DEVELOPING A CHANGE MANAGEMENT METHODOLOGY FOR AUTOMATION PROJECTS IN SOUTH AFRICA

by

Luis Dancuart (REG1179345)

MINI-DISSERTATION

Submitted in partial fulfilment of the requirements for the degree

MASTER OF BUSINESS ADMINISTRATION

at

REGENESYS BUSINESS SCHOOL

Supervisor: Dr Dennis Laxton

June 2021

ABSTRACT

Many South African companies are adopting robotic process automation (RPA) to increase efficiency and productivity, reduce errors and risks, maintain a 24/7 working platform, and gain a competitive edge. RPA, as a solution, has a profound impact on employees. The two main determinants of the successful implementation of automation are its adoption in the workplace and its impact on the workforce. Although change management traditionally has been used to introduce new projects, the impact of RPA on people demands a more personal approach to encourage adoption and avert adverse outcomes.

This research aimed to understand which elements of change management contribute to the successful implementation of RPA for South African workers. The study followed a quantitative approach using a digital questionnaire to gather data from a sample of 103 respondents across multiple industries in South Africa. The questionnaire aimed to identify change management principles organisations apply in their implementation of RPA. The questions were categorised as key project metrics, employee involvement, job considerations, benefits beyond the organisation, impact on individual productivity, change management activities, and automation readiness.

The research identified a strong correlation between change management activities and successful RPA project implementation. Successful projects exhibited the following change management characteristics:

- Automation was not aimed at reducing headcount but rather at improving efficiency.
- The project was inclusive of all employees through the various stages of development.
- Training and employee preparation played a key role in employees' adoption and acceptance of RPA.
- Employers exerted significant effort to understand and plan job security, roles and responsibilities, and careers post automation.
- The benefits of automation were planned to extend beyond the organisation.

Job uncertainty and a volatile employment market have meant that South African workers need to focus more than ever on their careers and job security. Adopting and

accepting automation requires training and dedicated sessions that induce a sense of belonging and collaboration. Therefore, the change management function must play a dedicated and focused role in transforming any negative perceptions formed from automation initiatives. RPA must also demonstrate its positive effect on society in line with South African workers' values.

While the South African worker is not opposed to automation in principle, it is crucial that it is implemented in a manner that supports their career, cultural values, and personal developmental needs.

DECLARATION OF ORIGINAL WORK

I, Luis Dancuart, declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements of the Master of Business Administration degree at Regenesys Business School, Sandton, South Africa. It has not been submitted before for any degree or examination at any other university or educational institution.

Luis Dancuart

15 April 2022

for Cairo

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

CAD	Computer-aided design
DOI	Diffusion of innovations
ERP	Enterprise resource planning
HSRC	Human Sciences Research Council
ANOVA	One-way analysis of variance
RPA	Robotic process automation
SDLC	Solution development life cycle
TAM	Technology acceptance model
TPB	Theory of planned behaviour
TRA	Theory of reasoned action
UTAUT	Unified theory of acceptance and use of technology

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Robotic process automation (RPA) was introduced in the mid-2010s for mass consumption by industries. Companies quickly realised that automation would become a fundamental tool in achieving strategic objectives. Process automation offers increased efficiency in batch processing, reduced risk and errors, uninterrupted operations, and lower dependency on humans. Consequently, workers are concerned that automation will replace them, fully aware of companies' mission to gain market share while reducing operational costs.

As the demand for and adoption of RPA solutions grows, companies are investigating better ways to implement automation initiatives. In fast-growing companies, such as Tesla, the public and shareholders have come to expect automation (Muller, 2018). Companies associated with a high-tech culture can adopt automation with relative ease. Other giants, such as Toyota and Samsung, have successfully introduced automation by establishing a rapid deployment and adoption working culture (Shin & Kim, 2015). However, process automation is not always easy to adopt. Not all companies have the necessary structures and culture in place, and several have country laws that hinder or discourage the quick adoption of automation.

As consumers and shareholders demand more efficiency, companies need to address the question: "How best can I adopt automation without suffering losses?" The link between process automation and reduced manual intervention means that change management, which focuses on activities in which the workforce aligns and adopts automation, is likely to play an increasingly critical role.

This study aimed to explore the people engagement criteria and approach necessary for successful automation projects that met the cultural and individual demands of South Africa's labour force.

1.2 BACKGROUND TO THE STUDY

Global estimates suggest that as many as 61% of large companies have implemented automation initiatives, and an additional 19% have some sort of

automation agenda planned in 2022/2023 (IBM Watson, 2021). Companies are looking at process automation as the answer to increasing efficiency across their business units. Managers and executives are driving automation to cut costs, increase efficiency, or reduce the time needed to achieve outputs that will generate greater profits, new products, or bigger market share. It is no surprise that process automation has become a key development area for many consulting firms aiming to sign up new clients through their process automation methodology and approach. A survey conducted by McKinsey & Company in 2020 revealed a notable increase in companies adopting automation (Figure 1.1).

Table 1.1: Actions of organisations to adopt automation

Actions organisations have taken to automate business processes	**2018**	**2020**	**Effect**
	n = 1303	**n = 1179**	
Positive automation initiatives			
There is an automation program in place and automation technologies are scaling across the business	16%	15%	
Have at least one automation program but it has not yet been scaled across the business	13%	16%	
Piloting automation in one sector of the business	28%	35%	
Negative automation initiatives			
Have not yet begun to automate but have plans to do so in the next year	18%	14%	
Have not yet begun to automate and have no plans to do so	20%	16%	

Source: McKinsey & Company, 2020

Back-office automation, which is different from manufacturing automation, serves to establish efficiency across business functions. Its main benefits are improved process efficiency, reduced process costs and risks, and allowing employees to focus on value-adding activities (BusinessTech, 2019).

Unfortunately, process automation is not always successful, casting doubt on automation technologies as a whole (Fleming, 2020). Some companies have adopted automation very well and are reaping exponential rewards. However, this success comes from embracing change management that centres around people first and processes second.

Many employees consider process automation a job threat (Accenture Consulting, 2018), a “disease” that will replace them as it spreads across the organisation, progressively affecting its processes and people. Most large companies’ enterprise resource planning (ERP) processes are clearly defined and well suited for automation (Brown, 2015). However, when external consultants come in to implement automation, they are often more concerned with delivering the solution than considering the social and emotional implications for the workforce.

As automation projects are implemented across functions and processes, teams need to collaborate and support the business. In many cases, employees are not close enough to the organisation’s challenges to understand the purpose of automation initiatives (Morgan, 2014). Instead, they view it as a large-scale change that will impact their jobs, and that they can be replaced by a machine.

