correlation between the error terms and (2) the items are tau-equivalent (javaTpoint, 2018). Cronbach alpha testing helped assess reliability of the data and was linked to the question on the impact of trust on the adoption of RPA and the impact of trust on the fear of job losses. Results of the testing are included in Chapter 5 Findings.

A t-test was used for the purpose of this study to test a research question about an unknown population mean, when the value of the standard deviation is unknown (Gravetter & Wallnau, 2013). T-tests were used to compare scores relating to the effective implementation of RPA for those individuals with high trust versus those with lower levels of trust as indicated by their scores, as it related to effective implementation of RPA and the fear of job losses. High levels of trust were defined as those scores that exceeded the mean for the construct of trust, whereas low trust scores were those below the mean for trust. Once the trust scores were split, the related scores for (1) effective implementation of RPA and (2) the fear of job losses were assigned and compared to understand if there was a statistically significant effect. The results of this test are included in Chapter 5.8 Inferential statistics.

The assumptions were that (1) the data was continuous, (2) the data was randomly selected and (3) the data had a normal distribution. The dependant variable was RPA implementation which is the sum of RPA and RPA performance scores. The independent variable was trust in leadership. The t-test was linked to the question on the impact of trust on the implementation of RPA and the impact of trust on the fear of job losses. An alternative to correlation was a chi-squared test of independence where the frequency of distribution is shown in a matrix, however this is only applicable for non-numerical data and was therefore not applicable in this study (Gravetter & Forzano, 2017).

The formula for a t-test is below.

$$t = \frac{M - \mu}{s_M}$$

Figure 6 - Formula for t-test

Results of the testing are included in Chapter 5 Findings.

4.9 Limitations of the research design and methods.

The use of the Mayer model introduced a limitation since there have been difficulties experienced with reliability (Mayer & Gavin, 2005). This limitation was mitigated using validity and reliability tests outlined in Chapter 4.8.1 Validity of measurement and Chapter 4.8.2 Reliability of measurement.

The sample selection for this study introduced bias since it uses non-probability sampling to select the participants of the study (Hakiolakis, 2018). Such sampling strategy is commonly used in social sciences but was further mitigated by applying additional robustness tests which were conducted to assess validity of the population as described in Chapter 4.8.1 Validity of measurement. Further, detailed descriptive statistics helped understand the sample better.

The unit of analysis that was sampled was employees who work in organisations that have implemented RPA or are implementing RPA. Since trust in leadership was studied there is a dyadic relationship at play (leader and employee), and it was recommended that the dyad should be tested when assessing trust (Gooty & Yammarino, 2011). However, this study focused on the individual, which is consistent with other studies involving dyadic relationships (Gooty & Yammarino, 2011). This is a potential opportunity for further research.

The research was conducted over a timeframe and additional insights or literature could have become available had this period been extended or if more than one time period was used. For example, trust was considered to change over time with longer relationships, changing the trust relationships between the employee and the leader (Schalke and Huang, 2018; van der Werff & Buckley, 2014). The focus of this study did not include the impact of time on trust relationship but this could be a topic for future research.

CHAPTER 5 FINDINGS

5.1 Introduction

In this chapter, the findings to address the research questions have been presented based on the data analysed. The chapter commences with an overview of the sample followed by reliability and assumptions testing. The chapter then includes a description of the sample and analysis on the research questions to (1) explore the impact of trust on effective implementation of RPA and (2) to explore the impact of trust on the fear of job losses. The data analysed will be interpreted in Chapter 6 Discussion of Results.

The survey questions are linked to the constructs outlined in Chapter 3 Research Question (namely, affective commitment, trust and effective implementation of RPA). The effective implementation of RPA is comprised of RPA and RPA performance as shown below. This chapter uses the abbreviation of AC for affective commitment and RP for RP performance. Each of the survey questions were also assigned abbreviations which are contained in Appendix B. The survey questions completed by respondents can be linked to the constructs as follows:

Affective commitment

- I am proud that my organisation is adopting RPA
- I believe in the value of implementing RPA
- I think that management is making a mistake by introducing RPA
- I would present my objections regarding RPA to management
- I would protest the change
- I feel personally attached to the implementation of RPA
- I am afraid that RPA will replace me
- My career path in the world of automation is clear to me

Trust

- If I had my way, I wouldn't let leaders/line managers have any influence over issues that are important to me
- I am willing to let my leader/line manager have influence over matters that are critical to me
- I believe my leader/line manager will look out for my best interest
- I would be comfortable giving my line manager a task or problem which was critical to me, even if I could not monitor his/her (its) actions

- I would tell my manager if I made a mistake on the job regardless of the consequences
- I would share my opinion about sensitive issues with my line manager even if my opinion was unpopular
- I am afraid of what my line manager might do to me at work
- If my line manager asked why a problem happened, I would speak freely even if I were partly to blame.
- I trust my manager because I believe I have good reasons to do so
- My manager is very concerned about my welfare
- My manager is very good at their job
- There is a match between my manager's words and action

RPA

- RPA has replaced my routine or repetitive tasks
- RPA has increased the time I have to focus on other tasks
- RPA has improved my productivity
- RPA has made my job easier

RPA performance

- My bot performs as it is expected to
- My bot has frequent breakdowns
- My bot is continuously enhanced
- My bot makes my job easier
- My leader helps remove obstacles related to my bot

5.2 Sample used for data analysis

As part of this research, the researcher focused on obtaining a sample of 400, as highlighted in Chapter 4.5. This exceeded the 150-sample size recommended by G* Power and considered non-responses to obtain a minimum survey size of 200. The table and graph below highlight the sample actually obtained and the data that is ultimately used as part of the data analysis:

Table 1 - Summary of respondents

Item	**Frequency**	**%**
Responses received	313	100%

Responded “no” to screening question	38	12%
Survey pilot (refer to Chapter 5.5)	13	4%
Responses with no data	0	0%
Outliers removed (refer to Chapter 5.3)	38	12%
Final sample size	**224**	**71%**

A review of the sample indicated that 313 people attempted the survey that was sent to them via LinkedIn and email. Of these 313, the scoping question to proceed asked whether the employee was employed in an organisation that had applied RPA as part of its strategy. there were 38 respondents who answered “no” and were excluded from further data analysis since they would not have been able to contribute to the research question which questioned trust and the effective implementation of RPA. Once a respondent selected “yes” to the screening questions, all other questions were highlighted as mandatory, which ensured that no data was excluded due to incompletion. As mentioned in Chapter 4.5, the 13 respondents that were part of the pilot study were not included in the sample. The data was assessed for outliers which identified cases that did not belong to the data tested, evidenced by comparatively big residuals (Nuemayer & Thomas, 2017). The 38 cases identified as outliers were removed from the data analysed, as contained in Chapter 5.4 Assumptions Testing. Thus 71% of all data (224 cases) collected could be used for further data analysis.

The final sample equalled 224 respondents, which would have allowed for the use of CFA testing (Worthington & Whittaker, 2006). However, since the sample received was close to the 200 threshold required for this test, EFA testing was used instead (Worthington & Whittaker, 2006). This is unlikely to have adversely impacted the results obtained since the results of both processes are similar (Beavers, Lounsbury, Richards, Huck, & Skolits, 2013). This was supported by the reliability of the measures for trust, affective commitment and effective implementation of RPA as shown in Chapter 5.4. In addition, both EFA and CFA function in a similar manner and therefore produce results that are comparable (Beavers, et al., 2013).

The final sample of 224 is comparable to similar studies on trust in leaders, Mayer and Gavin (2005) had a final sample of 247, and Neves et al., (2018) a sample of 180. Such comparability in the sample to previous studies provided further evidence that the sample size was likely to be appropriate in the current study.

5.3 Assumptions testing

To assess the validity, the outliers identified in the data were removed. An initial view of histograms of the data indicated that these were not evenly distributed. The outlier test then identified whether there were outliers that had affected the normal distribution. Outliers represented data points that were significantly different from other data points (Nuemayer & Thomas, 2017). As highlighted in Chapter 4. Research Methodology, Mahalanobis tests were used to identify outliers and these were subsequently removed from the data analysed. An overview of the results of the outliers' test is included in the Appendix C which shows the outliers affecting the validity. In total, 38 outliers were removed from the data which improved the quality of the data analysis.

Affective Commitment

The Mahalanobis test results for AC displayed outliers impacting validity. An overview of the boxplots with regards to these is presented in Appendix. A total of 10 cases that related to AC were considered to be outliers and were removed from the data that was analysed. An overview of the AC outliers to be removed is included below.

Table 2 - Affective commitment outliers

			Case Number	Value
Mahalanobis Distance	Highest	1	133	30.04490
		2	210	29.08656
		3	101	27.01168
		4	85	24.65898
		5	6	23.49846
	Lowest	1	178	.68333
		2	218	.73246
		3	177	.73246
		4	157	1.05882
		5	112	1.05882

Trust

The Mahalanobis test for trust identified outliers affecting the overall validity of the data. An overview of the boxplots with regards to these is presented in Appendix. A total of 10 cases that related to RPA were considered to be outliers and were removed from the data that was analysed. An overview of the Trust outliers to be removed is included below.

Table 3 - Trust outliers

			Case Number	Value
Mahalanobis Distance	Highest	1	84	59.37987
		2	59	50.34636
		3	140	46.28844
		4	258	44.31916
		5	248	40.89851
	Lowest	1	236	.85820
		2	194	.85820
		3	190	.85820
		4	187	.85820
		5	173	.85820[a]

RPA

The Mahalanobis test results showed that there were RPA outliers that would significantly affect the overall tests. An overview of the boxplots with regards to these is presented in Appendix C. These outliers were removed from the overall data set to ensure validity of the sample. A total of 10 cases that related to RPA were considered to be outliers and were removed from the data that was analysed.

Table 4 - RPA outliers

			Case Number	Value
Mahalanobis Distance	Highest	1	137	57.38469
		2	65	56.59790
		3	37	39.56469
		4	209	34.48323
		5	208	28.30074
	Lowest	1	199	.26888
		2	91	.26888
		3	253	.76373
		4	251	.76373
		5	249	.76373[a]

RPA Performance

The Mahalanobis test on RPA performance highlighted cases that adversely impacted validity of the data. An overview of the boxplots with regards to these is presented in the Appendix. These outliers were removed from the overall data set to ensure validity of the

sample. These outliers were determined after the removal of the question “My bot has frequent breakdowns”, the removal of which resulted in a higher reliability score for this variable. An overview of the RPA performance outliers to be removed (which equalled 10) is included below.

Table 5 - RPA performance outliers

			Case Number	Value
Mahalanobis Distance	Highest	1	85	32.01219
		2	128	31.79901
		3	64	29.54974
		4	69	25.41005
		5	88	21.50903
	Lowest	1	260	.46536
		2	258	.46536
		3	257	.46536
		4	252	.46536
		5	245	.46536[a]

Once the outliers were removed, the normal distribution improved but was still skewed, however it reflected less variability than before. No further outliers were removed since this would have impacted the reliability of the data.

The validity of the data was further supported by the wave analysis, the pilot study, intercorrelations outlined in 5.7 Construct descriptive analytics and factor analysis contained in Chapter 5.6 Factor Analysis.

5.4 Reliability

Reliability was assessed using Cronbach's alpha which determined the consistency and repeatability of each construct applicable to this study, namely the effective implementation of RPA, affective commitment and trust (Creswell & Creswell, 2018). The optimal values indicating that the data is reliable, is when the score exceeds 0.7 (Gravetter & Forzano, 2017).

The scales for affective commitment include the reverse coding of negative questions which could have adversely impacted the reliability of the data. The question recoded included the following:

- I think that management is making a mistake by introducing RPA (AC3)
- I would protest the change (AC5)
- I am afraid that RPA will replace me (AC7)

The results indicated a high degree of internal consistency for RPA, affective commitment and trust in leadership with values exceeding 0.7. However, the reliability for RPA performance was 0.639 suggesting that the sample domain was not captured correctly (Churchill, 1979). The questions that comprised this sub-construct were analysed and one question appeared to contribute to the less than optimal reliability of 0.7. This question, "My bot has frequent breakdowns" was therefore removed. Following the removal of this question, the reliability improved from 0.639 to 0.811 which is an acceptable reliability for this study. A summary of each question (in RPA performance) contribution to alpha, if removed, is summarised in the table that follows.

Table 6 - Reliability test per question for RPA performance

RPA Performance	Cronbach's Alpha if Item Deleted
My bot performs as it is expected to (R1)	0,507
My bot has frequent breakdowns (R5)	0,811
My bot is continuously enhanced (R2)	0,519
My bot makes my job easier (R3)	0,447
My leader helps remove obstacles related to my bot (R4)	0,519

A summary of the alpha scores per construct is contained in the table below, after having been adjusted for the questions that adversely impacting the reliability test. The column for

Cronbach's Alpha after adjustment shows the new reliability scores following the exclusion of the question that adversely impacted reliability for the sub-construct of RPA performance, as discussed in the preceding section.

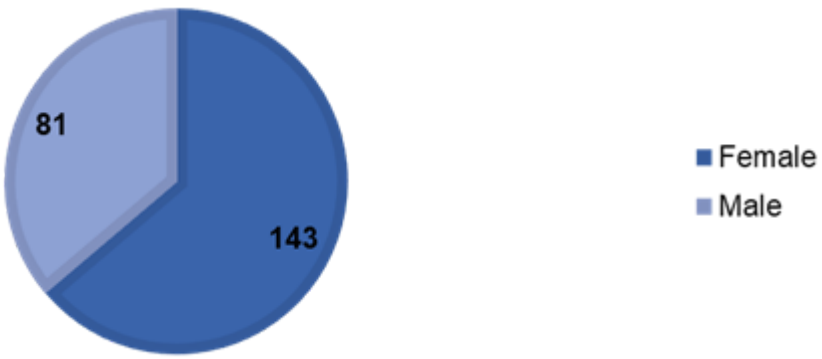
Table 7 - Construct reliability

Scale	N of Items	Cronbach's Alpha	Cronbach's Alpha after adjustment
RPA	4	.676	
Affective commitment	9	.742	
Trust	12	.894	
RPA performance	5	.639	.811

5.5 Descriptions of the sample

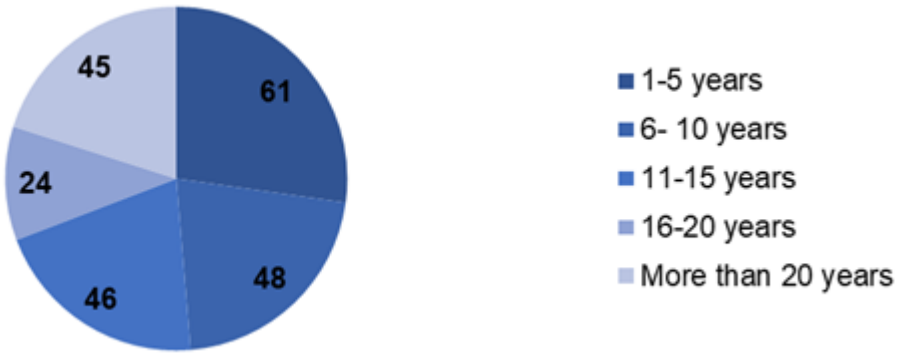
The section that follows considers the characteristics of the sample that responded to the survey questionnaire. The analysis of the respondents excludes the respondents that answered “no” to the screening question and excluded outliers which were removed as part of the validity tests. The objective of this chapter was to illustrate the understanding of the data used in the further analysis.