Given South Africa’s poor economic performance, there is a growing concern about the rising unemployment rate (Mseleku, 2021). These concerns fuel resistance to automation initiatives as workers equate automation with job losses. Evidently, employees lack an understanding of the positive implications of adopting new technologies and its potential benefits.

Technology is the gateway to growth, and companies are driving strong automation agendas to remain competitive, expand to new markets and continue to employ people. Therefore, companies need to make their employees aware that their skills, input, and work are not dispensable; instead, they are integral to the company’s success. Typically, companies that have successfully implemented automation have also increased their workforce, challenging the notion that automation will cause job losses. The real risk lies in employees’ limited understanding of automation and a lack of clarity as to how automation will benefit them (McKinsey & Company, 2019).

Change management is a key concept in project delivery methodologies such as the Project Management Body of Knowledge (PMBOK, 2021) and Prince II, which are aimed at the adoption of new solutions. Automation brings a new, previously overlooked dimension to the change management process, which is how some jobs can be made redundant. Therefore, change management must take a more emphatic view of how employees will be affected and align this change to the individual and corporate purpose.

A good change management methodology incorporates the following areas:

- Ensure that communication of the corporate strategic alignment supports the change in question – the planned change must align to one or more strategic initiatives, and the benefit derived must be quantifiable in delivering against strategic objectives (Vora, 2013).
- The change must carry a sense of purpose and positioning in relation to existing roles. Not only must the change be accepted as a company decision, but also as improving the delivery of current activities (Bhattacharyya, 2021).
- Ensure that the change has been effectively communicated and understood through an effective communication plan and supporting channels (Burke, Graham, & Smith, 2005).
- Plan the delivery of appropriate training to ensure that individuals involved are prepared for the change. This includes retraining to expand skills in their existing roles, training for new roles, and acquiring skills should their position fall away (Nwaohiri & Nwosu, 2021).
- Provide ongoing training and learning on the changing environment and on how to adapt to constant change (Leavy, 2015).

The research compared the outcome of automation implementation across several South African companies against the change management activities used. The aim was to identify which change management activities were directly related to the successful implementation of automation projects.

Several approaches to change management are outlined in the various project management methodologies. These methodologies provide guidelines and a variety of approaches that could be followed to successfully implement a desired outcome.

Previous research from Abdulla (2019) and Rafferty and Jimmieson (2017) both identified a lack of change management initiatives as a barrier to the successful implementation and adoption of RPA initiatives.

Special interest was placed in the lessons learnt by companies who had successfully implemented automation and those who had failed. The author's intention is to develop an automation change management plan to facilitate the transition of the South African worker from resisting automation to embracing and growing with automation.

1.3 THE RESEARCH PROBLEM

Based on the work by Abdulla (2019) and Tew (2019), the researcher postulated that RPA projects failed because of poor change management practices. Change management aims to bridge the gap between people and the functionality of a new technology or process (Vora, 2013). The upshot of a failed RPA project is increased operational costs, time wasted by project members, and the erosion of market advantage due to delays in seeking solutions.

The problem is that current change management practices do not adequately derive the required buy-in from employees to adopt RPA.

1.4 RESEARCH OBJECTIVES

Determining how change management can be effective in South Africa requires an exploration of the key change management principles. It also entails investigating how to align individuals' needs to the strategy used to relate to workers on a personal level, and to implement automation in such a way that they feel involved, valued and considered.

The research objectives incorporated several topics that, together, provided a broader view of the challenges facing companies and employees in successfully implementing automation projects. The objectives were:

1. To identify change management principles resulting in successful RPA implementation
2. To understand what actions may be taken by the change management team when implementing an RPA project

3. To understand the effectiveness of these actions and develop an effective change management plan.

1.5 RESEARCH QUESTIONS

The research objectives generated the following questions:

1. What is the correlation and variable strength between change management activities and the outcome of an RPA project?
2. What are the criteria for a successful RPA project?
3. How should the change management function support employees when dealing with change?
4. What is the correlation between a good change management approach and how employees' job considerations are addressed?
5. How can change management address employees' social and cultural concerns?

These questions were expanded on in the interview questionnaire presented to the research participants. The interview questions covered financial metrics associated with the projects as well as specific principles around the change management process. All these factors culminated in views of the measures of success of an automation project, and which change management approach was the most effective.

1.6 HYPOTHESIS TESTING

Hypothesis testing is used to determine whether the result of a study supports an associated theory (Leedy & Ormrod, 2010). This section examines the hypotheses that were tested during the research.

1.6.1 Training

Training is a change management activity that allows employees to understand how the solution will work and the functionality they should expect.

H_0: Training does not support successful RPA implementation.

1.6.2 Preparing employees for change

Preparing employees for any upcoming change is a function of change management. It entails sharing the future state of the process with employees and clarifying how it will affect their day-to-day activities.

H_0: Preparing employees for change does not support successful RPA implementation.

1.6.3 Training process

The training process determines how employees can better assimilate the functionality of the solution and incorporate it into their daily tasks.

H_0: The training process is not related to successful RPA implementation.

1.6.4 Job security

South African employees value job security, which can serve as a motivator to adopt automation.

H_0: Job security considerations are not related to successful RPA implementation.

1.6.5 Displacement of workers

As automation is introduced, tasks are assigned to RPA processes, resulting in the displacement of workers.

H_0: The displacement of people is not associated with successful RPA implementation.

1.6.6 Impact on careers

As processes are automated, individuals' careers and functions are affected. Change management must address the impact of automation on careers during the implementation of RPA solutions.

H_0: Careers are not impacted by successful RPA implementation.

1.6.7 Benefits to society

South African workers have expressed the need for their jobs to benefit society.

H_0: Societal benefits are not related to successful RPA implementation.

1.6.8 Changes in individual productivity

Automation reduces the manual effort of functions; how these tasks are incorporated into broader processes will affect individual productivity.

H_0: Reducing individual productivity is localised to single processes in successful RPA implementation.

1.6.9 Adoption readiness

As organisations increasingly introduce automation, their readiness to adopt it is affected by the automation outcomes.

H_0: Automation readiness is not related to successful RPA implementation.

1.7 RESEARCH ASSUMPTIONS

Three assumptions were made when conducting this research. When adopting or implementing automation, companies considered its impact on their employees and recognised the importance of change management (Ringim, Razalli, & Hasnan, 2012). Companies care enough about their people to be willing to reskill and redeploy them to other parts of the business (Abdulla, 2019). Automation is a strategic driver for continuous growth, and companies will continue to identify and implement automation opportunities (McKinsey & Company, 2019).

1.8 DELIMITATIONS OF THE STUDY

The delimitations of a study describe the boundaries of the research (Leedy & Ormrod, 2010). Automation is set to become a focus area for efficiency and development in many South African companies, providing a large sample for analysis. Therefore, large-scale, capital-intensive automation was excluded from the research. The study focused instead on desktop automation aimed at streamlining repetitive manual tasks and creating process efficiencies.

As there are many RPA vendors, such as UiPath, BluePrism, and MS Automation Anywhere, their core competencies and functionalities were not considered as any inherent differences are negligible (Gartner, 2021). Due to the similarities in the available software, the cost of the technology was considered a company-specific decision and, as such, was excluded as a factor influencing the success of RPA implementation. Because implementation timelines depend on the business

processes identified for automation and the implementation team's skills, they were excluded from the scope of this study. The study focused rather on the change management factors directly influencing how people adopt RPA technology. Therefore, the primary focus was on understanding change management initiatives and their impact on the implementation of RPA.

1.9 CONCEPT CLARIFICATION

In analysing the problem, the following concepts require further clarification:

1.9.1 Process automation

Process automation is the adoption of technology to reduce human activities within a defined process and can be simple or complex, depending on the nature of the business process. The main elements of process automation are: (i) gathering data and business rules; (ii) autonomously completing the desired process; and (iii) reducing the handling of any dependency of human interaction (UiPath, 2022).

1.9.2 Business process

Business process is defined as the sequential set of activities needed to complete a specific task or desired outcome. Business processes seldom work in isolation, usually requiring defined inputs and outputs. The outcomes of the business process are used to improve the business through operational decisions, corrective action, and/or internal alignment and collaboration (EY, 2021).

1.9.3 South African worker/employee

For the purposes of this study, the South African worker refers an employee who would be directly affected by automation initiatives. This study was limited to back-office workers and not plant or manufacturing staff.

The study also focused on current workers (now and in the immediate future), and not on workers who would enter the workforce in ten years' time. The reason is that innovation continues to evolve, and insufficient information is available to extrapolate the logic beyond the technologies currently being deployed in industry.

1.9.4 Change management

This refers to the management of change when implementing a new process or technology (Oxford University Press, 2016).

1.10 IMPORTANCE OF THE STUDY

Automation is evolving at a rapid pace and few businesses will not consider automation in the next two to five years (McKinsey & Company, 2019). Whether the automation is done at a back-office or front-office level, it will affect a large portion of the working population. This research was aimed at helping businesses to better engage with, support, and prepare their workforce in embracing automation.

For automation to be successful, it needs to fulfil two criteria: (i) to benefit employees, communities, and the South Africa economy; and (ii) to drive business growth and profits (EY, 2021).

The findings of this project will benefit organisations and consulting firms that are driving automation projects to achieve success, both by supporting the workforce and creating a positive financial impact for the organisation.

This research will need to be replicated as automation technology continues to evolve. However, focusing on how the workforce will be affected needs to become organisations' primary concern when adopting automated processes.

This study identified the criteria and activities needed to successfully transform South African organisations driving automation, both in terms of how their employees are supported and how their businesses will be transformed.

1.11 OUTLINE OF THE STUDY

This study comprises seven chapters:

Chapter 1 outlined how automation is fast becoming a key strategic initiative for many companies. Consequently, the implementation of automation is perceived by many as risky and disruptive. It discussed the importance of using a change management approach to ensure that automation is well received and adopted by the organisation.

In **Chapter 2** the relevant literature relating to automation, change management, and the South African worker is unpacked in relation to the problem.

Chapter 3 focuses on the research design, approach, and methods used in the study. Further expansion into the tools used to gather data and the data analysis are explained. The design and expected outcome of the questionnaire is explored, as well as the ethical considerations and limitations of the study.

Chapter 4 examines the results of the data, and how the data was gathered and structured to formulate the desired outcome of defining a methodology aimed at achieving the successful adoption of automation in the South African workforce. The reliability of the study regarding the quality of the methodologies applied and practical applications form the core structure of this chapter.

Chapter 5 discusses the findings and the design of the change management approach, including successful implementation methodologies, lessons learnt, and pitfalls encountered.

Chapter 6 discusses the practical applications of a newly defined change management approach and suggests change management decisions that will ensure the successful adoption of automation.

Chapter 7 combines the research outcomes into a guideline for employers to focus their efforts on using a structured approach to change management.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The literature review aimed to validate the purpose of the study by gathering data and understanding the applicable concepts, studies, and experiences. This study set out to complement the available information and add to the body of knowledge, which would allow others to benefit from the conclusions reached or ideas presented.

The literature review explored six main elements:

- The question as to why people innovate, focusing on the diffusion of innovations (DOI) theory
- Examples of innovation and how it has displaced, upskilled, and redesigned jobs
- Automation in the context of the organisational back-office – what it means technically and what is expected going forward
- The shift in focus to defining the expectations of workers when embracing automation
- The importance of change management – looking at change management methodologies, frameworks, and user acceptance theories
- What is important to the South African worker regarding work practices, personal and societal concerns, and work satisfaction.

2.2 WHY DO WE INNOVATE?

Innovation has been a critical part of human history, with significant changes in innovative evolution referred to as “industrial revolutions”. With innovation comes significant change in the products and services made available for mass consumption. However, along with these changes are changes in the active working population, with new skills being developed, old skills becoming obsolete, communities changing, new cities emerging, and economic powers being created.

The consensus is that the world has entered the fourth industrial revolution, but to appreciate its significance merits a brief overview of the previous three industrial revolutions to investigate the changes experienced. The first industrial revolution took place from around 1760 to 1840. It was defined as the period of mechanisation, when steam-powered machines were developed, displacing agriculture as the primary

economic activity. The introduction of machines led to the birth of other economic activities such as mining, engineering, housing, and mass urbanisation (Nwaohiri & Nwosu, 2021).

The second industrial revolution dates from the late 19th century, almost a century after the first one began, continuing into the early 20th century, just before World War I. It was characterised by the discovery of new sources of energy such as oil and gas, but it was the merging of these new fuels with existing machinery that created incremental gains and elevated humans to a higher plane of existence. The invention of the automobile, telephone and aeroplane can all be attributed to the second industrial revolution.

The third industrial revolution took place in the second half of the 20th century, about 50 years after the second, and was defined by the discovery of nuclear energy, which some authors maintain was the catalyst for the invention of the microchip, electronics, communication and computers (Fitzsimmons, 1994).