Figure 7 - Gender of respondents



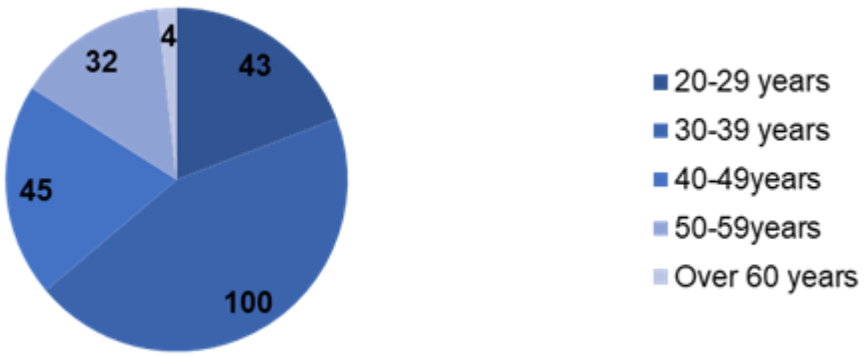
Included as part of the descriptive questions, the researcher added a question about the gender of the respondents to understand if the responses were skewed towards a particular gender. The data collected, as indicated in the graph above, shows that the sample comprised of 64% (143) female and 36% (81) male.

Figure 8 - Length of service



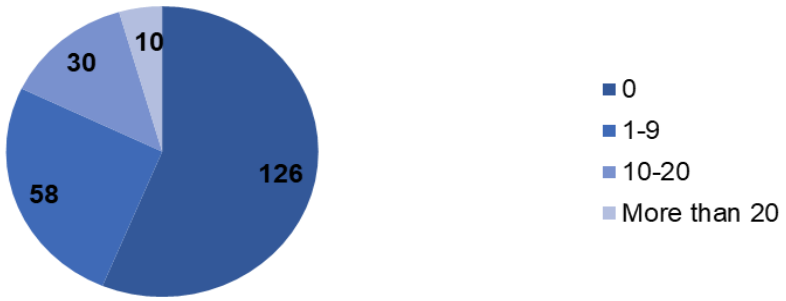
The researcher included a descriptive question on the length of service of the respondent in the sample. This was important to the study since studies show that trust grows over time (Mayer, et al., 1995; Schilke & Huang, 2018). From the data collected, as indicated in the graph above: 27% (61) of respondents in the sample indicated that they were employed by the organisation between 1 to 5 years, 21% (48) were employed between 6 to 10 years and 21% (46) between 11 to 15 years. Only 11% (24) of respondents were employed between 16 to 20 years while 20% (45) of employees were employed for more than 20 years. From the results, it is clear that the sample represents employees with varying lengths of service.

Figure 9 - Age of respondent



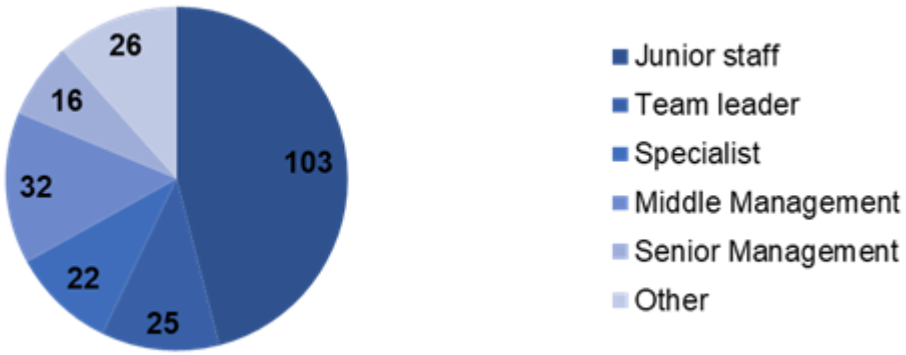
The researcher included a descriptive question on the age of the population which provided information as to whether trust levels relating to the implementation of RPA was influenced by the age of staff. The data collected, as indicated in the graph above, showed that: 45% (100) of respondents indicated that they were between 30 to 39 years, 19% (43) of respondents were between 20 to 29 years while 20% (45) were between 40 to 49 years. Only 14% (32) were between 50 to 59 years while 2% (4) were over 60 years. The results are therefore skewed towards younger respondents who are most likely to be impacted by RPA, if these are employed in task-oriented roles (Arntz, Gregory, & Zierahna, 2017). Therefore, the data collected is appropriate given the nature of the study.

Figure 10 - Number of subordinates



A descriptive question asked respondents about the number of subordinates that reported to them. This helped clarify whether the research population was general staff that are most impacted by RPA, or the leaders. The graph above summarises the response to this question and indicated that 56% (126) of those that responded had no subordinates. 26% (58) had between 0 to 9 subordinates and 13% (30) between 10 and 20 subordinates. Only 5% (10) of the respondents reported subordinates of more than 20.

Figure 11 - Job level



The previous descriptive question was supported by a further question that asked respondents about their level within the organisation. This question helped the researcher understand whether the research population was general staff that were most impacted by RPA, or the leaders. From the results obtained, as highlighted in the graph above 46% (103) of the respondents were general staff. This corresponds to the previous question where 56% of respondents indicated that they had no subordinates. 14% (32) of respondents were from middle management and 11% (25) at a team leader or “other level”. A combined total of 17% (38) of respondents were from senior management and specialists. General staff are expected to be cubicle works that are more susceptible to the technological unemployment resulting from RPA implementation (Le Clair, 2019). Therefore, the data collected is appropriate to respond to the research question.

Figure 12 - Level of education

A descriptive question was added to understand the level of education of the sample. The graph above summarises the responses to the question on education levels and indicated that 44% (99) of respondents had completed matric; 21% (47) of respondents had a diploma and 16% (36) had a Bachelor's degree. Collectively, only 19% (42) had an Honours degree, Master's degree or other qualification. There were no respondents that had a PhD in the data collected. An understanding of the skills level of the sample was important since RPA is expected to impact those in roles requiring lower skills (Davenport, 2015; LeClair, 2019). Within these roles, parts of jobs are expected to be displaced calling on employees to reskill to remain relevant (Davenport, 2015; LeClair, 2019; Wilcocks, 2016). Therefore, the sample provided appropriate information that affected the research question.

Figure 13 – Industry

A descriptive question was added to understand the industry in which the employee respondent was a member. The graph above summarises the responses to the question on industry and indicated that 79% (176) of those that responded were from the finance industry. The remaining 21% (48) of employees were from other industries, however this was a minority response. The question asked for further analysis of the industry, if the response was "other". The verbatims included under 'other', included nine people as being

part of banking which could be reclassified as part of finance. This represents 3,4% of the total number of respondents which would mean that 82,4% of the population was within the finance industry. RPA can be applied in any organisation that has simple, routine tasks (Lacity & Wilcocks, 2018). While it is applicable to all entities, it is possible that the pace of adoption may be faster in some industries compared to others such as auditing, accounting, workflow dependent industries (Harrast 2020, LeClair, 2002). As such, the sample collected enabled a response to the research question.

5.6 Factor analysis

The researcher used Exploratory Factor Analysis (EFA) to reduce the data from the constructs obtained from the questionnaire into a smaller set of variables. This enhanced the quality of information since the data was more manageable in small quantities. The section below summarises the factor analysis performed for RPA, affective commitment, trust and RPA performance. Detailed results from the EFA are included in Appendix D.

For affective commitment, KMO >0.5, Bartlett's <0.05 therefore EFA was deemed appropriate. The nine questions for affective commitment, loaded two components, with an eigenvalue of 3,574 and 1,617 representing 39,14% and 17,963% of the variance respectively. Therefore, the construct of affective commitment was split into two components, AC1.1 and AC1.2. The split was performed by analysing the means of the questions which resulted in four questions in component AC1.1 and five questions in component AC1.2. Once this was done, the questions allocated to each of the sub-components were added and the average per respondent calculated to form two constructs making up affective commitment.

For trust in leadership, KMO >0.5, Bartlett's <0.05 therefore EFA was deemed appropriate. The twelve questions for trust loaded on two components, with an eigenvalue of 6,131 and 1,209 representing 51,09% and 10,07% of the variance respectively. Therefore, the construct of trust was split into two components, T1.1 and T1.2. The split was performed by analysing the means of the questions which resulted in ten questions in component T1.1 and two questions in component T1.2. Once this was done, the questions allocated to each of the sub-components were added and the average per respondent calculated to form two constructs making up trust in leadership.

For RPA performance, KMO >0.5, Bartlett's <0.05 therefore EFA was deemed appropriate. Of the four questions for RPA performance, all loaded on a single component, with an

eigenvalue of 2,702, representing 67,54% of the variance. Therefore, all four questions were added and the average per respondent calculated to form the construct RPA performance.

For RPA, KMO >0.5, Bartlett's <0.05 therefore EFA was deemed appropriate. Of the four questions for RPA, all loaded on a single component, with an eigenvalue of 2,7479, representing 61,97% of the variance. Therefore, all four questions were added and the average per respondent calculated to form the construct RPA.

Since both RPA and RPA performance together form the construct of the effective implementation of RPA, the two question sets were analysed, using EFA, together to identify if these could be combined as one component. The results of the tests found that these constructs could not be combined.

5.7 Construct descriptive analytics

5.7.1 Individual question descriptive analytics

Affective commitment

The descriptive statistics for affective commitment showed that on average respondents agreed with the questions with averages of close to one for most questions. However, respondents for AC 4, indicated that respondents were uncertain whether they would present objections to management.

The coding language assigned a number to each of the selections on the Likert scale as follows: (1) Category for strongly disagree was assigned a number of -2, (2) Category for disagree was assigned a number of -1, (3) Category for neither agree nor disagree was assigned a number of 0, (4) Category for strongly agree was assigned a number of 2, (2) Category for agree was assigned a number of 1. This would account for the low means noted.

Table 8 - Descriptive statistics: affective commitment

	Mean	Std. Deviation	N
AC1	1,19	0,746	224
AC2	1,17	0,694	224
AC3	0,96	0,910	224
AC4	-0,04	1,139	224
AC5	0,88	0,986	224

AC6	0,34	0,939	224
AC7	0,37	1,275	224
AC8	0,67	0,979	224
AC9	0,64	0,917	224

There is a low degree of intercorrelation between the items that make up the affective commitment construct which suggest that there is no relationship between the constructs. This was unlikely to affect the research since these questions tested the employee's commitment to the change rather than the trust that they have in management. In addition, these scales were determined based on prior research which negated the need for purifying the measures.

Table 9 – Intercorrelation: affective commitment

	AC2	AC3	AC4	AC5	AC6	AC7	AC8	AC9
AC1	0,812	0,553	-0,022	0,328	0,381	0,323	0,417	0,388
AC2		0,600	0,055	0,376	0,364	0,288	0,426	0,364
AC3			0,132	0,574	0,252	0,446	0,222	0,171
AC4				0,327	-0,191	0,008	-0,150	-0,110
AC5					0,072	0,277	0,104	0,162
AC6						0,167	0,402	0,280
AC7							0,343	0,265
AC8								0,566

Trust

The descriptive statistics for trust showed that the mean of close to 1 for most questions indicated that the respondent agreed with the question being asked. The question that was closest to neither agree not disagree was *"If I had my way, I wouldn't let leaders/line managers have any influence over issues that are important to me"* (T1), which reflects that respondents were more uncertain of this question.

The coding language assigned a number to each of the selections on the Likert scale as follows: (1) Category for strongly disagree was assigned a number of -2, (2) Category for disagree was assigned a number of -1, (3) Category for neither agree nor disagree was assigned a number of 0, (4) Category for strongly agree was assigned a number of 2, (2) Category for agree was assigned a number of 1. This would account for the low means noted.

Table 10 - Descriptive statistics: trust

	Mean	Std. Deviation	N
T1	0,31	1,079	224
T2	0,70	0,891	224
T3	0,73	0,947	224
T4	0,58	0,981	224
T5	1,13	0,856	224
T6	0,83	1,025	224
T7	0,80	1,096	224
T8	1,06	0,810	224
T9	0,91	0,904	224
T10	0,82	0,949	224
T11	1,02	0,855	224
T12	0,75	0,983	224

Individual correlations were conducted on the intercorrelation of the questions relating to trust. The results showed low degrees of correlation between some of the variables indicating that there was no definitive relationship between variables with a correlation of less than 0.7. These scales were determined based on prior research which negated the need for purifying the measures hence these were not removed. There were variables that had an optimal correlation, in the table below.

Table 11 – Intercorrelation: trust

	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
T1	.152*	.230**	0,092	0,063	0,126	.307**	0,123	.171*	0,111	.133*	.152*
T2		.543**	.478**	.345**	.331**	.159*	.410**	.490**	.398**	.403**	.428**
T3			.575**	.425**	.455**	.298**	.465**	.711**	.720**	.678**	.652**
T4				.465**	.428**	0,114	.443**	.520**	.469**	.455**	.522**
T5					.517**	.152*	.669**	.490**	.465**	.468**	.454**
T6						.196**	.585**	.545**	.503**	.465**	.447**
T7							.291**	.312**	.246**	.230**	.329**
T8								.650**	.568**	.627**	.598**
T9									.823**	.775**	.737**
T10										.762**	.751**
T11											.796**

RPA

The descriptive statistics for RPA show that there is a mean of 1 or close to 1 for most variables indicating that there was agreement with the survey questions. The variables close to zero indicate that the respondent neither agreed nor disagreed with the question. R3 is the closest question to 0 which suggests that some respondents were undecided on whether RPA made their job easier.

The coding language assigned a number to each of the selections on the Likert scale as follows: (1) Category for strongly disagree was assigned a number of -2, (2) Category for disagree was assigned a number of -1, (3) Category for neither agree nor disagree was assigned a number of 0, (4) Category for strongly agree was assigned a number of 2, (2) Category for agree was assigned a number of 1. This would account for the low means noted.

Table 12 - Descriptive statistics: RPA

	Mean	Std. Deviation	N
R1	1,33	1,457	224
R2	0,51	0,984	224
R3	0,45	0,955	224
R4	0,53	0,898	224

The intercorrelation results of the RPA variables showed that there are optimal degrees of correlation between R2 and R3; R2 and R4; and R3 and R4. This test supported the model for the development of scales specifically related to purifying the measures. Question R1 which asked if RPA replaced routine tasks did have intercorrelations that were close to zero. This question was not removed to better support the development of scales, since the inclusion of this question was necessary for the analysis and was supported by the benefits to employees outlined in Chapter 2 Literature Review.

Table 13 – Intercorrelation: RPA

	R2	R3	R4
R1	.186**	0,075	0,125
R2		.733**	.647**
R3			.786**

RPA performance

The descriptive statistics for RPA performance showed that there was a mean of close to 0 for most variables indicating that the respondent neither agreed nor disagreed with the question being asked relating to the operational performance of their bot. This could have been because (1) the question was not applicable since the processes of these employees had not yet been automated or (2) there was indecision on the applicability of the question.

The coding language assigned a number to each of the selections on the Likert scale as follows: (1) Category for strongly disagree was assigned a number of -2, (2) Category for disagree was assigned a number of -1, (3) Category for neither agree nor disagree was assigned a number of 0, (4) Category for strongly agree was assigned a number of 2, (2) Category for agree was assigned a number of 1. This would account for the low means noted.

Table 14 - Descriptive statistics: RPA performance

	Mean	Std. Deviation	N
RP1	0,44	0,785	224
RP2	0,40	0,751	224
RP3	0,50	0,787	224
RP4	0,49	0,857	224

The intercorrelation results showed that there were low degrees of correlation between most of the variables with correlation scores of less than 0.7, suggesting the absence of a relationship between these variables. This was critical in this study since intercorrelations close to zero had to be eliminated in terms of the Churchill (1979) method for developing scales. However, since none of these intercorrelations were close to zero, removal was not in question.

Table 13 – Intercorrelation: RPA performance

	RP2	RP3	RP4
RP1	.603**	.683**	.479**
RP2		.589**	.405**
RP3			.625**

5.7.2 Consolidated descriptive analytics

Following the factor analysis contained in Chapter 5.6 Factor analysis, construct descriptive analytics were computed using SPSS based on the groupings that were obtained.

Based on the results below, RPA and trust showed higher levels of agreement as compared to AC and RPA performance as evidenced by the higher means. This suggested that there was a belief in the value of RPA to increase productivity by replacing routine or repetitive tasks and to provide employees with the time to focus on other tasks. High values in trust suggest that employees believe in the ability, benevolence and integrity of their leaders (Mayer, et al., 1995). It also showed that there was an emotional attachment to the change with means of close to one for affective commitment. Only RPA performance showed means of closer than zero suggesting that there was some degree of uncertainty as to the bot performance.

Table 16 - Construct descriptive analytics

	Mean	Std. Deviation	N
RPA	0.7031	0.78060	224
AC1.1	0.7098	0.66840	224
AC1.2	0.6679	0.65942	224
T1.1	0.8540	0.70633	224
T1.2	0.5536	0.87915	224
RPA performance	0.4507	0.65160	224

Correlation tests on the constructs show that there was no definitive relationship between the constructs evidenced by a Pearson score of less than 0.7.

Table 17 - Construct correlations

	AC1.1	AC1.2	T1.1	T1.2	RPA performance
RPA	.324**	.235**	.257**	0,058	.440**
AC1.1		.386**	.551**	.312**	.568**
AC1.2			.254**	.526**	.263**
T1.1				.297**	.543**
T1.2					.135*

5.8 Inferential statistics

A t-test was used to compare scores relating to the effective implementation of RPA for those individuals with high trust versus those with lower levels of trust. The assumptions made were that (1) the data was continuous, (2) the data was randomly selected and (3) the data had a normal distribution. The dependant variable was RPA implementation which comprised of RPA and RPA performance scores. The independent variable was trust.

The categories of high and low levels of trust were split using the mean score for trust, after identifying the components that the variables could be split using factor analysis. The mean for trust, as per T1.1 is 0.854 in all categories. To compare trust and the implementation of RPA and fear of job losses, the trust scores were split between those that exceeded 0.8 and those that did not. Two components of trust were identified as part of this factor analysis, T1.1 and T1.2 as outlined in Chapter 5.6 Factor Analysis. However, T1.2 was not considered significant since it was comprised of two questions that would unlikely have impacted the results significantly. The t-test therefore considered T1.1.

5.8.1 T-test for trust and effective implementation of RPA

The constructs for RPA comprise of the subconstruct of RPA and the construct of RPA performance. These were two separate components as per the factor analysis (refer to Chapter 5.6 Factor Analysis) and t-tests were presented separately for these constructs.

Based on the split using to the mean, 144 respondents had scores above 0.8 and 80 respondents below 0.8. The RPA score averaged 0.809 where trust scores exceeded 0.8 and 0.5125 where trust scores were below 0.8 with a standard deviation of 0.08752 and 0.69458 respectively. The scores for effective implementation of RPA averaged 0.6667 where trust scores exceeded 0.8 and 0.0844 where trust scores were below 0.8 with a standard deviation of 0.61735 and 0,53655 respectively.

Table 18 - Descriptive statistics: trust

	N	Mean	Std. Deviation	Std. Error Mean
RPA				
Trust scores greater than 0.8	144	0,8090	0,80752	0,06729
Trust scores less than 0.8	80	0,5125	0,69458	0,07766
RPA performance				
Trust scores greater than 0.8	144	0,6667	0,61735	0,05145
Trust scores less than 0.8	80	0,0844	0,53655	0,05999

As part of the t-test, Levene's test was computed where F was above 0.05 indicating that the variances were equal (p>0.05). The test showed that the groups were statistically significantly different because the value in the "Sig. (2-tailed)" row was less than 0.05 with a score of 0.006 (p<0.05). Based on the results, there was a statistically significant difference in the effectiveness of RPA in trust scores above and below the mean suggesting that higher levels of trust affect the effective implementation of RPA. The table below displays the results from the t-test.

Table 19 - T-test: trust and implementation of RPA

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
RPA	0,209	0,648	2,764	222	0,006	0,29653	0,10726	0,08514	0,50791
RPA Performance	11,793	0,001	7,079	222	0,000	0,58229	0,08225	0,42020	0,74439

5.8.2 T-test trust and fear of job losses

As indicated in Chapter 5.8.1 144 respondents had scores above 0.8 and 80 respondents below 0.8. Fear of job losses had an average score of 0.62 where trust scores exceeded 0.8 and -0.08 where trust scores were below 0.8 with a standard deviation of 1.268 and 1.167 respectively.

Table 20 - Descriptive statistics: "I am afraid that RPA will replace me"

	N	Mean	Std. Deviation	Std. Error Mean
Trust scores greater than 0.8	144	0,62	1,268	0,106
Trust scores less than 0.8	80	-0,08	1,167	0,130

As part of the t-test, Levene's test was computed where F was above 0.05 indicating that the variances were equal (p>0.05). The test showed that the groups were statistically

significantly different because the value in the “Sig. (2-tailed)” row was less than 0.05 with a score of 0.000 ($p<0.05$). Based on the results, there was a difference in the fear levels reported in those that trust more as opposed to those that trust less. This suggested that higher levels of trust have an impact on the fear of job losses. The table below displays the results from the t-test.

Table 21 – T-test: “I am afraid that RPA will replace me”

Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
2,726	0,100	4,031	222	0,000	0,693	0,172	0,354	1,032

5.9 Analysis of research questions

5.9.1 Trust in transformational leadership and the implementation of RPA

An understanding of the data supporting this question required the analysis of (1) correlation of the survey questions for trust, RPA and RPA performance and (2) correlation of the factors of trustworthiness namely integrity, benevolence and ability (Mayer, et al., 1995). The analysis was conducted on the data after excluding questions with low reliability and the outliers identified. The correlation tests identified relationships between the constructs, with a correlation score closer to 1 depicting a stronger relationship.

The overall correlation matrix (refer to Appendix E) provided insights into the correlations that were applicable, namely between trust and implementation of RPA. Key insights from the correlation matrix show that there were low levels of correlation between the subconstructs of trust and RPA implementation since these were below 0.7. This indicates that there was no definite relationship between trust and the effective implementation of RPA. There were no significant correlations indicating a relationship between trust and the effective implementation of RPA. However, the results showed that the items were intercorrelated (as discussed in Chapter 5.7.1 Individual question descriptive analytics).

5.9.2 Factors of trustworthiness and the effective implementation of RPA

The factors of trustworthiness described as part of the integrative Mayer model include integrity, benevolence and ability (collectively referred to as factors of trustworthiness)

(Mayer, et al., 1995). These factors of trustworthiness formed the basis of assessing the dimensions of trust. The questions in the survey specifically included all these factors of trustworthiness. A summary of the content for each factor of trustworthiness is included below:

Integrity

- If I had my way, I wouldn't let leaders/line managers have any influence over issues that are important to me (T1)
- I am willing to let my leader/line manager have influence over matters that are critical to me (T2)
- I trust my manager because I believe I have good reasons to do so (T9)
- There is a match between my manager's words and action (T12)

Benevolence

- I believe my leader/line manager will look out for my best interest (T3)
- I would tell my manager if I made a mistake on the job regardless of the consequences (T5)
- I would share my opinion about sensitive issues with my line manager even if my opinion was unpopular (T6)
- I am afraid of what my line manager might do to me at work (T7)
- If my line manager asked why a problem happened, I would speak freely even if I were partly to blame. (T8)
- My manager is very concerned about my welfare (T10)

Ability

- I would be comfortable giving my line manager a task or problem which was critical to me, even if I could not monitor his/her (its) actions (T4)
- My manager is very good at their job (T11)

The section that follows delves deeper into the results related to the factors of trustworthiness. To do this, composite scores were calculated using SPSS. Factor analysis was not performed when calculating these scores since they relate solely to the factors of trustworthiness as defined by the literature review in Chapter 2 Literature Review.

The results showed that that there were high levels of trust as evidenced by higher averages for the factors of trustworthiness with averages ranging from 0.6585 to 0.8943, with standard

deviations ranging from 0.68643 and 0.78340. The individual factors of trustworthiness were consistent with the high levels of trust depicted in the overall analysis. The results are depicted in the table below:

Table 22 - Descriptive analysis: factors of trustworthiness

	N	Mean	Standard Deviation
Integrity	224	0.6685	0.68643
Benevolence	224	0.8943	0.68309
Ability	224	0.8036	0.78340

The mean for the components of RPA and RPA performance was noted as 0.7031 and 0.4507, as indicated in Chapter 5.7.2 Consolidated descriptive analytics. These components and the factors of trustworthiness were correlated against each other to identify if there was any correlation.

A correlation test on RPA, RPA performance and the factors of trustworthiness showed that there was no definite relationship between RPA implementation and the factors of trustworthiness as evidenced by correlation scores of less than 0.7. The intercorrelations between factors of trustworthiness however remained high which is consistent with the overall analysis. The results are depicted in the table below:

Table 23 – Correlation: implementation of RPA and factors of trustworthiness

	Benevolence	Ability	RPA	RPA performance
Integrity	.780**	.738**	.204**	.413**
Benevolence		.752**	.217**	.528**
Ability			.297**	.495**
RPA				.440**

5.9.3 Trust in transformational leadership and the fear of job losses

Descriptive statistics

The question relating to job losses as it appeared in the survey was “I am afraid that RPA will replace me” (AC7). The mean for this indicator showed that there was a mean of 0.37 with a standard deviation of 1.275. A summary of the descriptive statistics is included in the table below. When correlated with trust, the Pearson score was 0.327 indicating that there was no conclusive relationship between trust and the fear of job losses.

Table 24 - Descriptive statistics: “I am afraid that RPA will replace me”

	N	Mean	Standard Deviation
I am afraid that RPA will replace me	224	0.37	1.275
T1.1	224	0.8540	0.70633

This direct question provided insights into the views of the employees who had implemented RPA. The coding for this question was reversed since it was a negative question. The data collected indicated that 50.9% of the sample did not agree with the statement that RPA would replace them, 14.7% agreed or and 10.7% strongly agreed. Of the sample, 23.7% were undecided on whether RPA would replace them.

Table 25 – Response frequency: “I am afraid that RPA will replace me”

	Frequency	Percent
Strongly agree	24	10,7
Agree	33	14,7
Neither agree nor disagree	53	23,7
Disagree	64	28,6
Strongly disagree	50	22,3
Total	224	100,0

Another question closely linked to the fear of job losses was “My career path in the world of automation is clear to me” (AC9). The mean for this question was 0.64 with a standard deviation of 0.917 indicating that many respondents felt secure about their career path as highlighted in the table below.

Table 26 - Descriptive statistics: "My career path in the world of automation is clear to me"

	N	Mean	Standard Deviation
My career path in the world of automation is clear to me	224	0.64	0.917

The data collected, indicated that 60.7% of the sample considered that their career path in the world of automation was clear, 10,7% either disagreed or strongly disagreed. 29% of the sample were unsure of whether their career path in the world of automation was clear. A summary of the responses is contained in the table below.

Table 27 - Response frequency: "My career path in the world of automation is clear to me"

	Frequency	Percent
Strongly disagree	4	1,8
Disagree	20	8,9
Neither agree nor disagree	65	29,0
Agree	99	44,2
Strongly agree	36	16,1
Total	224	100,0

Based on the data above, the majority of the respondents indicated that they did not fear job losses and they felt that their career path in the world of automation was clear.

5.10 Conclusion

The purpose of the research was to determine how trust in transformational leadership impacted the effective implementation of RPA and whether trust in transformational leadership decreased the fear of job losses. To test this, statistical analysis focused on analysing the responses obtained, and testing the data for correlation between trust and effective implementation of RPA, and trust and fear of job losses.

The findings from the data collected indicated that a robust sample was obtained from a diverse range of respondents which improved the ability of the sample to represent the population. The reliability of the data per construct was assessed to be within optimal ranges and was therefore suitable for making conclusions relating to the results. Validity of the sample was initially a concern, but it was improved following the removal of outliers identified by the outliers' test which improved the overall quality of the data. The correlation tests

between the constructs showed that there was no correlation between trust and the effective implementation of RPA suggesting that there is no definitive relation between the variables. In addition, the findings showed there are no correlations between trust and a fear of job losses. However, the t-test for both questions showed that trust was statistically significantly different meaning that there was some relationship between trust and the effective implementation of RPA. This will be analysed further in the Chapter that follows.

CHAPTER 6 DISCUSSION OF RESULTS

6.1 Introduction

The objective of this research was to determine how *Trust in Leadership*, impacted the *Effective Implementation of RPA*. The primary research question was supported by a sub-question on whether *Trust in Leadership* decreased the *Fear of Job Losses*. Data to respond to the research question was collected from 224 employees who were employed in organisations which apply RPA as part of their strategy, such as financial services (Osman, 2019). The collected data was analysed providing insights into *Trust in Leadership*, RPA and more importantly, data to understand the impact of *Trust in Leadership* on *Effective Implementation of RPA* and the *Fear of Job Losses*.

The results from the testing indicated that there was statistical significance between the variables but there was no optimal correlation observed. A summary of the salient results is as follows:

(1) The statistical t-test conducted to understand whether *Trust in Leadership* impacts the *Effective Implementation of RPA* revealed that *Trust in Leadership* had a statistically significant effect on the *Effective Implementation of RPA* ($p<0.05$).
(2) There was, however, a low correlation between *Trust in Leadership* and the *Effective Implementation of RPA* (r for T1.1= 0.257 and 0.543 and r for T1.2= 0.324 and 0.135) indicating that there was no definitive relationship between these two variables.
(3) The statistical t-test conducted to understand whether *Trust in Leadership* impacts the *Fear of Job Losses* indicated that *Trust in Leadership* had a statistically significant effect on the *Fear of Job Losses* ($p<0.05$).
(4) However, the low correlation results showed that there was no optimal relationship between *Trust in Leadership* and the *Fear of Job Losses* ($r = 0.327$).

The results of the testing also reflected that employees trusted their leaders with an average of 0,8540 for trust, highlighting that on average, the 224 respondents agreed with the statements related to *Trust in Leadership*. This was also evidenced by employee's belief in the ability, benevolence and integrity of their leaders which had average scores of 0.8036, 0.894 and 0.66 respectively (Mayer, Davis, & Schoorman, 1995).

The results showed that employees were not afraid of job losses even though research points to the displacement of jobs as a result of automation like RPA (Arntz, Gregory, & Zierahna, 2017; Lacity & Wilcocks, 2018; Frey & Osborne, 2017). This is evidenced by an average score of 0.37 across the sample of 224, for the question on whether employees were afraid that RPA would replace them. These results were closer to the mid-point of zero

which indicated that there were a number of employees who were uncertain as to whether RPA would replace them. This is consistent with the research on the *Fear of Job Losses* which will be discussed further in this Chapter (Arntz, et al., 2017; Frey & Osborne, 2017).