While some commentators argue that the current era is a continuation of the third industrial revolution, others contend that the birth of the internet, improved global connectivity, and advances in technology are enough to classify this era as a new industrial revolution. Either way, all agree that whatever the world is going through now is unprecedented and developing at an exponential rate (Schwab, 2016). The intervals between each industrial revolution are shrinking, providing less time to adapt and adopt new ways of working. The impact on people is profound, amplified by a world that is more connected than ever before. One thing is certain: the innovation experienced over the past 15 years has created a dependency on technology, both in industries and in people's daily lives, so much so that it would be difficult to return to the world of 15 years ago.

2.2.1 The diffusion of innovations framework

The diffusion of innovations (DOI) framework is a theory developed in 1962 by Everett Rogers. The DOI theory explains how, why and at what rate innovation has occurred. It is in the organisational context that the implementation of innovation with specific outcomes is further refined (Greenhalgh, Robert, Macfarlane, Bate, & Kyrikidou, 2004). The DOI framework comprises the four elements outlined in the subsections that follow.

2.2.1.1 Innovation decision process

In an organisational context, the decision process is authoritative (Kim, 2015), which may give rise to confusion regarding the rationale behind adopting an innovation. The result is a rejection of the innovation across the organisation. Innovation is considered successful when adopted at an individual level (Frambach & Schillewaert, 2002), and is initially achieved through communication channels that support the individual's view while driving the organisation's vision. At this point, individuals start seeing the innovation as an extension of the work they are doing and begin to embrace the change.

2.2.1.2 Innovativeness

Innovativeness represents the point at which the innovation is in its adoption cycle. Adoption is driven by the early adopters, usually categorised as a small group of experts or senior people in an organisation (Agarwal & Prasad, 1998). The measure of innovativeness determines how far along the adoption journey the innovation has travelled. If the innovation does not have the momentum to convert more early adopters to it drive mass adoption, it will fail. The level of innovativeness will determine the adoption rate, and whether the innovation is able to acquire mass adoption (Damanpour & Schneider, 2006).

2.2.1.3 Innovation characteristics

The characteristics that will drive the adoption of innovation are relative advantage, compatibility, trialability and observability (Rogers, 2003). These characteristics form the basis of the DOI framework to ensure that the innovation meets the minimum standards to be adopted successfully.

Relative advantage refers to the realisation of the advantage gained by the individual adopting the innovation and includes time, financial gains, increased throughput, or any other measure of benefit.

Compatibility is defined as the measure of how compatible the innovation is in the individual's life, And the expectation is that it does not create a negative disruption (Tornatzky & Klein, 1982; Cooper & Zmud, 1990).

Trialability refers to the complexity of the innovation. The more complex it is to operate, regardless of the advantage and the compatibility, the greater an individual's resistance to adopting (Straub, 2009).

Observability is the ease with which others can see the innovation at work and adopt it. The knowledge required for operation needs to be uncomplicated to drive adoption at a mass level.

2.2.1.4 Social system and communication

The adoption of any innovation is based on the ability of a group of people to share in the same benefit. When an innovation is introduced, only the early adopters can realise the benefit, although in some cases they may need to learn new skills and go through a phase of trial and error. As the individual begins to form subjective and objective opinions of the innovation, these notions are shared in a social environment. Individuals tend to comment and share their subjective views more than their objective ones (Straub, 2009). These social interactions create the right environment to raise awareness of the innovation and start its adoption journey.

Innovation is an integral part of the history of humans, who are constantly pushing the boundaries of knowledge and developing new and better products and services. Human beings yearn to innovate because it serves two clear purposes (Leavy, 2015). Firstly, it is supposed to make life easier – the pioneers of successful and adoptive innovation have always focused on improving how people live, interact, and grow. Secondly, based on the principle of capitalist markets, innovation leads to financial gain for an individual or a country (Schwab, 2016).

2.3 IMPACT OF INNOVATION ON THE WORKFORCE

Innovation has changed the way people perform their job functions. Although there are many examples of how innovations have disrupted the world of work, there are four main areas in which innovation has impacted the workforce as discussed below.

2.3.1 The elimination of jobs

Whenever new technologies are introduced, implemented, and adopted, there is an inherent danger that some skills will become obsolete, only to be replaced by the innovation, whether a product or service. When the innovation is a product, its

adoption is more tangible than a service. An example of this is the commercial introduction in 1959 of Xerox machines, the first copiers to enjoy mass adoption. Before the commercial Xerox machine, there were “typing pools” – groups of people who were hired to type and retype documents. These individuals were hired based on their typing ability and typically were not involved in other company operations. When the Xerox machine was introduced, they became redundant overnight.

Innovation can result in the elimination of certain jobs, and jobs that do not have multiple dimensions are easy targets for innovation (McKinsey & Company, 2019). One innovation can replace a single-dimension skill, and in the case of the typists, that one innovation can be easily scaled across industries and the entire job market.

2.3.2 Retraining people

Innovation can also result in people having to acquire a new set of skills. An example is the drafters needed for developing blueprints and building plans. When computer-aided design (CAD) software was introduced, drafters had to develop new skills to continue practicing their craft.

The fundamental difference between the drafters and the typists is that the drafter’s skill or creative ability was not lost, but rather the medium in which the output was produced changed. When CAD programs were introduced, drafters had to adopt and learn computer skills to remain relevant. In this case, the rate at which they adopted the technology (innovation) would determine whether they would retain the job for which they were trained.

2.3.3 Changing mindsets

The most recent example of how innovation has changed the workplace is people’s mindsets around job functions. The past decade has seen remarkable advancements in social media, which has affected a large percentage of the world’s population. Although marketing has been growing since the 1960s, it is only in the past decade, through innovation, that companies’ reach, and product interaction has changed. Marketers had to develop new thinking skills to execute campaigns and define their target audience (Addis & Podestà, 2005). Advertisements have become smarter and more emotive. Apart from the marketing profession’s natural evolution, marketers have had to shift their mindset and adapt to new ways of engaging with the end customer.

In addition, the internet and the many companies that promote connectivity have forced a change in the marketer's mindset. Good marketers did not lose their jobs, nor did they have to learn to use new tools, but they did have to adapt to a new way of marketing and rethink how best to engage with the customer.

2.3.4 The research context

It is human nature to evolve, and innovation is a natural extension of that evolution. People are constantly looking for new ways to make their lives easier (Rogers, 2003).