The results showed that employees believed that RPA provided benefits to them that allowed them to be more productive by removing manual and repetitive tasks (Wilcock, et al., 2019). Furthermore, employees believed that bots performed optimally, however there was a degree of uncertainty inherent in the responses. This is evidenced by average scores of 0.7081 and 0.4502 for the benefits of RPA to employees and the RPA performance respectively. The additional insights gained from this study around RPA were linked back to the overall research questions and compared to the previous studies on RPA. This chapter considered the possible reasons for the results obtained and the implications of these results. The available research on RPA was limited, hampering in-depth interpretations, however the insights gained from this study can contribute to the body of literature.

The chapter commenced by discussing how the sample impacted the results obtained. It then discussed the results as they related to the development of measurement scales for RPA which were required given the dearth of literature on RPA. Following this the results of the factor analysis were interpreted. Core to this chapter is an interpretation of the results that are linked to the research question in the context of the literature review in Chapter 2 which follows from the detailed summary of the findings in Chapter 5 Findings. The insights obtained can provide information for businesses that are adopting RPA and can contribute to future research studies which will be discussed in Chapter 7 Conclusion.

6.2 Sample description

This study was two-fold and aimed to (1) understand the impact of *Trust in Leadership*, on the *Effective Implementation of RPA* and; (2) the impact of *Trust in Leadership* on the *Fear of Job Losses*. Therefore, the sample obtained to enable this understanding had to represent employees that were employed in companies that are implementing RPA and whose jobs could be impacted as a result of its implementation. As demonstrated in Chapter 5.2, 224 valid responses for the sample were available for analysis after the removal of (1) respondents that were not employed in organisations that deploy RPA, (2) respondents that were part of the pilot study and (3) respondents classified as outliers.

The results from the description of the sample indicated that the sample represented the population that it aimed to cover. Furthermore, the additional insights into the population revealed that there were key aspects in these categories that would enhance the

effectiveness of the study. The discussion that follows summarises these key characteristics that are relevant to the discussion of the results as they relate to the research question.

The sample included 64% female and 36% male respondents. Furthermore, the sample included respondents with various tenures in the organisation with 27% of respondents employed by the organisation between 1 to 5 years, 21% employed between 6 to 10 years and 31% employed between 11 to 15 years. Therefore 69% of the sample was employed in the organisation for less than 15 years. The age of the employees varied, with 45% of respondents in the sample in the age category between 30 to 39 years, 19% of respondents in the age category between 20 to 29 years and 20% in the age category between 40 to 49 years old. There were 56% respondents with no subordinates and 46% of the respondents were general staff. The majority of respondents did not have a tertiary education with 44% having completed matric and 21% of respondents having obtained a diploma. A significant majority of the sample, 79%, was from the financial industry with only 22% of employees from other industries. A review of the category “other” revealed that 3% of employees were from banking which would mean that 82% of the sample was from financial services.

The analysis of the sample above indicated that the respondents were from a diverse group which suggested that there was a high likelihood that the sample would represent the entire population. The sample was skewed in favour of female employees; but this was unlikely to affect the results obtained as it related to trust in leadership. There were no previous studies found indicating varying levels of trust between different genders. The sample was also skewed towards financial services, which is discussed more in the next paragraph.

A majority of respondents were from the finance industry. This was expected since financial services may be more inclined to adopt RPA due to the existence of manual, repetitive, mundane tasks that are ideally suited to RPA (Lacity & Wilcocks, 2018). The results confirmed research which highlights increased adoption in insurance and banking and companies using workflow solutions such as financial services (LeClair, 2020; Osman, 2019). In addition, finance services industries are likely to have a number of repetitive, manual processes that can be automated by RPA (Wilcocks, et al., 2019). While it would have been advantageous to solicit more responses from other industries, it is noted that these may not have been available given different adoption rates by different entities. Given the affirmation from other studies, the results from the study were unlikely to be adversely impacted by a majority of respondents being from financial services.

The varying lengths of service evident in the data collected would have enhanced the effectiveness of the study since trust (especially benevolence) is known to grow over time (Schoorman, et al., 2007). The variation in the length of service decreased the risk that the results were affected by the employees' perception of their leader over a period of time, with the length of service improving the level of trust in the leader (Dirks & Ferrin, 2002; van der Werff & Buckley, 2014). In this instance, since the sample comprised of employees with varying lengths of service, no conclusion could be reached on whether trust was impacted by the length of time employees had to form a perception of their leader.

The sample comprised a large number of general staff with lower levels of education. This could raise the question of whether the sample was representative of the entire population. However, the results are consistent with other studies that showed that employees in lower skilled jobs such as those with lower levels of education and general staff were most likely to be displaced by automation (Arntz, et al., 2017; Frey & Osborne, 2017; LeClair, 2019). In addition, these employees are likely to be in roles that were ideally suited to RPA with manual and repetitive tasks (Lacity & Wilcocks, 2018). This sample would therefore contribute to a robust discussion on the impact of *Trust in Leadership* in *Effective Implementation of RPA* and whether trust decreases the *Fear of Job Losses*.

The sample contained a high number of employees with no subordinates. Such employees are likely to be in roles that are suited for automation since they are rules-based, repetitive and mundane and could fall within the category of roles that would be replaced by automation (Arntz, et al., 2017; Wilcocks, Hindle, & Lacity, 2019). These employees are more likely to be in jobs requiring lower skills which have a higher chance of been automated (Autor, 2015; Davenport, 2015). Employees with no subordinates may also be uncertain as to how they feel about job losses with 15% of employees with no subordinates being uncertain of the impact that RPA would have on their jobs (World Economic Forum, 2020). This uncertainty is likely to have impacted the *Fear of Job Losses* which was relevant for this study since it looked at the impact of *Trust in Leadership* on the *Fear of Job Losses.*

6.3 Scale development for effective implementation of RPA

To respond to the research question on how *Trust in Leadership* impacted the *Effective Implementation of RPA,* measurement scales were developed for RPA since this was not a widely researched topic (Hoffmann, Samp, & Urbach, 2019; Syed, et al., 2020; Wilcocks, et al., 2019). As a result, measurement scales in literature that already existed were adapted to ensure that the measures on the survey represented the construct of effective

implementation of RPA (Hinkin, 1998). Had this not occurred, the findings reflected in Chapter 6.5 and Chapter 6.6 may have been different.

To adapt or construct these measurement scales, the Churchill model was used with particular focus on purifying the measure (Churchill,1979). This was tested by computing the coefficient alpha to determine the quality of the measure - with a low measure indicating that the questions did not support the overall construct (Churchill,1979). Purification of the items in the scale was accomplished by (1) reliability tests, (2) intercorrelation and (3) pilot studies.

To assess the purity of the measure, reliability tests were conducted on the constructs. The results showed that the reliability score for RPA reflected an alpha of 0.676 (rounded to 0.7) while that of RPA performance was assessed at 0.639. The results showed that the measure for RPA performance was not reliable since it was below the 0.7 benchmark for newly developed measures such as those relating to RPA (Hinkin, 1998). Therefore, an analysis on the individual items making up RPA performance was conducted to determine if there were any items that significantly decreased alpha to below 0.7. These questions were subsequently removed to improve the reliability. As a result, the item “My bot has frequent breakdowns” was removed which resulted in a revised alpha value of 0.811 which indicated a high degree of reliability. This indicated that the scales were appropriate for the study since the reliability was 0.7 and above (Churchill, 1979). A summary of the alpha levels for all the constructs (before and after purification) is included below.

Table 36 – Recap of reliability scores

Scale	**N of Items**	**Cronbach's Alpha**	**Cronbach's Alpha after purification**
RPA	4	.676	
Affective commitment	9	.742	
Trust	12	.894	
RPA performance	5	.639	.811

Purification also involved a review of the intercorrelations and the pilot study. The intercorrelation analysis showed that the items within the scales developed were intercorrelated and no items were removed as part of this analysis, since these were considered to be important for the study. The pilot study helped purify the measure since it represented a prior review of the scales. This was used in prior research to enhance the scales developed.

A summary of the items included or excluded from the final scales is included below.

Table 28 - Scale analysis

	Final analysis – include or exclude
RPA has replaced my routine or repetitive tasks	Include item
RPA has increased the time I have to focus on other tasks	Include item
RPA has improved my productivity	Include item
RPA has made my job easier	Include item
My bot performs as it is expected to	Include item
My leader helps me remove obstacles relating to my bot	Include item
My bot has frequent breakdowns	**Exclude item**
My bot is continuously enhanced	Include item
My bot makes my job easier	Include item

The norms developed were considered to comparable thereby strengthening the results obtained from the study. This assessment was formed give that 224 cases were used in the analysis and that these were considered to represent the population as described in Chapter 6.2. In addition, the same was consistent with previous studies on trust which presents further evidence of the quality of the norms (Mayer & Gavin 2005; Neves, et al., 2018). This added with the reliability of the scores supported the view that the measurement scales were considered appropriate for the study.

6.4 Factor analysis

The sample included 224 respondents, which would have been acceptable to conduct a Confirmatory Factor Analysis (CFA) (Worthington & Whittaker, 2006). However, given that the number of respondents was close to 200, Exploratory Factor Analysis (EFA) was used instead. This is pertinent to the discussion since it shows how the constructs were analysed to support the discussion of the results in Chapter 6.5 and Chapter 6.6.

The results from the EFA showed that RPA and RPA performance represented one component which was not split further. A test was also performed to understand whether these could be combined since together they indicated *Effective Implementation of RPA*. This test showed that these were two separate components and therefore these were maintained as such. There is no research to support or refute these findings, however it is

noted that RPA questions analysed the employees' experience of RPA whereas RPA performance analysed the actual performance of the bot. This suggested that it was more appropriate to analyse RPA and RPA performance separately.

The results from the EFA showed that affective commitment and trust represented two components within their construct and therefore this was split for the analysis. The inferential statistics that followed used the sub-components identified through the factor analysis. Possible reasons for the split could point to the large number of questions, with nine questions for affective commitment and twelve for trust. Another reason for the added components could relate to the multidimensional nature of trust which could have meant that more components relating to trust were assessed than anticipated (Dirks & Ferrin, 2002). Therefore, there is a higher likelihood that these should be further broken down into two components. This was done as part of the study.

6.5 *Trust in Leadership* versus the *Effective Implementation of RPA*

The study aimed to understand the impact of *Trust in Leadership* on the *Effective Implementation of RPA*. The researcher's expectation was that there would be a relationship between *Trust in Leadership* and the *Effective Implementation of RPA.* This expectation was formed since *Trust in Leadership* has been known to improve change management and facilitate the effective adoption of new projects, such as RPA (Lippert & Davis, 2006; Men, Yue, & Liub, 2020).

The results of the study indicated that *Trust in Leadership* was high with an average score of 0,8540 highlighting that, on average, the 224 respondents agreed with the statements related to *Trust in Leadership*. This was also evidenced by employees' belief in the ability, benevolence and integrity (together referred to as the factors of trustworthiness) of their leaders which reflected average scores of 0.8036, 0.894 and 0.66 for each of the factors of trustworthiness respectively (Mayer, et al., 1995). For the purpose of this study, trust was understood to exist based on an employee's perception of the ability, integrity and benevolence of their leader (Mayer, et al., 1995). The results showed that employees trusted their leaders.

The results also showed that employees believed that RPA replaced routine, repetitive tasks, increased time to focus on other tasks and improved their productivity (Lacity & Wilcocks, 2018). The descriptive analytics for the questions relating to RPA and RPA performance showed average scores of 0.7081 and 0.4502 confirming that employees believed that RPA benefitted them and the RPA performance respectively.

The statistical t-test conducted to understand whether *Trust in Leadership* impacts the *Effective Implementation of RPA* revealed that *Trust in Leadership* had a statistically significant effect on the *Effective Implementation of RPA* ($p<0.05$). However, the results showed that there was no definitive relationship between *Trust in Leadership* and the *Effective Implementation of RPA* (r for T1.1= 0.257 and 0.543 and r for T1.2= 0.324 and 0.135).

The results of these tests are summarised in the figure below. This figure depicts the correlation of both components of trust (T1.1 and T1.2) and RPA and RPA performance separately. It also illustrated the correlation between the factors of trustworthiness and RPA and RPA performance.

Figure 14 - Correlation between trust and RPA

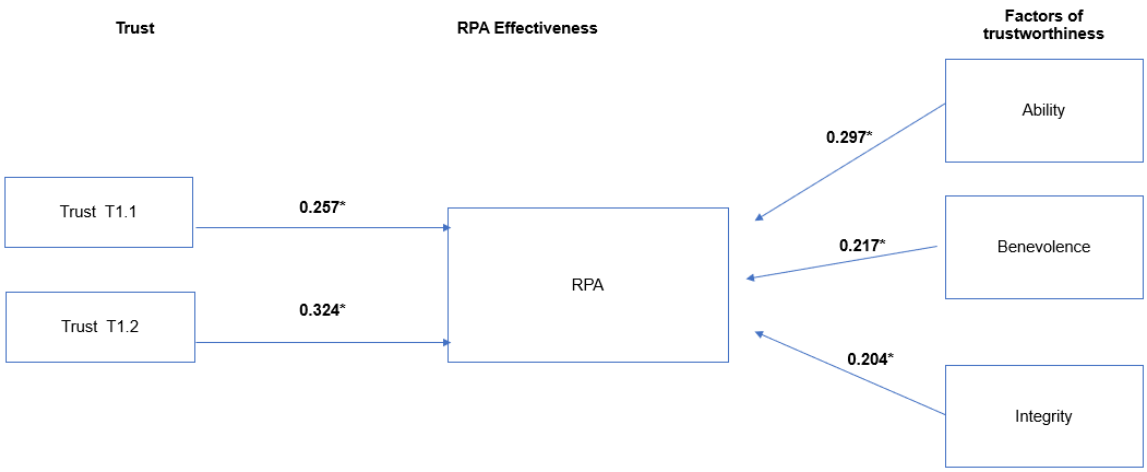
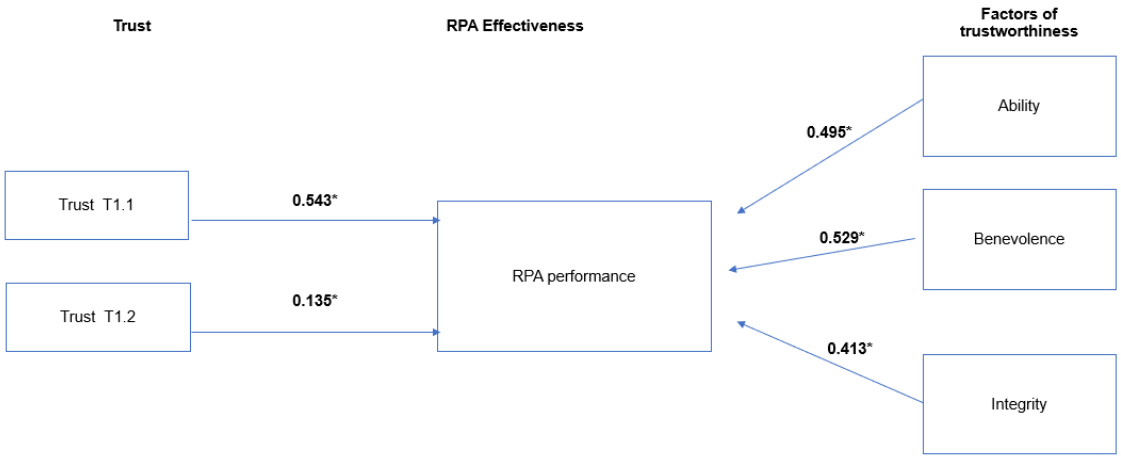


Figure 15 - Correlation between trust and RPA performance



The section that follows discussed the results in the context of *Trust in Leadership* with consideration as to how the factors of trustworthiness impacted the *Effective Implementation of RPA*.