The sections that follow examine how innovation has affected the workforce and the mindset of its employees, who need to process the impact that innovation will have on them while being presented with new opportunities. Finding meaning in what is important to them is critical if they are to accept and embrace innovation and, ultimately, succeed.

2.4 RPA FOR BACK-OFFICE FUNCTIONS

Robotic process automation (RPA) mimics employees' actions; the more repetitive the functions, the easier they are to automate. By nature, RPA is not considered invasive; at its surface, RPA is able to complete processes based on a standard set of parameters or business rules. Surface automation is the RPA activity in which the "bot" logs into several applications via a front-end user interface or through an application programming interface (API), and process, copy, transpose, or report on data (Lacity, Willcocks, & Craig, 2015a). Because of the high capability of business processing and ease of implementation, many organisations favour RPA to improve efficiency, reduce risk and errors, and increase processing time without having to add to their workforce (Lacity, Willcocks, & Craig, 2015b).

The introduction of enterprise resource planning (ERP) tools has allowed companies to govern and manage their businesses, have a central data repository, increase communication and collaboration, and streamline processes (Spathis & Constantinides, 2003). However, their inherent design has also created repetitive tasks that RPA targets to reduce manual interventions and create efficiencies (Hillman Willis & Willis-Brown, 2002).

The rationale behind the adoption of RPA requires an understanding of the evolution of innovation (McKinsey & Company, 2019). A global study by McKinsey & Company in 2020 identified the most common technologies being deployed. These are outlined in Table 2.1 below.

Table 2.1: Most commonly adopted types of RPA solutions

Business need	Technology platform	% Deployed
Business process and case management platforms	RPA	57%
Assisted and unassisted processes	RPA	44%
Image processing	OCR	37%
Machine learning	Analytics	36%
Data gathering	Process mining	32%
Voice and conversational	Chatbots	25%
Natural language processing	Chatbots	16%
Cognitive engines	Chatbots	10%

Source: McKinsey & Company, 2020

The data in Table 2.1 points to automation (RPA) as the most common technology being deployed. This is mainly because: (i) automation drives efficiency; (ii) automation reduces processing costs, allowing less downtime and uninterrupted production; and (iii) automation allows employees to focus their time on value-adding activities rather than repetitive, mundane functions (IBM Watson, 2021).

According to a study conducted in 2019 by MIT Sloan School of Management, there are four levels of automation:

Level 0: Cost-focused automation is used to lower production costs and reduce human labour. This type of automation has been shown to have negative effects on the economy and the company.

Level 1: Performance-driven automation is the augmentation of the process through automation but still requires humans to complete the task.

Level 2: Worker-centred automation is aimed at the development of the individual by creating an environment that fosters collaboration between humans and machines.

Level 3: Socially responsible automation will improve society as a whole by creating new jobs and driving economic growth. To achieve this level of automation, the society concerned requires a clear strategic objective, collaboration, a sense of ownership, and a strong sense of community.

These levels suggest that the higher the goal of automation, the more collaboration between people and technology is required. However, it also indicates that, in some cases, lower levels of automation can be easier to pilot and implement.

Because of the relatively low cost and ease of use, companies regard RPA as an investment, but repetitive processes become potential targets for job losses. It is, therefore, critical that the process of adopting RPA solutions supports both employees and the enterprise.

2.5 WORKING TOGETHER WITH AUTOMATION

Technology has created incremental economic gains for countries and industries that have successfully adopted new ways of working. Automation and digitisation can provide an economic boost. Expected production (compound annual growth rate) is estimated to be 0.7% but with digitisation, it has the potential to grow to 2.1%. Per capita income growth is projected to be 1.1% and with digitisation, it can grow up to 2.4%. Real GDP growth is projected at 2.1% and with digitisation, it can grow up to 3.5% (Stats SA, 2021).

2.5.1 Workers and automation

Commentators agree that automation will impact the workforce (Bhattacharyya, 2021). The number of jobs that are at risk of becoming redundant due to automation ranges from 9%–35% of the working population (Arntz, Gregory, & Zierahn, 2016). This means that, given South Africa's active working population of 14.2 million workers, as many as 4.5 million people are risk of losing their jobs (Mseleku, 2021).

While a closer look at the data suggests that many jobs could be at risk, some key factors work against the adoption of automation. The adoption of automation is slow, especially in developing countries where the focus is on decreasing unemployment levels. Even if new technologies are introduced, employees can switch job tasks and remain employed. Furthermore, technological advancements create jobs in related

markets (Arntz et al., 2016). These factors suggest that actual job losses lean towards the lower end of the estimates.

According to Stats SA (2021), between 2016 and 2030, employment in South Africa will grow naturally from 16.1 million workers to 19.5 million workers. At the same time, it is predicted that about 3.3 million people will lose their jobs as a direct result of digitisation. Although digitisation will displace some existing workers, new technologies will increase production capacity and economic outputs, and create jobs. An estimated 1.8 million jobs will be created because of productivity increases, 1.5 million jobs from infrastructure development, and 1.2 million jobs in occupations. The net effect will be the creation of 1.2 million additional jobs because of new technologies such as automation and digitisation (McKinsey & Company, 2019) .

The type of region in which automation is implemented determines the level of risk. According to a study published by Oxford Economics in 2019, lower-income regions are more at risk of being negatively affected by automation. The study calculated that in lower-income regions, one robot could displace up to 2.2 human jobs, compared to the global average of 1.6. Higher-income regions would likely experience a loss of only 1.3 jobs per robot (Oxford Economics, 2019).

The Economist completed a study in 2018 that calculated several indices relating to the readiness of automation (Table 2.2).

Table 2.2: Global automation readiness index

Index type	South Africa	Global average	SA classification
Automation readiness index	41.0	62.1	Emerging
Innovation environment index	57.8	69.9	Emerging
Education policies	29.2	55.3	Nascent
Labour market policies	31.3	60.4	Emerging

Source: The Economist, 2018

This information indicates that South Africa is not yet ready for automation based on the market readiness, environment, education, and labour indicators. Despite this data, automation is already being introduced in various companies across the country.

The effect of automation cannot be ignored (Oxford Economics, 2019) and companies need to be prepared for the future that automation will provide. The wave of automation is starting in South Africa, where many firms' parent companies are located in the Americas or Europe, and strategic decisions are being made at higher levels to push adoption.

South Africa needs to embrace automation and clarify the principles that will ensure its successful adoption. Understanding the change management activities required at an individual level will support the adoption process and bridge the gap between corporate objectives and employee resistance.

2.5.2 What jobs are most at risk?

Not all jobs are completely automatable but in jobs most geared for automation, such as data processing, e.g. payroll officers and transactional processors, up to 72% of their functions can be automated. Automation will reduce the number of workers in these roles, but it will not be able to eradicate the profession completely (McKinsey & Company, 2019). When considering a fit for automation, the job in question must be analysed in its entirety.

Jobs that are repetitive in nature are most at risk of becoming automated (Oxford Economics, 2019). According to Toshav-Eichner and Bareket-Bojmel (2021), the jobs most at risk of being automated are:

- Authentication services
- Routine service queries
- Updating of basic information
- Capturing of claims
- Processing emails or communications based on basic rules
- Claims processing and settlement
- Identification of fraudulent transactions

The jobs that are most at risk are the low income, low education employment classes (Fleming, 2020). Due South Africa's low education levels, there is a clear misalignment between the jobs that automation will demand and the skills of the working population.

2.5.3 Automation in South Africa

South Africa has clear financial and non-financial barriers to automation, which will prevent automation from completely taking over an industry. Additionally, not all jobs can be completely automated; there are several crucial tasks that machines are not sophisticated enough to complete. At the same time, there are human elements that prevent the adoption of technology (Parschau & Hauge, 2020).

Although smaller companies are less likely to implement automation due to cost and capacity constraints, 65% of small companies reported success in automation compared to 55% in larger companies (McKinsey & Company, 2020).

A key adoption metric is the difference between automation replacing and enabling the workforce. According to Toshav-Eichner and Bareket-Bojmel (2021), 74% of blue-collar workers considered automation a replacement for humans, while only 3% thought of it as an enabler. Among white-collar workers, 53% described automation as a replacement compared to 36% who saw it as an enabler. Fourteen percent of pink-collar workers (nurses and health professionals) saw automation as a replacement, while 51% considered it to be an enabler.

This study focused on white-collar office workers, almost half of whom thought that automation could replace their tasks, but also saw its value in enabling them to be more productive (Allen, 2021).

The future of automation in South Africa lies not in the complete replacement of the worker, but rather in the introduction of technology to improve efficiency, reduce costs, errors, and risk, and improve compliance of processes across businesses. This is the function of change management – to ensure the adoption of technology in a manner that is beneficial to employees and companies alike.

2.6 THE IMPORTANCE OF CHANGE MANAGEMENT

Change management is required to introduce and drive change, especially when considering new technologies, processes and ways of working (Vora, 2013). Change management theory revolves around the following key areas (Indeed, 2021):

- Staff and management alignment: measuring alignment to change and the actions required to manage it

- Tracking success: tracking the success of the change implemented and how the goals are being met
- Culture definition: understanding the cultural requirements for change, language, ethical and social standards, and cultural barriers
- Employee change support: defining the support that employees require to adopt the change
- Process alignment: ensuring that there is technical alignment between the process and the change implemented
- Organisational structure: measuring the impact of the change on the organisation from a structural perspective
- Resistance management: identifying any resistance that workers may encounter or display during the implementation. It refers to resistance revolving around working conditions, training required, and operational process changes
- Roles and responsibilities: redefining the roles and responsibilities of the people involved in the change at an organisational level
- Leadership alignment: tracking the involvement of the leadership team regarding the perceived change
- Project scale: the impact of the change on the organisation from a delivery, client engagement, and operational perspective
- Communications: the communications implemented to socialise the change to be implemented. This aspect looks at communication channels, the impact of the campaign and employees' responses
- Project management: the active management of the delivery of the envisaged change, tracking the project's progress against specified timelines and success metrics.

It is up to the company and the change management team to identify the correct change management methodology to best fit their implementation needs. How a methodology is chosen depends on the type of project, the projected impact of the project, the impact on people, the size of the organisation, the change required, the strategic objectives, the time of implementation, and any other bespoke metric required by the organisation.

An analysis on the effectiveness of the different change management methodologies was beyond the scope of this study. This study focused on the effectiveness of the people change management principles and how they are applied in relation to the successful adoption of RPA initiatives.

An analysis of thirteen change management methodologies yielded the heat map shown in Table 2.3, illustrating the most common focus areas.

Table 2.3: Heat map of aspects of change management methodologies

Change Management Methodology	Staff and Managemnet Alignment	Tracking success	Culture Definition	Employee Change support	Process Alignment	Organisational Structure	Resistance Management	Roles and responsabilities	Leadership Alignment	Project Scale	Project Communication	Project Managemnet
John Kotter's change method	●	●	●			●	●	●	●		●	●
McKinsey 7-S change model	●	●	●	●	●	●		●	●	●		
Kurt Lewin change management model	●	●		●	●	●		●		●		
Prosci 3-phase method	●	●	●			●	●	●			●	
Stephen Covey's model	●	●	●	●		●	●					
Roger's tech adoption curve model	●	●		●	●					●		
ADKAR model (focus on the human element)	●	●					●		●		●	
Prosci change triangle model	●	●	●						●			●
AGS change management method		●					●		●		●	
Nudge theory	●	●	●	●								
Kubler-Ross change curve model	●		●	●								
Bridges transition change management model	●			●	●							
Accelerating implementation method					●			●		●		

The first four areas form the basis of the people side of the change management process. When implementing change management specific to RPA, companies should recognise the potential to drive mass adoption or mass resistance. Individuals will be affected, not only in how they perform and can potentially be replaced, but also regarding their personal worth, sensitivity and competence. From the outset of RPA project implementation, it is crucial that companies understand their employees' emotional state while adapting to and adopting automation.

The next two sections will introduce change management and theoretical frameworks in the adoption of innovation. The change management frameworks include:
(i) change as a social phenomenon, (ii) the cognitive ability to interpret change, (iii) inclusive change, (iv) celebrating change's success, and (v) the proliferation of change. These frameworks will be matched against the areas that are part of the change management methodologies to identify specific activities that will directly impact the change subject. The theoretical adoption of innovation will cover four main user acceptance theories: (i) the theory of reasoned action, (ii) the theory of planned behaviour, (iii) the technology acceptance model, and (iv) the unified theory of technology acceptance.

2.6.1 Change management frameworks

As outlined in the heat map in Table 2.3, most of the change management methodologies focus on the impact that change will have on people. These can be further expanded into the criteria outlined below.

2.6.1.1 Change is a social phenomenon

When considering change in an organisational setting, group dynamics are an important consideration. The adoption of change requires that current work practices be discarded and new ones adopted (Lewin, 1947). This phenomenon is described as “inner resistance to change” – only once employees have accepted the new way of working will the change be accepted.