6.5.1 Relationship between trust in leadership and the implementation of RPA

As mentioned in Chapter 6.5, the statistical t-test on the relationship between *Trust in Leadership* and the *Effective Implementation of RPA* revealed that there was a statistically significant effect between these variables ($p<0.05$). However, the results showed that there was no definitive relationship between *Trust in Leadership* on the *Effective Implementation of RPA* (r for T1.1= 0.257 and 0.543 and r for T1.2= 0.324 and 0.135). This section interprets these results and presents possible reasons for them.

The researcher's expectation that *Trust in Leadership* has an impact on the *Effective Implementation of RPA* was not achieved since the results showed that there was no optimal correlation between the two variables. There were no studies specifically related to the study on *Trust in Leadership* and the *Effective Implementation of RPA*, therefore, other studies on *Trust in Leadership* and performance were used to interpret the result. There were a number of studies around *Trust in Leadership* and its impact on performance with new insight into this phenomenon constantly being added (Addison and Texeira, 2020). However, the findings into the relationship between *Trust in Leadership* and performance presented inconsistent results with more research into this relationship being called for (Dirks & Ferrin, 2002; Mayer & Gavin, 2005). Some studies found that higher levels of trust were associated with higher levels of performance (Addison & Texeira, 2020). Others show that there were smaller but significant relationships between *Trust in Leadership* and performance (Dirks & Ferrin, 2002). Therefore, the results obtained in this study corresponds to some previous studies.

The inconsistent results related to *Trust in Leadership* and the *Effective Implementation of RPA* are most likely linked to the integrated model of trust and the definitions of trust used within this study. For the purpose of this study the Mayer, Schoorman & Davis integrated model of trust, as it related to the implementation of RPA was used (Dirks & Ferrin, 2002; Mayer et al., 1995; Poppo, et al., 2016). This model uses trust in the context of a relationship. However, the literature indicates that there are varying definitions of trust and some would fall outside of the relational model of trust used for this study (de Baisi, 2018; Mayer, et.al, 1995; Poppo, et al., 2016; Rousseau, et al., 1998). As a result, the lack of a relationship between *Trust in Leadership* and the *Effective Implementation of RPA* may be

the result of the definition of trust being insufficient or inappropriate for the purpose of this study (Dirks & Ferrin, 2002).

The scope of the study, as per Chapter 1.4 Scope of Research, considered trust in the context of a relationship. As a result, technology trust was excluded from the scope. This form of trust is however applicable to how employees would trust the automation, such as RPA (Lipper & Davis, 2006). As a result, it is possible that the inclusion of technology trust as well as relational trust may have yielded different results.

The results of the findings are also impacted by the nature of trust. Trust is a multidimensional construct that is affected by multiple factors such as the factors of trustworthiness that were used within the context of this study (Mayer, et al., 1995). However, there are other elements of trust that were not considered as part of this study that may have linked more closely to the *Effective Implementation of RPA* such as transparency and predictability (Breurer, 2019; Mayer, et al., 1995). Such factors could have impacted the level of trust that employees have in leaders and could have influenced the result related to *Trust in Leadership* and the *Effective Implementation of RPA.*

Another possible impact to the results could be related to the type of leader selected for this study. For the purpose of this study, leadership was looked at in the context of line managers. The survey therefore provided a view on whether employees trusted their line manager. However, there are various forms of leaders such as direct line management and organisational leaders (Dirks & Ferrin, 2002; Mayer and Gavin, 2005). The use of different definitions of leadership could have played a part in establishing whether there is a relationship between *Trust in Leadership* and *Effective Implementation of RPA* (Dirks & Ferrin, 2002).

When looking at the trust relationship, the study considered the dyadic nature of trust (with focus on trust in leader) which could have had an impact on the findings of the study. For example, trust is considered in a dyadic context between the leader and the follower and the trust that the leader has in the follower may also have an impact on whether trust is related to the *Effective Implementation of RPA*. In addition, the overall trust levels may be impacted by the level of trust that the follower has in the team or in the organisation (Buerer et al., 2019; Fullmer & Ostrof, 2017; Gupta and Violet, 2016). A study by Gupta and Violet (2016) found that trust in the team did have a positive association with performance. These additional considerations of trust in teams as well as trust in the follower could have affected the relationship between *Trust in Leadership* and *Effective Implementation of RPA*.

The results of the study reflect *Trust in Leadership* at a specific point in time. However, perceptions around the ability, benevolence and integrity of leaders can change over time. (Baer, Matta, Kim, Walsh, & Garud, 2018; Mayer, et al., 1995; Men, Yue, & Liub, 2020; Schilke & Huang, 2018). This could be due to changes in the leader's behaviour over time (Breevart & Zacher, 2019; van der Werff & Buckley, 2014). Therefore, the results obtained for *Trust in Leadership* could be different if this study was repeated since the perceptions could have been influenced by change management actions that instilled additional beliefs over the course of implementation of RPA (Kotter, 1996; Lippert & Davis, 2006). These additional beliefs could have impacted whether there is a significant relationship between *Trust in Leadership* and the *Effective Implementation of RPA.*

Performance outcomes related to the *Effective Implementation of RPA* may be influenced by other outcomes that were not considered as part of the study (Dirks & Ferrin, 2002). For example, it is possible that *Trust in Leadership* should be correlated to organisational performance whereas in this study it is considered in the context of RPA adoption only (Mayer & Gavin, 2005). The performance outcomes relating to the implementation of RPA were derived from the academic literature that currently exists (Asatiani & Penttinen, 2016; Harrast, 2020; Hoffmann, et al., 2019; Lacity & Wilcocks, 2018; Lacity, et al., 2015; Madakam, et al., 2019; Osman, 2019; Santos, et al., 2019; Syed, et al., 2020; Wilcocks, et. al 2019). However, these performance outcomes may have been limited by the lack of academic research related to RPA (Syed, et al., 2020). Therefore, it is possible that the performance outcomes used for this study may not be complete.

6.5.2 Trust in Leadership

In response to the research question, *Trust in Leadership* was central to the discussion. The results showed the employees perceived their leaders as trustworthy with an average score of 0,8540 for trust indicating that on average, the 224 respondents agreed with the statements related to *Trust in Leadership*.

Affective commitment

A possible reason for the positive level of trust observed could be that employees were emotionally attached to the change (affective commitment was high) and this resulted in a high level of trust in their leaders (Xiong, Lin, Li, & Wang, 2016). The results from the test showed that affective commitment of employees averaged 0.7098 and 0.6679. These levels of affective commitment confirm prior research but are also rare, since employees are often

cynical when they encounter change, which impacts the success of the change (Herold, et al., 2007; Xiong, et al., 2016).

High affective commitment could arise from actions of leaders in implementing RPA. For example, the results could reflect a successful change management process or automation initiatives implemented by leaders which created positive emotions (Jones & Van de Ven, 2016). However, this cannot be linked specifically to the *Effective Implementation of RPA* Furthermore, leaders could have communicated the positive benefits arising from RPA automation, which could have increased affective commitment and the trust that employees have in leaders (Neves, et al., 2018). In addition, leaders could have communicated the impact (positive or negative) of implementing RPA to employees such that it decreased the stress and uncertainty associated with the change (Men, et al., 2020). These reasons support high levels of affective commitment and *Trust in Leadership*, however since affective commitment was not studied in detail as part of this study, there may be other contributing factors to the high affective commitment which was outside the scope of this study.

The results show that even with the high affective commitment, there is no conclusive relationship between affective commitment and trust. A summary of the correlation results is presented below.

Table 29 – Correlation results between trust and affective commitment

	T1.1	T1.2
AC1.1	.551**	.312**
AC1.2	.254**	.526**

Possible reasons for the lack of a correlation between affective commitment and trust could be similar to those discussed in Chapter 6.5.1. Alternatively, it could reflect that employees cannot yet perceive the relationship between the implementation of RPA as it is new and evolving over time.

Factors of Trustworthiness

The results included the factors of trustworthiness (ability, benevolence and integrity) which further evidenced the *Trust in Leadership*. The results for ability, benevolence and integrity showed average scores of 0.8036, 0.894 and 0.66 respectively indicating that most respondents in the 224 trust their leaders (Mayer, et al., 1995). The relationship between trust and the factors of trustworthiness is consistent with the integrative model of *Trust in Leadership* developed by Mayer, Schoorman & Davis (Mayer, et al., 1995). The existence

and strength of these factors of trustworthiness together, would impact the overall level of trust that employees place in leadership, which is evident in this study.

The results show high scores as they relate to the factors of trustworthiness (ability, benevolence and integrity) which correspond to high levels of *Trust in Leadership* showing that employees trust their leaders. These results are consistent with previous studies that show that the factors of trustworthiness are expected to result in higher levels of trust even though findings are not absolute (Mayer & Gavin, 2005, Mayer, et al., 1995). The factors of trustworthiness are closely linked to the behaviours of the leader and how employees perceive this behaviour based on observations of their leader (Mayer et al., 1995; Poppo, et al., 2016). However, while these factors are reasons that an employee should trust leaders, it does not consider the social aspects of trust such as the leader's behaviour towards the employee (Baer, et al., 2018). Social aspects related to trust could also have an impact on the level of trust observed in this study which would impact the levels of trust.

Each factor of trustworthiness was assessed individually in relation to the *Effective Implementation of RPA*. This was done to identify whether there were particular factors of trustworthiness that scored higher or had an optimal correlation with the *Effective Implementation of RPA*. This would have provided more insight into the research question and of trust itself. While there was no expectation that there would be a relationship between the *Effective Implementation of RPA* and integrity or ability, there was a possibility that there would be a relationship with benevolence. This supposition was arrived at since the implementation of RPA can cause technological unemployment (Frey & Osborne, 2017; LeClair, 2019). The implementation of programmes to reskill employees can mitigate the *Fear of Job Losses* and leadership commitment to implementing these changes reflects care (benevolence) towards employees.

The results from the 224 respondents of the survey indicate that employees believed that the leader had the ability to implement RPA, evidenced by an average ability score of 0.8039. This corresponds to high levels of trust which is consistent with the Mayer, Schoorman and Davis model of trust which indicated that employees would be more likely to trust their leaders if the leaders have the skills and competence related to RPA (Mayer, et al., 1995). It is likely that the perception of the ability of the leader was formed through engagement with the leader, with higher evels of engagement influencing the perception of ability more strongly.

In spite of employees' belief in their leader's ability, there was no definitive relationship between ability of leadership and the *Effective Implementation of RPA (r = 0.297 and 0.475)*. This is likely due to an inability to link trust to RPA implementation since RPA adoption is in its infancy. An alternate reason could be that there were a low number of engagements between leaders and their employees which prevented an assessment of the leader's ability (Baer, et al., 2018). As such, no significant relationship between ability and the *Effective Implementation of RPA* could be observed.

The results showed that the respondents believed that their leaders were benevolent with an average benevolence score of 0.8943. This means that employees believed that their leader would act in their best interest and that their leader cared for them (Mayer, et al., 1995; Mayer & Gavin, 2005, Poppo, et al, 2016). In this case, benevolence could be displayed if the leaders created a vision and strategy for the change and included the employee as part of this transformation to RPA (Kotter, 1996, Lewin, 1997, Wilcocks, et al., 2019). Alternatively, it could be displayed if the leader actively implemented reskilling programmes enabling employees to transition to future roles (LeClair, 2019). In this way the belief is built that the leader would act in their best interest and is concerned about their wellbeing (Legood, Thomas, & Sacramento, 2016).

In spite of employees' belief in their leader's benevolence, there was no optimal correlation between the benevolence of leadership and the *Effective Implementation of RPA* indicating that there is a low likelihood that these are related *(r = 0.217 and 0.528)*. This could be because benevolence develops over time and since RPA is relatively new, employees may have not yet observed how a leader is linked to the *Effective Implementation of RPA* (Baer, Matta, Kim, Walsh, & Garud, 2018). For example, leaders may have implemented appropriate reskilling programmes so that employees were not adversely impacted by RPA. However, since these have been newly implemented, employees may not believe in the programme's ability to reskill or they may have not connected it as actions of leaders. Another possible reason may be the nature of benevolence.

The absence of an observable relationship between *Trust and Leadership* and benevolence made also be due to a lack of visibility over programmes implemented to reskill employees for automation (Lippert & Davis, 2006). Further, such programmes may not yet exist or may not be effective with the result that employees do not view their leader's benevolence as impacting implementation of RPA. As a result, there is no observable relationship between benevolence and *Effective Implementation of RPA*.

The results showed that the respondents believed that their leaders had **integrity,** with an average score of 0.6685. This means that employees believe that their leader would adhere to a set of principles that is acceptable to them (Mayer, et al., 1995). In this case, the employees were confident that the leader would adhere to the new methods, models and processes inherent in the change to RPA and would implement changes to support employees (Jones & Van de Ven, 2016; Khan & Smuts, 2019). This could be accomplished through execution of a committed change plan or transparency and communication related to the implementation of RPA (Kotter, 1996; Lewin, 1997; Yue, Men, & Ferguson, 2019). Furthermore, integrity could be demonstrated by following through on plans to implement programmes to reskills employees thereby building trust.

Despite high levels of integrity, there was no concrete relationship between the benevolence of leadership and the *Effective Implementation of RPA (r = 0.209 and 0.413).* Possible reasons for the lack of a relation could be the perception of employees that leaders are not involved in implementation of RPA. Therefore, while the leader has integrity, this is not evident in the context of the *Effective Implementation of RPA*.

6.5.3 Effective Implementation of RPA

When assessing the *Effective Implementation of RPA*, the researcher asked if (1) routine tasks were replaced, (2) employees had time to focus on other tasks as a result of the automation and (3) RPA improved the productivity of the employees. In addition, the performance of the bot was also considered. Together these factors represented whether RPA was effectively implemented. This was then studied in the context of trust. The researcher's expectation, following a review of the literature highlighted in Chapter 2 Literature Review, was that respondents would agree that RPA provided these benefits. This expectation was reflected in the results from the testing which showed that on average the scores ranged from 0,898 to 1.457 indicating that employees agreed that RPA provided these benefits.

The results confirmed studies which showed that RPA automated mundane, repetitive manual tasks and increased productivity (Huang & Vasarhelyi, 2019; Lacity & Wilcocks, 2018; Wilcocks, et al., 2019). These benefits for employees would support organisational change as the automation moves organisations to a future state in line with organisational objectives (Agote, Aramburu, & Lines, 2016). A possible reason for employees believing in the value of RPA is that they have observed the impact of RPA on their routine jobs (Wilcocks, et al., 2019). In addition, the introduction of RPA may have allowed them to spend more time on more challenging tasks, thereby increasing their satisfaction with RPA

(Asatiani & Penttinen, 2016; Kokina & Blanchette, 2019; Lacity & Wilcocks, 2015; Lacity & Wilcocks, 2018; Wilcocks, 2016; Wilcocks, et al., 2019). The belief in RPA could also reflect the harmonious co-existence of bots and humans where each work on tasks that are ideally suited to them, with the bot working on repetitive tasks while the human manages any exceptions (Lacity & Willcocks, 2015). In this way, employees use their skills optimally, which is likely to result in them seeing RPA in a favourable light (LeClair, 2019).