As more workers begin to accept that change is taking place, this emotion filters across the organisation. Confidence is established and shared within the workforce. Commentators have observed that, at a social or conversational level, employees seem more positive and share their excitement for the approaching change (Piderit, 2000).

Sharing in the communitive benefits arising from the change becomes an important consideration in driving adoption. As the “society” of workers becomes increasingly aware of the constant success, their willingness to adopt change and drive the change agenda increases (Lewin, 1947).

2.6.1.2 Cognitive ability to interpret change

To adopt change, recipients need to have a positive mindset, which must be nurtured and supported by the management team (Choi, 2011). Using media channels to share positive information helps convey messages and expose all employees to the same end goal (Straub, 2009). People need to be exposed to how this change has been successful in the past. It is not enough for the management teams to only communicate the vision of adopting RPA (Appelbaum, Habashy, Malo, & Shafiq, 2012). Sharing success stories will further solidify the implementation of RPA (Schein, 1992). Data supporting similar initiatives allow employees to cognitively accept the change and start embracing new ways of working.

The aim of driving cognitive change is for employees to feel secure in the decision taken by management to adopt automation. There is a clear difference between a

strategic decision to improve the business and an evidence-driven decision with clear success stories.

As part of the cognitive awakening, the organisation must introduce and expand training, rewards, support and decision making across all members of the organisation who will be affected by the change (Schein, 1992).

2.6.1.3 Inclusive change

According to Kotter (1995), change is most successful when the affected individuals are involved in the change process. When considering RPA, the change in question focuses on process redesign to create incremental business efficiency. Involving teams in the process design will empower employees, encouraging them to revisit the existing processes. At the same time, it allows them to see first-hand how the process can be improved or extended to other parts of the business.

Empowering teams' individual members to become agents of change instils in them a sense of ownership, prompting them to drive the success of the change. Training plays a significant role in empowering employees, teaching them the technical requirements for change and explaining how the changes will impact on the business. The training element also allows employees to explore where their skills fit in. It opens the door to the possibility of change and smoothens the transition to adopt, in this case, automation (Kotter, 1995).

By assigning internal change agents, the benefits of change will be longer-lasting (Appelbaum et al., 2012). Not only will the affected individuals become owners, but they will also have gained the necessary experience to adopt change which, in turn, can be shared in the lives of others at both a personal and professional level.

2.6.1.4 Celebrating change's success

When change is driven positively and benefits are derived, it should be celebrated. People are drawn to success stories – even if seemingly insignificant to start, as the change leads to more successes, it becomes clearer that success is possible, yielding personal affirmation and sometimes physical rewards.

The celebration of success also creates a robust communication structure that further reinforces the company's culture regarding change and building success (Holt,

Armenakis, Feild, & Harris, 2007). The message of successful change can be extended to the belief that anything is possible. When interpersonal lessons from successful teams are shared, the company can learn about change from within, rather than waiting for its introduction externally (Rogers, 2003).

2.6.1.5 Proliferation of change

When diffusion practices are implemented, they should not limit or contain change to one area of the business. For a change management culture to be adopted throughout the company, everyone must be engaged in the process of change (Kotter, 1995).

When change is considered part of an organisation's culture, employees accept that their environment is in a constant state of change, to the point that it becomes the natural state. The message that must be conveyed throughout the change process is the belief that change is for the better, with proven internal and external examples.

As change progresses, it is introduced into other parts of the business, whether through automation or other means. The positive outcome of the change is what is seen by the organisation. As the change process evolves, the company can create a central repository for the tools that activated and sustained the change. These can be recreated to fit the organisation's specific requirements (Straub, 2009).

Proliferation of change is the practice whereby an initial change cascades across several business units, improving performance in different areas while creating the sense that change is good and that anything is possible. Table 2.4 was created from the different change management methodology activities and the associated change management frameworks, which were designed to provide benefits that can be derived from the correct implementation of change management. Table 2.4 presents activities that will serve to improve the adoption of change as implemented using a change management methodology while managing an RPA project.

Table 2.4: Change methodology and change management frameworks

Change methodology		Staff and management alignment	Tracking success	Culture definition	Employee change support
Change management frameworks	Change is a social phenomenon	• Sharing data and strategic reasoning	• Sharing success stories	• Defines a culture of change	• The organisation supports the change
	Cognitive ability to interpret change	• Allows everyone to be exposed to the impact of the change		• Creates a culture of positivity • Engenders feelings of security and confidence	• Allows employees to see change as a good thing
	Inclusive change	• Creates ownership and willingness to change	• The positive effects of the change can be seen across different areas of the organisation	• Drives change initiatives in personal and professional settings • Creates a culture of long-lasting change	• Training and empowerment • Skills development • Process knowledge
	Celebrating change success	• Success is recognised and rewarded	• Change is referred to and appreciated	• Working towards a culture that embraces change	• Individuals are introduced to change and are allowed to experiment on what change means for them
	Proliferation of change	• Everyone is impacted by the process of change	• The reach of change is felt across the organisation	• Change becomes part of how business is done	• A change arsenal is created with the necessary tools to drive change from an individual perspective

2.6.2 User acceptance theories

The four theories listed below form the basis for driving the adoption of innovation at a personal level. The focus is on individual behaviour management and the prediction of personal intention.

2.6.2.1 Theory of reasoned action

The theory of reasoned action (TRA) was developed by Ajzen and Fishbein in 1975 and is centred around individuals' ability to gather available data and create an informed option of the actions that will be taken (Ajzen & Fishbein, 1975). The theory was founded on an individual's intention to accept change. The individual's intention to react is based on their evaluation of engaging in the activity and the consequences of failing to complete the activity based on the resources available. In the case of change management, the individual's decision is based on the benefits that RPA will bring to their existing role and the loss of productivity should the automation not be adopted. The TRA accepts that there are external variables influencing the acceptance level (Davis, Bagozzi, & Warshaw, 1989). The variables are considered part of the change management approach that will give individuals the necessary information and support to accept the change.

2.6.2.2 Theory of planned behaviour

With the TRA, the subject is limited by the available resources. Should the individual want to extend their reach by improving their position, the TRA can cater for this internal desire to accept change (Madden, Ellen, & Ajzen, 1992). The theory of planned behaviour (TPB) adds to the dimension of the desire to grow and extends beyond the factors and data that are made available to the individual. The TPB considers how the person would personally benefit from the change. This is important when considering the impact that RPA will have on the working population. As previously discussed, lower-income groups will be more affected by automation. Given that incentives are provided to motivate the adoption of change, the individual's desire must be identified and nurtured to drive the change. The more the individual is willing to accept the change, the more successful the change will be.