The benefits for employees were supported by additional questions asking if the bot performed as expected. These questions were added since they supported the overall implementation of RPA and provided evidence of whether the change management to implement bots was successful. The results showed that the employees believed that the bots performed well and that they made their job easier with average scores ranging between 0,751 and 0.857. This was also consistent with the research by Lacity & Wilcocks (2018). The caution with these results is that the literature is not extensive with the result that there may be differing views in practice which have not been studied. This does present an opportunity for further research as highlighed in Chapter 7 Conclusions.

RPA could transform business, but its potential has not been fully realised since it is still a growing market (Harrast, 2020; Hoffmann, et al., 2019; LeClair, 2020). For this reason, RPA is not a widely researched topic and lacks theoretical foundation to assess it objectively as it relates to its application and development (Syed, et al., 2020). Therefore, the results of this study were conducted in the context of RPA in its infancy with reliance on a small body of academic studies. The dearth of literature also led to the creation of measurement scales to test the construct. These measurement scales were developed using the Churchill model (Churchill, 1979). While the measurement scales were assessed as reliable (refer to Chapter 6.3), the results may have been different if different questions were asked.

6.6 *Trust in Leadership* and the *Fear of Job Losses*

The main research question into the impact of *Trust in Leadership* on the *Effective Implementation of RPA,* was supported by a secondary question on whether *Trust in Leadership* led to a decrease in the *Fear of Job Losses.* To address the supporting research question, the employees who responded to the survey were questioned on their perception of *Trust in Leadership* and their *Fear of Job Losses*.

As indicated in Chapter 6.5.2, the results for *Trust in Leadership* reflected a score of 0,8540 for *Trust in Leadership* indicating that on average, the respondents agreed with the statements related to trust. This was also evidenced by employees' belief in the ability,

benevolence and integrity (together referred to as the factors of trustworthiness) of their leaders which further evidenced the trust with averages of 0.8036, 0.894 and 0.66 for each of the factors of trustworthiness respectively (Mayer, et al., 1995). These results were discussed in Chapter 6.5 and will not be considered further in this section

The results from the descriptive analysis relating to the *Fear of Job Losses* reflected an average response of 0.37 showing that most respondents were not afraid of job losses. In addition, the results also showed that an average score of 0,64 was achieved when employees were asked if they were certain of their future roles in the world of automation. While both these scores reflected an overall belief by employees that they were not afraid and that they were assured of their future, this average for the *Fear of Job Losses* was closer to zero indicating that there was still uncertainty. This was expected given the studies showing that automation could displace jobs (Arntz, et al., 2017; Autor, 2015; Brynjolfsson & McAfee, 2016; Davenport, 2015; Frey & Osborne, 2017).

The statistical t-test conducted to understand whether *Trust in Leadership* impacts the *Fear of Job Losses* revealed that *Trust in Leadership* had a statistically significant effect on the *Fear of Job Losses* ($p<0.05$). However, the results showed that there was no conclusive relationship between *Trust in Leadership* and the *Fear of Job Losses* (r for T1.1= 0.327).

There are no previous studies that considered the relationship between these two constructs. The section that follows (1) discusses the possible reasons for the *Fear of Job Losses* and, (2) discusses how *Trust in Leadership* impacts the *Fear of Job Losses*.

6.6.1 Fear of Job Losses

As highlighted above, the results showed that employees were not afraid of job losses as a result of the implementation of RPA. This result in not aligned with the researcher's expectation given that job losses are a consequence of technological change, which gave rise to an expectation that employees would be fearful as a result of the implementation of RPA (Autor, 2015; Davenport, 2015; Frey & Osborne, 2017; Marengo, 2019; Pham, Madhavan, Righetti, Smart, & Chatila, 2018; Wilcocks, et al., 2019). The section that follows considered possible reasons for this result.

The result could possibly be explained by the existence of an effective change management initiative which could have resulted in a decrease in the *Fear of Job Losses* (Wilcocks, et. al., 2019). Such a plan is likely to have outlined a vision and strategy for change and aligned these objectives with employees (Kotter, 1996). As a result, the employees most likely felt

comfortable with the change since they had been included in a readiness program that enables the acceptance, adoption and testing of RPA (DeBaisi, 2018; Lippert and Davis, 2006). In addition, through the alignment of goals and inclusion in the change management process, employees may have had to let go of any hardened beliefs that RPA is bad and may replace them (Lewin, 1997). As a result, employees are aligned to the vision and strategy and are guided through the confuson and uncertainty associated with changes like RPA (Kotter, 1996; Wilcocks, et al., 2019; Xiong, et al., 2016). The result of the change management process is that employees are less fearful of the impact on their jobs (Hechanova, et al., 2018; Kotter, 1996). Unfortunately, there was insufficient data to confirm whether the decreased *Fear of Job Losses* is attributable to an effective change management plan, but it could be an opportunity for further study.

Another possible reason for the low *Fear of Job Losses* is communication which is an important part of change management and could have affected the perceptions of RPA (Yue, et al., 2019). The low fear exhibited by the respondents could be the result of a communication plan that provided transparency as to the nature of RPA, the impact on employees, reskilling of employees to develop bots or for the changes to work as a result of the introduction of bots (Burnes, et al., 2018; Lacity & Wilcocks, 2018). Employees possibly received communication that helped allay their fears and are thus accepting of the benefits of RPA while less fearful of the negative impact it might have on their job.

The result of a low *Fear of Job Losses* in this study is coupled with employee certainty that their career path in the world of automation is secure. The results showed that 50.9% of respondents felt that their career path in the world of automation was clear. Such a future could be assured because the employees have already begun to transition to the new types of roles that have emerged from the introduction of new technology (Dodel & Mesch, 2020; LeClair, 2019). These new roles are relatively easy to obtain and include roles like bot managers, bot consultants and sophisticated data analysts (Asatiani & Penttinen, 2016). The acquisition of these new roles may have assured employees that there is no need to fear since they have already adapted their skill set (Card & Nelson, 2019; Wilcocks, et al., 2019).

Another reason why the *Fear of Job Losses* is low is that leaders could have enabled the transition of skills by effectively upskilling existing staff to new roles or moving employees to roles where human skills would still be required (Arntz, et al., 2017; LeClair, 2019). These roles require skills that bots do not possess such as customer relations officers, project management etc (Card & Nelson, 2019; LeClair, 2019). The reskilling of employees could have been demonstrated through programmes that cater for such reskilling with the result

that employees trust their leaders to take care of them even if their roles are impacted (Yue, et al., 2019). Such transition of skills has been shown to decrease the impact of automation on jobs through the creation of new jobs (Frey & Osborne, 2017). This could account for a low *Fear of Job Losses.*

An alternate view for the low *Fear of Job Losses* observed in the results could be that employees view job losses as temporary and expect that there would be an equal creation of new jobs (Marengo, 2019). This is supported by the World Economic Forum data which shows that new jobs are created even though old jobs are displaced as a result of technology (World Economic Forum, 2020). Even though the adjustment to new jobs is likely to occur over a longer period of time, an awareness of this by employees may alleviate their *Fear of Job Losses* over which new jobs might be created (Marengo, 2019; World Economic Forum, 2020). Observation of this occurring in organisations can decrease the *Fear of Job Losses* (Lacity & Wilcocks, 2018).

Possible reasons for a low fear of job losses can also be the result of automation augmenting employee work (Spencer, 2018). In this instance, employees are not replaced but rather work side by side with a bot to achieve better efficiencies (Lacity & Wilcocks, 2016). Here the automation would be seen as an ally that makes work easier rather than as a threat of replacement. It is likely that employees benefit from automation since it relieves them of mundane tasks by processing transactions quicker and more efficiently (Asatiani & Penttinen, 2016). As a result, they are able to focus on other more valuable tasks which they find more rewarding (Wilcocks, 2019). This increase in job satisfaction leads to a decrease in the fear of being displaced.

6.6.2 Relationship between *Trust in Leadership* and the *Fear of Job Losses*

The key purpose of the study was to establish whether *Trust in Leadership* impacts the *Fear of Job Losses*. The statistical t-test conducted to understand whether *Trust in Leadership* impacts the *Fear of Job Losses* revealed that *Trust in Leadership* had a statistically significant effect on the *Fear of Job Losses* ($p<0.05$). However, the results showed that there was no absolute relationship between *Trust in Leadership* and the *Fear of Job Losses* (r for T1.1= 0.327).

There are no prior studies that present evidence as to possible reasons for this result. However, it is possible that the reasons provided in Chapter 6.6.2 are applicable in this case as well. A summary of these possible reasons includes:

- There are multiple definitions of trust and some would fall outside of the relational model of trust used for this study (Mayer, et.al, 1995; Poppo, et al., 2016; Rousseau, et al., 1998). As a result, the lack of a relationship between *Trust in Leadership* and the *Fear of Job Losses* may be the result of the definition of trust being insufficient or inappropriate for this study (Dirks & Ferrin, 2002). As a result, there is no optimal relationship observed.
- Trust is a multidimensional construct that is affected by multiple factors such as the factors of trustworthiness that were used within the context of this study (Mayer, et al., 1995). Other elements of trust such as transparency and predictability could have impacted the findings but were not considered (Breurer, et al., 2019; Mayer, et al., 1995). Alternatively, the result could have been impacted by a lack of communication by leaders on the change plans and their role in managing the associated fear of job losses (Yue, et al., 2019). These factors could have affected the relationship between *Trust in Leadership* and the *Fear of Job Losses.*
- For the purpose of this study, leadership was looked at in the context of line managers. However, studies vary in terms of allocation of the levels of trust with some relating to direct line management and others to organisational leaders (Dirks & Ferrin, 2002; Mayer & Gavin, 2005). The findings could be different if the leader was defined differently.
- The study did not consider trust from the perspective of the trust in the employee or trust in the team which could have had an impact on the findings of the study (Buerer, et al., 2019; Fullmer & Ostrof, 2017; Gupta and Violet, 2016).
- The results of the study reflect *Trust in Leadership* at a specific point in time. However, perceptions around the ability, benevolence and integrity of leaders can change over time. (Baer, et al., 2018; Mayer, et al., 1995; Schilke & Huang, 2018). These changing perceptions could have impacted the relationship between *Trust in Leadership* and the *Fear of Job Losses.*

6.7 Conclusion

The purpose of this research was to understand how *Trust in Leadership* impacts the *Effective Implementation of RPA*, to support the studies into RPA which is growing in popularity in business (LeClair, 2020). This chapter summarised the results of the findings from the data collected to address the research problem contained in Chapter 3.

The study found that employees trusted their leaders. This was further supported by employees' belief that the leader had the ability, benevolence and integrity, justifying the

trust relationship. These beliefs would have been developed based on the leader's engagement with employees where such behaviour would be observed. The high trust level was also supported by results that showed that employees were emotionally attached to the change, hence employees showed affective commitment to the change (Hechanova, et al., 2018). The existence of affective commitment corresponded with the level of trust in leaders displayed, which was consistent with prior studies (Xiong, et al., 2016). The results are consistent with previous studies relating to trust and to the affective commitment of employees (Addison & Texeira, 2020; Dirks & Ferrin, 2002; Mayer & Gavin, 2005; Neves, et al., 2018; Xiong, et al., 2016).

The study confirmed that RPA will benefit employees as evidenced by the responses to questions related to RPA performance. These benefits would include increased productivity, removal of repetitive tasks and increased time to focus on more challenging work. The findings were consistent with the benefits highlighted in other studies related to RPA to date (Asatiani & Penttinen, 2016; Hoffman, et al. 2019; Harrast, 2020, Kokina & Blanchette, 2019; Osman, 2019; Lacity & Wilcocks, 2015; Lacity & Wilcocks, 2018; Syed, et al., 2020; Wilcocks, 2016; Wilcocks, et al., 2019).

The study showed that employees did not fear job losses. This could be linked to (1) employee knowledge that their job could be lost but that there are active plans by leaders to support them through the change; (2) change management supporting the implementation of RPA or (3) uncertainty as to the impact of automation. All of these factors require leadership to inspire, support and challenge the employees to adopt changes, adapt skills amidst fear and uncertainty of job losses (Breevaart & Zacher, 2019; Lippert & Davis, 2000, Mayer & Gavin, 2005). The result is that the employees felt secure in their future role in the world of automation and less fearful fo job losses.

A key finding as part of this chapter was that there is a statistically significant difference in *Trust in Leadership* and the *Effective implementation of RPA*. However, there is no definitive relationship between *Trust in Leadership* and the *Effective implementation.* Similarly, there is a statistically significant difference in *Trust in Leadership* and the *Fear of Job Losses*. However, there is no evidence of a relationship between *Trust in Leadership* and the *Effective implementation.* Possible reasons for these relationships can be traced back to the definition of trust, the focus on trust in line management as opposed to organisational leadership, the consideration of trust at a point in time even though it has been known to change over time, and the multidimensional nature of trust. The insights observed can inform

the impact on future studies and on businesses that are applying RPA, which is discussed in Chapter 7.

CHAPTER 7 CONCLUSION

7.1 Introduction

The purpose of this research was to understand the impact of trust on the effective implementation of RPA and whether trust decreased the fear of job losses. This study provided literature creating context for RPA, the change management around the implementation of RPA and the impact of trust in leadership on the implementation of RPA. The link between these topics was outlined in Chapter 2 Literature Review.

RPA is recognised as a software tool that is aimed at reducing mundane manual tasks (Lacity & Wilcocks, 2018). Such change in facilitated by mimicking human actions so that tasks normally performed by humans are replaced by bots (Asatiani & Penttinen, 2016). With its growing popularity with more organisations adopting this technology, it is perhaps natural that RPA will replace humans (LeClair, 2020). This leads to fear of job losses which can be mitigated by effective change management and if employees trust their leaders (Yue, Men, & Ferguson, 2019). Further to this, the nature of the change means that employees need to move beyond their fears to actually adopt RPA in business and this requires a transformational leader (Breevart & Zacher, 2019). While these concepts are understood, the research aimed to understand specific insights as to their relationships, which was considered part of the principal findings of this study.

The paper fulfilled the purpose of understanding the levels of trust in organisations adopting RPA as part of their business strategy, and its impact on the effective implementation of RPA and on the fear of job losses. In this way, it fulfilled it purpose of contributing to academic research on RPA, change management and trust. This chapter will focus on outlining the key insights obtained from the study through the statistical analysis of the sample used to test the research questions, as contained in Chapter 5 Findings. Further to understanding these findings, their implications for business could be used to improve the implementation of RPA in business which is becoming increasingly important given the growth in the RPA market.

The chapter will discuss opportunities that could be explored for further research. These opportunities will address the shortage of research into RPA and contribute to the further understanding of RPA implementation in business. The chapter concludes with the limitations inherent in the study.

7.2 Key findings

The purpose of this research was to understand how trust, specifically in transformational leadership, impacts the implementation of RPA. The primary research question will be supported by the sub-question that explores whether trust in transformational leadership decreases the fear of job losses. The section below represents the key findings obtained from the analysis of data supporting the response to this question.

A summary of the key findings is:

- There is a statistically significant difference in the effective implementation of RPA in high trust scores as compared to low trust scores. However, there is no optimal relationship between trust and effective implementation of RPA.
- There is a statistically significant difference in the analysis of the impact of trust on the fear of job losses, but there is no optimal relationship between trust and effective the fear of job losses.
- Employees trust their leaders and believe in their ability, benevolence and integrity.
- Employees believe that RPA does benefit them, and they are not afraid that they job will be replaced by RPA. In fact, the believe that their future in the world of automation is clear.

Relationship between trust and transformational leadership

The findings from the research provide evidence that there is no relationship between trust and the implementation of RPA. This is evident from the low correlation between these two constructs. However, as evidenced by the t-tests, there is a difference between implementation of RPA in respondents that display high trust scores as compared to those that have lower trust scores. This shows that trust does impact the effective implementation of RPA, even though there is no relationship.

The findings showed that there is trust in leadership on an overall basis when all the factors of trustworthiness, namely ability, benevolence and integrity are considered (Mayer, et al., 1995). The findings also show that employees believe in the ability of RPA to increase productivity, replace routine or repetitive tasks, increase the time to focus on other tasks and make the job of employees easier (Lacity & Wilcocks, 2018). These results are consistent with the literature review provided in Chapter 2.

Trust and fear of job losses

The data provides no indication of a relationship between trust in leadership and the fear of job losses evidenced by low correlations of less than 0.7. However, the t-test did indicate that there was a statistically significant difference between fear of job losses in trust scores that exceeded the mean, versus those that did not. As a result, this suggests that higher levels of trust result in decreased fear of job losses.

To reiterate, the findings showed that there is trust in leadership in all the factors of trustworthiness, namely ability, benevolence and integrity (Mayer, et al., 1995). The data also shows that employees are not afraid of job losses and are certain that their career path in the world of automation is clear. This could be interpreted as being somewhat contradictory to the literature review provided in Chapter 2, which shows that the impact of automation will lead to job losses, especially in roles that are more susceptible to automation (Autor, 2015; Davenport, 2015; LeClair, 2020). However, it is possibly reflective of programmes implemented by management to reskill employees for roles of the future (Frey & Osborne, 2017). Another explanation could be planned change management which provided sufficient information so that employees were comfortable with the change as a result of leadership creating the need for the change and minimising resistance to it (Hechanova, et al., 2018). In addition, management may have inspired, supported and challenged employees to change such that the needs of employees have been prioritised (Breevaart & Zacher, 2019).

7.3 Implications for business

RPA is an opportunity for business to gain a competitive advantage by reimagining its future (Wilcocks, Hindle, & Lacity, 2019). The insights from this study present a view of how employees experience RPA and its impact on them. While the results are mainly positive, the insights gathered provide an opportunity to learn more to enhance the effective implementation of RPA and further accelerate adoption.

Failure to implement RPA will mean that business will not realise the benefits for shareholders, employees and customers (Lacity & Wilcocks, 2018). While there is no relationship between trust and effective implementation, business would realise benefits from studying the relationship in these constructs in employees. Such information could strengthen change plans and enable enhanced change management which results in realisation of benefits for business.

A key link to the change management process is preparing employees for the future of work, whether through newly created roles or roles that utilise uniquely human skills (LeClair, 2019). The views of employees as it relates to the fear of job losses and their future employees would benefit from proactive programmes implemented simultaneously with the implementation of RPA. This is a critical implication since more jobs were lost in 2019 as a result of automation compared to those created (World Economic Forum, 2020). By implementing proactive sustainable programmes management can limit the impact of technological unemployment in their organisation. In addition, through these programmes, management could demonstrate their care of the employees and also implement sustainable plans to limit the impact of technological employment, thereby increasing trust levels even further.

The study provides insights from 224 respondents on how they experienced RPA and how they experienced trust in leadership. These insights can be used to identify additional trends in the data. Using this information, business can develop policies and processes for engaging with employees on changes that occur within organisations. Leadership of business could assess how they measure up in terms of the factors of trustworthiness and the potential opportunities that are available to increase trust further.

7.4 Opportunities for further research

The research findings and literature provide opportunities to study RPA, affective commitment and trust in more detail. The dearth of literature on RPA highlights the lack of findings that exist and there are multiple opportunities for research in this regard. Given the pace of RPA adoption, such studies could add to business knowledge and contribute to future academic literature. In addition, it also presents an opportunity to explore elements of trust in more detail.

To date, research into RPA has largely centered around case studies aimed at understanding the implementation of RPA in business but there is little research around the reasons why RPA implementation fails (Asatiani & Penttinen, 2016; Hoffmann, Samp, & Urbach, 2019; Lacity & Wilcocks, 2018). The case studies have identified a number of themes within RPA which range from: outsourcing arrangements, stakeholder buy-in, change management, customer service, the impact on employees and their jobs- but no one has looked at the role of the leader enabling this – and how trust affects this (Arntz, Gregory & Zierahna, 2017; Kokina & Blanchette, 2019; Lacity & Wilcocks, 2018). Further research into RPA is warranted given the increased popularity and adoption of RPA.

The study focused on one aspect linked to change management, namely trust in leadership and how it impacted the implementation of RPA. Given the growing popularity of RPA, other components of change management could also be considered to understand their link to RPA. Such future research could contribute to the studies on change management but also provide more insight on the importance of change management on emerging technology trends.

The exponential pace of automation makes the fear of job losses an ever-present concern for most employees (Brynjolfsson & McAfee, 2016). However, there are some roles that would be more at risk and therefore create more fear of job losses (Dodel & Mesch, 2020; LeClair, 2019). More studies are therefore needed on the impact of automation on jobs, specificlly in those roles more susceptible to automation. Such studies could include (1) leading automation change in spite of fear, (2) creating opportunities to prevent technological unemployment, (3) regulation to limit widespread job losses caused by automation. These topics would contribute to academic literature but also fulfil a stewardship function by providing insights for companies to affect more responsible change – change that does not damage more than it creates a future.

Research on trust is widely available but more insights on trust could still be explored. For example, this study contributed to academic literature by examining the influence exerted by trust on employees and the resulting willingness of those employees to adapt to change (Lippert & Davis 2006). However, the focus was on the trust that the employee had in leadership and failed to consider the dyadic trust relationship (relationship between follower and leader) (Costa, et al., 2017). Studies of dyadic relationships focusing on interpersonal relationships between both dyadic parties are lacking in academic research, with the majority of research focused on one individual in this relationship (Gooty & Yammarino, 2011). Further research could explore the dyadic nature of trust and its impact on automation.

Trust grows over time (Mayer, et al., 1995). Benefits could be obtained by exploring this study at some stage in the future and after some time has elapsed to identify if there is a change in the relationship between trust and the effective implementation of RPA. Such a study could also be an experimental study with different subject groups – employees who have known the leader for years and those that are new. These studies would provide insights into the impact of trust over time but would also add to the insights around RPA adoption over time.

This survey obtained data around affective commitment which represents the employee commitment to affect change (Hechanova, et al., 2018). The results from the questions surveyed found that there was a high level of affective commitment to implementing RPA. However, this could be explored in more detail to understand how affective commitment impacts the implementation of RPA. Such a study could be useful in understanding affective commitment and how it impacts implementation of RPA. This in turn could lead to accelerated automation as more employees become emotionally attached to the changes brought by RPA.

The results from the study show that there was no correlation between trust and RPA. Studies on trust and performance have shown inconsistent results. Future research could focus on the reason why these inconsistent results exists. This would provide more insight into the multidimensional nature of trust and contribute to studies on trust and its impact on performance.

7.5 Limitations of the research

RPA is an emerging technology with limited academic studies to date (Lacity & Wilcocks, 2018). Therefore, the theoretical basis for this study could have been more robust had there been more studies. However, the scarcity of literature on this topic was a motivation to complete this research given its importance to business and academia.

The lack of literature on RPA required the scales to be developed to address the research question (Churchill, 1979). As part of the methodology the scales were reviewed by employees exposed to RPA and who could be displaced or have been displaced as a result of RPA by using a pilot survey (refer to Chapter 4.6.4 Pilot survey). The pilot survey consisted of responses from 13 respondents. While the data was used to enhance the quality of the items, including more respondents in the same review could have enhanced the quality of the data collected and tested which form the basis of the findings (Wright, Quick, Hannah, & Hargrove, 2017).

The sample size based on the G*Power was determined as 100 individuals. However, the researcher aimed to use a minimum sample size of 400 employees since more than 200 respondents are required before Confirmatory Factor Analysis can be conducted (CFA) (Worthington & Whittaker, 2006). This was almost achieved with a response rate of 316 individuals. However, following the removal of employees that did not implement RPA as part of their strategy and the removal of outliers, the sample that could be used in testing was 224. This was very close to the 200 respondents required for CFA but the researcher

opted to use Exploration Factor Analysis instead. It would have been more advantageous to have an even larger number to support the use of RPA and improve the representativeness of the sample. However, this would not impact the results obtained from the study

The sample was intended to represent different industries that had adopted RPA as part of their strategy. The responses included 78% of employees from finance services. This concentration of responses highlights the fact that financial services industries are ideal candidates for RPA adoption (LeClair, 2020). However, the results obtained could have provided more robust findings had they included respondents from other industries that have adopted RPA as part of their strategy.

Data obtained from responses relating to the operations of the bot showed lower levels of agreement. This question was mandatory but should have been an optional question based on whether the employee actually had a bot in production. If there was no bot in production, this question should not have been answered. While, this could have enhanced the experience of completing the survey, it does not impact the overall findings from the study.

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APPENDIX A – SURVEY QUESTIONNAIRE

I am conducting research on how trust, specifically in transformational leadership, impacts the implementation of RPA. To that end, you are asked to complete a survey that assesses your level of trust in the leadership of your organisation. This will help us better understand the trust that employees place in leadership when implementing Robotic Process Automation (RPA) and should take no more than 15 minutes of your time. Your participation is voluntary, and you can withdraw at any time without penalty. Your participation is anonymous and only aggregated data will be reported. In addition, all responses received will remain confidential throughout the process. By completing the survey, you indicate that you voluntarily participate in this research. If you have any concerns, please contact my supervisor or myself. Our details are provided below.

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General questions

PART A

1. I am employed in an organisation that uses Robotic Process Automation (RPA) to automate processes.
    - Yes
    - No

2. Gender
    - Male
    - Female

3. Length of service
    - 1 – 5 years
    - 6 - 10 years
    - 11 – 15 years
    - 11 – 15 years

- More than 20 years

4. Age
    - 20 – 29 years
    - 30 – 39 years
    - 40 to 49 years
    - 50 – 59 years
    - Over 60 years

5. Number of subordinates
    - 0
    - 0 – 9
    - 10 – 20
    - More than 20

6. Job level
    - Junior staff
    - Team leader
    - Specialist
    - Middle Management
    - Senior Management
    - Other

7. Education
    - Matric
    - Diploma
    - Bachelor degree
    - Honours degree
    - Master degree
    - PhD
    - Other

8. Industry
    - Agriculture
    - Construction

- Education
- Finance
- Fishing
- Forestry
- Hospitality
- Manufacturing
- Mining
- Telecommunications
- Transportations
- Utilities
- Other

9. Industry: additional information

Please give us a brief description of your industry

Survey question
PART B1 - RPA
RPA has replaced my routine or repetitive tasks
RPA has increased the time I have to focus on other tasks
RPA has improved my productivity
RPA has made my job easier
PART B2 - Affective commitment
I am proud that my organisation is adopting RPA
I believe in the value of implementing RPA
I think that management is making a mistake by introducing RPA
I would present my objections regarding RPA to management
I would protest the change
I feel personally attached to the implementation of RPA
I am afraid that RPA will replace me
I feel that I am a part of the automation strategy
My career path in the world of automation is clear to me
PART B3 - Trust
If I had my way, I wouldn't let leaders/line manager have any influence over issues that are important to me
I am willing to let my leader/line manager have influence over matters that are critical to me

I believe my leader/line manager will look out for my best interest
I would be comfortable giving my line manager a task or problem which was critical to me, even if I could not monitor his/her (its) actions
I would tell my manager if I made a mistake on the job regardless of the consequences
I would share my opinion about sensitive issues with my line manager even if my opinion were unpopular
I am afraid of what my line manager might do to me at work
If my line manager asked why a problem happened, I would speak freely even if I were partly to blame.
I trust my manager because I believe I have good reasons to do so
My manager is very concerned about my welfare
My manager is very good at their job
There is a match between my manager's words and action
PART B4 - RPA Performance
My bot performs as it is expected to
My bot has frequent breakdowns
My bot is continuously enhanced
My bot makes my job easier
My leader helps remove obstacles related to my bot

APPENDIX B ABBREVIATIONS OF THE SURVEY QUESTIONS

Survey question	Abbreviation
RPA has replaced my routine or repetitive tasks	R1
RPA has increased the time I have to focus on other tasks	R2
RPA has improved my productivity	R3
RPA has made my job easier	R4
I am proud that my organisation is adopting RPA	AC1
I believe in the value of implementing RPA	AC2
I think that management is making a mistake by introducing RPA	AC3
I would present my objections regarding RPA to management	AC4
I would protest the change	AC5
I feel personally attached to the implementation of RPA	AC6
I am afraid that RPA will replace me	AC7
I feel that I am a part of the automation strategy	AC8
My career path in the world of automation is clear to me	AC9
If I had my way, I wouldn't let leaders/line manager have any influence over issues that are important to me	T1
I am willing to let my leader/line manager have influence over matters that are critical to me	T2
I believe my leader/line manager will look out for my best interest	T3
I would be comfortable giving line manager a task or problem which was critical to me, even if I could not monitor his/her (its) actions	T4
I would tell my manager if I made a mistake on the job regardless of the consequences	T5
I would share my opinion about sensitive issues with my line manager even if my opinion were unpopular	T6
I am afraid of what my line manager might do to me at work	T7
If my line manager asked why a problem happened, I would speak freely even if I were partly to blame.	T8
I trust my manager because I believe I have good reasons to do so	T9
My manager is very concerned about my welfare	T10
My manager is very good at their job	T11
There is a match between my manager's words and action	T12
My bot performs as it is expected to	RP1
My bot has frequent breakdowns	RP5

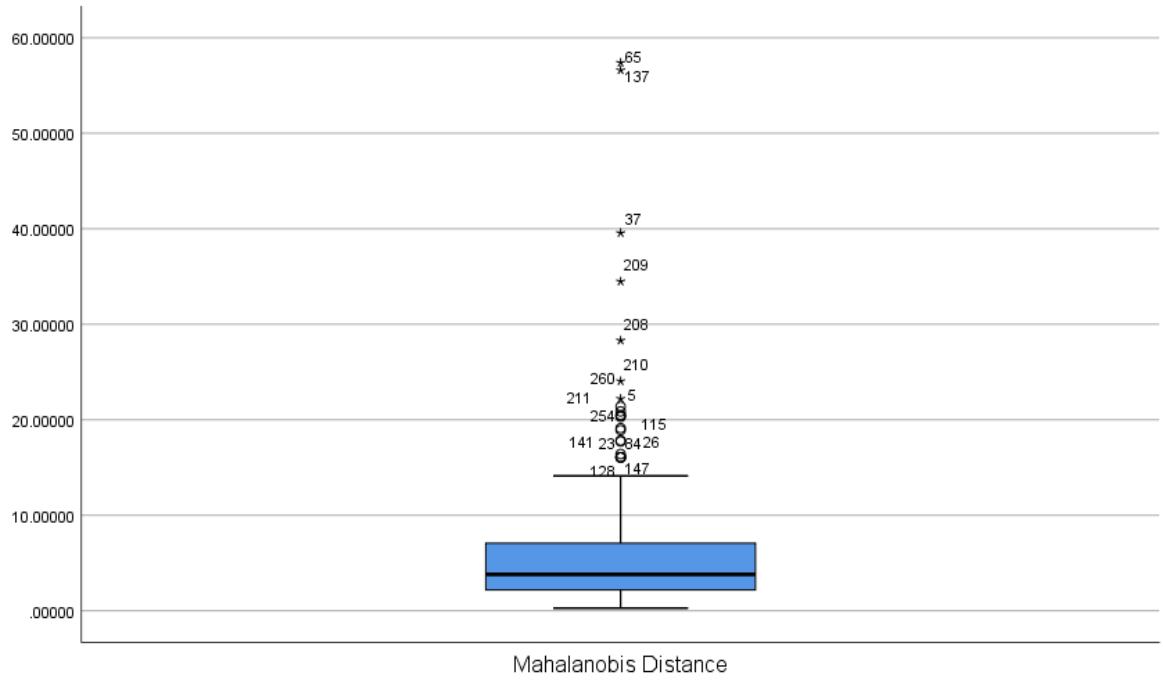
My bot is continuously enhanced	RP2
My bot makes my job easier	RP3
My leader helps remove obstacles related to my bot	RP4

In addition to these abbreviations for the survey questions, the following abbreviations where used to summarise the key constructs: RPA plus RPA performance – effective implementation of RPA and AC – affective commitment.

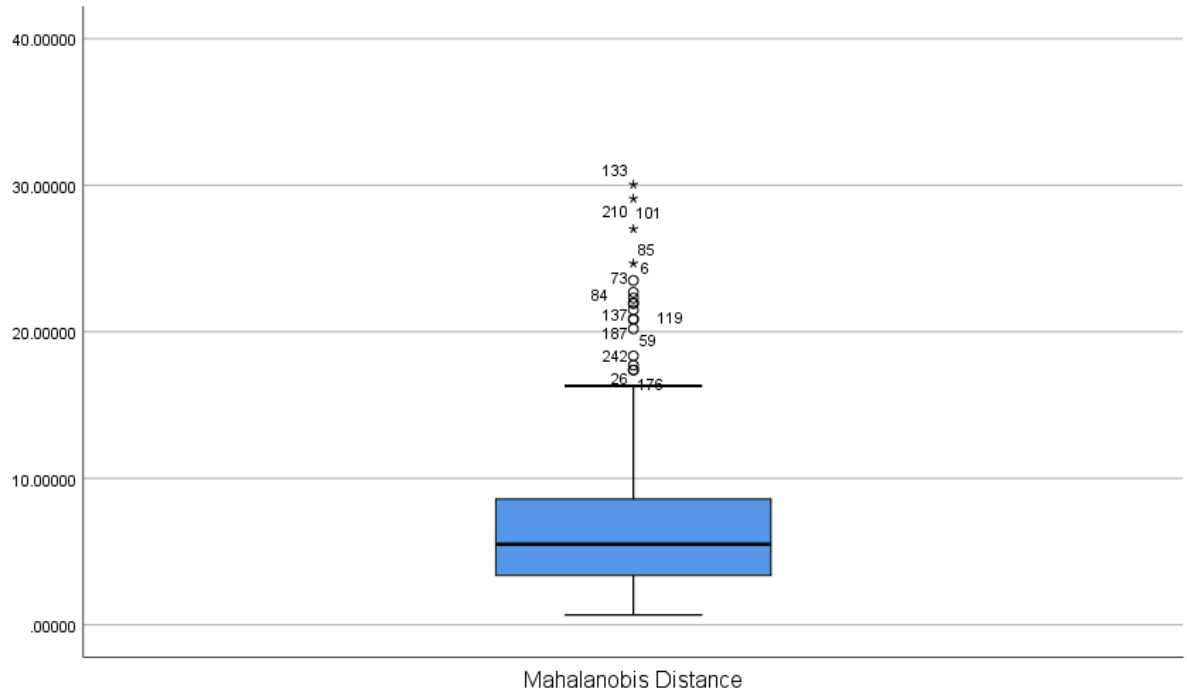
APPENDIX C OUTLIERS TEST RESULTS

This appendix contains the Mahalanobis tests for each of the constructs which was used to identify outliers as part of the assumption testing.

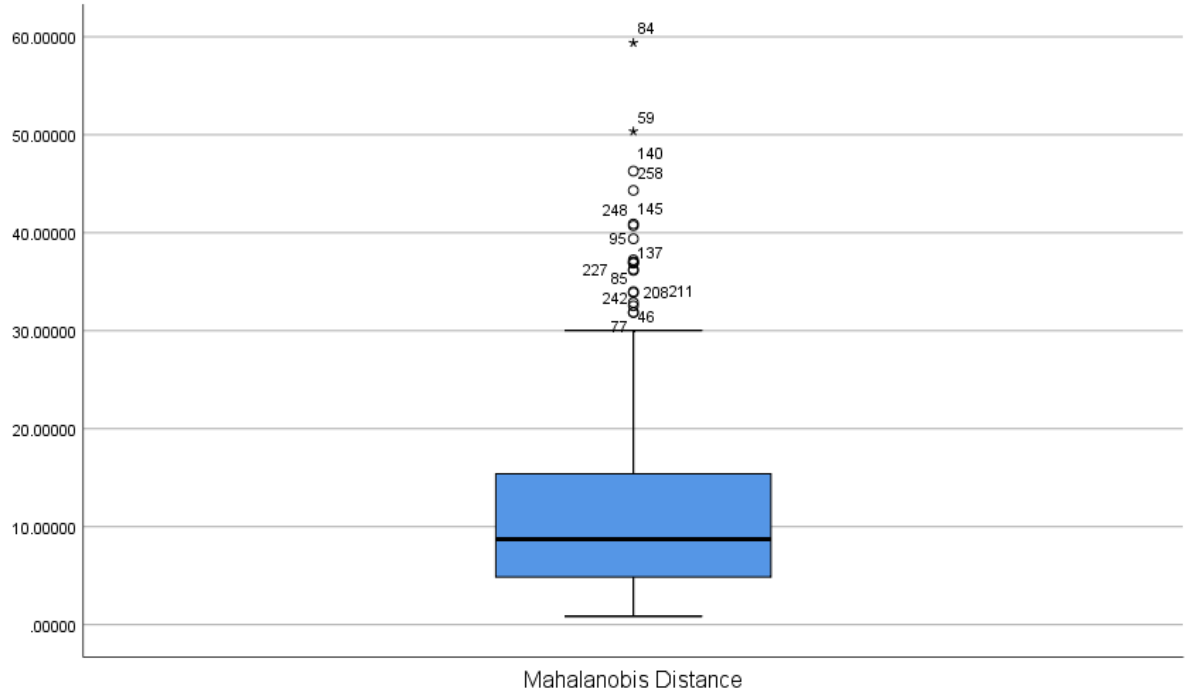
RPA



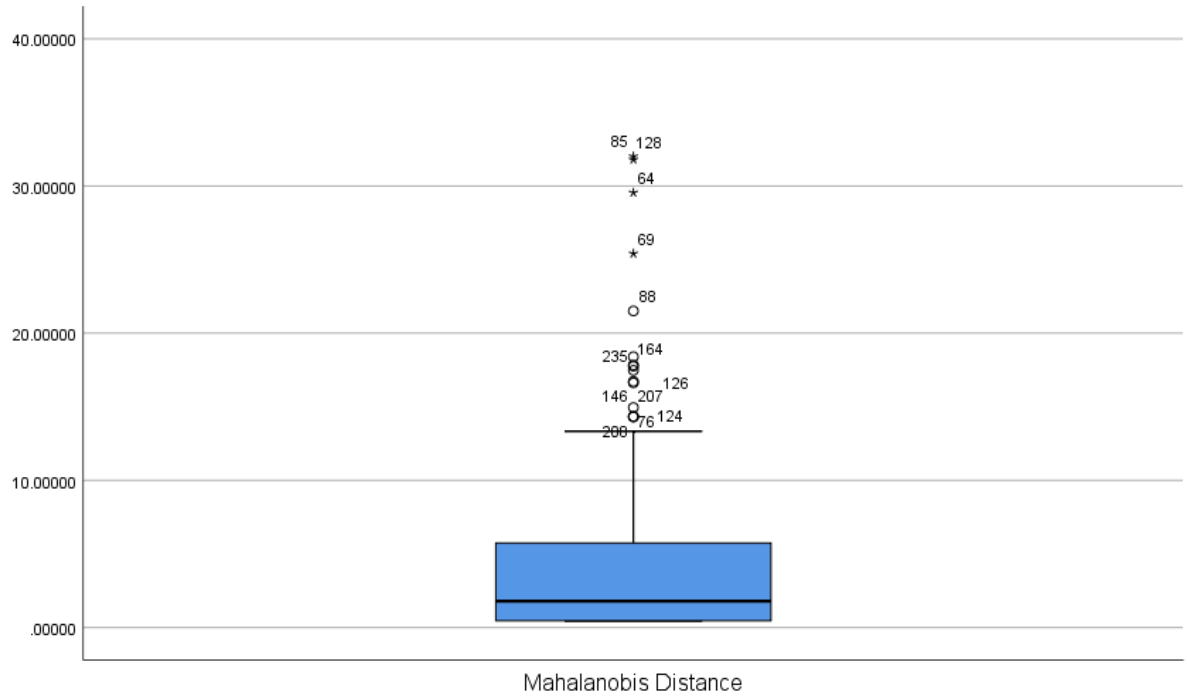
Affective commitment



Trust



RPA performance



APPENDIX D RESULTS FROM THE EFA

This appendix contains the results of the Exploratory Factor Analysis for each of the constructs.

Factor analysis on RPA

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,706
Bartlett's Test of Sphericity	Approx. Chi-Square	400,009
	df	6
	Sig.	0,000

Analysis of variance for RPA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,479	61,965	61,965	2,479	61,965	61,965
2	0,977	24,421	86,386			
3	0,354	8,843	95,229			
4	0,191	4,771	100,000			

Factor analysis on Affective commitment

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,766
Bartlett's Test of Sphericity	Approx. Chi-Square	745,190
	Df	36
	Sig.	0,000

Analysis of variance for affective commitment

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,574	39,714	39,714	3,574	39,714	39,714	2,618	29,085	29,085
2	1,617	17,963	57,677	1,617	17,963	57,677	2,573	28,592	57,677
3	0,896	9,959	67,636						
4	0,811	9,014	76,649						
5	0,656	7,289	83,938						
6	0,567	6,300	90,238						
7	0,398	4,426	94,665						
8	0,304	3,374	98,039						
9	0,177	1,961	100,000						

Defining the two components of affective commitment

	Component		Included in
	1	2	
I am proud that my organisation is adopting RPA	0,599	0,577	AC1.1
I believe in the value of implementing RPA	0,549	0,639	AC1.2
I think that management is making a mistake by introducing RPA	0,242	0,807	AC1.2
I would present my objections regarding RPA to management	-0,497	0,532	AC1.2
I would protest the change	-0,048	0,811	AC1.2
I feel personally attached to the implementation of RPA	0,662	0,079	AC1.1
I am afraid that RPA will replace me	0,349	0,449	AC1.2
I feel that I am a part of the automation strategy	0,783	0,119	AC1.1
My career path in the world of automation is clear to me	0,691	0,127	AC1.1

Factor analysis on Trust

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,901
Bartlett's Test of Sphericity	Approx. Chi-Square	1614,966
	df	66
	Sig.	0,000

Analysis of variance for trust

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6,131	51,093	51,093	6,131	51,093	51,093	5,818	48,483	48,483
2	1,209	10,077	61,170	1,209	10,077	61,170	1,522	12,686	61,170
3	0,915	7,621	68,791						
4	0,872	7,266	76,057						
5	0,656	5,463	81,520						
6	0,519	4,328	85,848						
7	0,505	4,207	90,056						
8	0,364	3,037	93,092						
9	0,267	2,224	95,317						
10	0,237	1,971	97,288						
11	0,183	1,523	98,811						
12	0,143	1,189	100,000						

Defining the two components of affective commitment

	Component		Included in
	1	2	
If I had my way, I wouldn't let leaders/line manager have any influence over issues that are important to me	0,024	0,811	T1.2
I am willing to let my leader/line manager have influence over matters that are critical to me	0,588	0,146	T1.1
I believe my leader/line manager will look out for my best interest	0,768	0,298	T1.1
I would be comfortable giving line manager a task or problem which was critical to me, even if I could not monitor his/her (its) actions	0,698	-0,010	T1.1
I would tell my manager if I made a mistake on the job regardless of the consequences	0,709	-0,078	T1.1
I would share my opinion about sensitive issues with my line manager even if my opinion were unpopular	0,681	0,051	T1.1
I am afraid of what my line manager might do to me at work	0,188	0,753	T1.2
If my line manager asked why a problem happened, I would speak freely even if I were partly to blame.	0,780	0,098	T1.1
I trust my manager because I believe I have good reasons to do so	0,858	0,233	T1.1
My manager is very concerned about my welfare	0,836	0,167	T1.1
My manager is very good at their job	0,831	0,170	T1.1
There is a match between my manager's words and action	0,811	0,242	T1.1

Factor analysis on RPA performance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,778
Bartlett's Test of Sphericity	Approx. Chi-Square	371,508
	df	6
	Sig.	0,000

Analysis of variance for RPA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,702	67,544	67,544	2,702	67,544	67,544
2	0,623	15,582	83,126			
3	0,396	9,909	93,035			
4	0,279	6,965	100,000			

APPENDIX E CORRELATION TABLE

	R2	R3	R4	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	RP1	RP2	RP3	RP4
R1	.186**	0,075	0,125	- 0,130	- 0,056	- 0,050	0,057	- 0,052	- 0,034	- 0,082	- 0,031	- 0,036	- 0,039	- 0,024	- 0,025	0,015	-0,067	- 0,019	- 0,009
R2		.733**	.647**	0,095	0,109	.302**	.273**	0,128	.200**	0,121	.171*	.289**	.243**	.253**	.242**	.408**	.284**	.498**	.372**
R3			.786**	0,101	.147*	.356**	.242**	.143*	.162*	0,082	.181**	.275**	.316**	.295**	.284**	.430**	.311**	.541**	.358**
R4				.133*	.209**	.372**	.321**	.203**	0,095	0,108	.174**	.229**	.232**	.230**	.234**	.464**	.283**	.549**	.382**
T1					.152*	.230**	0,092	0,063	0,126	.307**	0,123	.171*	0,111	.133*	.152*	0,040	-0,043	0,091	0,041
T2						.543**	.478**	.345**	.331**	.159*	.410**	.490**	.398**	.403**	.428**	.190**	0,060	.197**	.315**
T3							.575**	.425**	.455**	.298**	.465**	.711**	.720**	.678**	.652**	.389**	.272**	.471**	.487**
T4								.465**	.428**	0,114	.443**	.520**	.469**	.455**	.522**	.333**	.276**	.331**	.353**
T5									.517**	.152*	.669**	.490**	.465**	.468**	.454**	.248**	.240**	.342**	.384**
T6										.196**	.585**	.545**	.503**	.465**	.447**	.297**	.254**	.365**	.398**
T7											.291**	.312**	.246**	.230**	.329**	0,130	0,126	.160*	.162*
T8												.650**	.568**	.627**	.598**	.206**	.234**	.313**	.424**
T9													.823**	.775**	.737**	.340**	.284**	.392**	.537**
T10														.762**	.751**	.365**	.309**	.422**	.521**
T11															.796**	.293**	.272**	.397**	.505**
T12																.287**	.322**	.375**	.488**
RP1																	.603**	.683**	.479**
RP2																		.589**	.405**
RP3																			.625**