2.6.2.3 Technology acceptance model

The technology acceptance model (TAM) has gone through various iterations and expansions since it was first introduced by Davis in 1986. In its latest revision by Venkatesh and Davis in 2000, the model focuses on user acceptance of technology based on two factors: perceived usefulness, and intention to use (Venkatesh & Davis, 2000). The models cater for external variables that influence the individual to form an opinion of the perceived usefulness and ease of use of the technology. These two variables form the behavioural intention for actual adoption. In the case of RPA, the individual will have to filter through all the data available and ensure that two critical questions are answered: (i) Is RPA useful to me? and (ii) Do I want to use it? Change agents should therefore focus their efforts on providing factual, unbiased information on the usability and long-term benefits that the individual and the company will realise from the use of automation.

2.6.2.4 The unified theory of acceptance and use of technology

The unified theory of acceptance and use of technology (UTAUT) was created in 2003 by Venkatesh, Morris, Davis and Davis and is a combination of several user acceptance theories including TRA, TPB and TAM. The UTAUT introduced (i) performance expectancy, (ii) facilitating conditions, (iii) social influence, and (iv) effort expectancy. It included age, gender, experience and voluntariness as additional variables that influence the adoption rate (Venkatesh, Morris, Davis, & Davis, 2003, as cited by Tew, 2019). Although performance and effort expectancy are described in the TAM, facilitating conditions are situations in which technology adoption is made easier. Social influence refers to how the individual is perceived in a social setting, irrespective of whether the change was adopted or rejected. The additional variables of age, gender, experience, and voluntariness are added to create a more complete view of the individual. However, the author believes that in 2022 these variables impact the decision of adoption to a far lesser degree than when the study was formed. The UTAUT is helpful in that it assists change managers in forming an employee profile when presenting change. This is particularly helpful when dealing with large teams from similar cultural backgrounds, social status and economic position as it will help in grouping factors that matter to the group and so facilitate the adoption of change.

2.6.3 Relevance to the study

The change management framework formed the basis of this study. It aimed to ensure that individuals who are expected to embrace change are coached and not coerced into adopting RPA. Employees are made up of different individuals; it us up to the change manager to identify the fabric that binds them all and to create a change management plan that: (i) is open and honest and provides information; (ii) creates an atmosphere that nurtures growth and inclusiveness; and (iii) ensures growth through the adoption of risk assessment programme technology. The principles highlighted in this section will be revisited when the change management plan is presented as the outcome of this study.

2.7 WHAT IS IMPORTANT TO THE SOUTH AFRICAN WORKER?

Knowing what is important to the South African worker will determine how to best manage the change that automation will bring.

The South African social attitudes survey, conducted by the Human Sciences Research Council (HSRC), charts and explains the interaction between the country's changing institutions, its political and economic structures, and the attitudes, beliefs and behaviour patterns of its diverse populations. Table 2.5 lists the elements that are important to the South African worker.

Table 2.5: Work criteria that are most important to the South African worker

Work attribute	% of workers who view the work attribute as being important	% of workers who believe their job characterises the work attribute
1. Job security	99	65
2. Good opportunities for advancement	94	38
3. Interesting job	93	65
4. High income	92	28
5. The job allows workers to help others	88	69
6. The job is useful to society	84	68
7. The job allows workers to work independently	81	59
8. Flexible working times	66	*not included in characteristics*

Source: HSRC South African social attitudes survey 2005, as cited by Mncwango and Winnaar (2009)

2.8 CONCLUSION

This chapter reviewed the academic and practical literature relating to the research problem. The importance of a change management methodology for the implementation of RPA projects for the South African worker was investigated. Given how innovation in RPA has developed over time, the implications of introducing technology that will replace non-value adding functions are clear. Not only are companies looking to reduce costs and create efficiencies, but workers are looking for assistance in augmenting their functions.

Because automation cannot replace all jobs, workers need to view automation, not so much as a threat, but as a tool that will help them deliver more value to companies and their communities.

The value of following a change management approach to drive change within organisations has clear benefits. Change management has evolved as a practice that tackles a wide range of employee and employer topics, including delivery, training, support, preparation and leadership. As a methodology, change management can be designed to incorporate cultural requirements that will drive the adoption of change. Although there is no specific change management framework for the South African employee, the principles that make up the different change management methodologies can be combined to form a suitable strategy for the South African worker.

The South African worker has specific requirements for achieving job satisfaction. The research approach employed in this study aimed to identify which of these requirements were being met while RPA was being implemented across several industries. Based on the literature review and the study's outcome, the researcher aimed to gather sufficient information to design a comprehensive methodology to manage change at an individual level for the adoption of RPA in the workplace.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the research design, approach and methodology used to answer the research problem and objectives. The sections that follow explore the research method, tools, population and sampling, data validity and reliability, general considerations, ethical considerations and limitations encountered during data capture and sampling.

3.2 RESEARCH DESIGN AND APPROACH

The research applied an inductive research methodology, gathering data from a survey questionnaire aimed at answering the research problem. The researcher took a theoretical approach to the data analysis to determine the correlation between successful change management practices and the outcome of the automation project.

Causality was investigated using a research approach that pointed to the primary relationship variables by defining which combination made the automation project successful. The research aimed to answer the problem statement as unambiguously as possible given the data available (de Vaus, 2001).

As automation technology changes rapidly, this study employed a cross-sectional research design. It had to accommodate the possibility that the company would need to review the change management methodology the study aimed to design in the months following the release of this document (Olsen & St. George, 2004). The research aimed to identify the change management principles determining the success of an automation project. These principles were compared to successful change management theories and South African worker concerns. They were used to build a set of activities outlining the components of a successful change management approach to an automation project.

According to Creswell (2014), the research approach entails the planning and procedural steps taken to gather data and analyse and interpret the results. The research variables are the characteristics, properties, or attributes of the research objectives (Leedy & Ormrod, 2010). In this study, the independent variables were: (i) the change management activities conducted, (ii) the impact of the change management activities, and (iii) the outcome of the automation project.

Given the author's experience of the subject, quantitative analysis was chosen as the preferred method of data collection for the following reasons:

- Measurement of the variables was better captured through a quantitative data collection approach rather than exploring qualitative characteristics. As a large sample was required to obtain a statistically significant measure, a numerical approach was considered best suited to deduce the impact and statistical significance of the variables (Saunders, Lewis, & Thornhill, 2009).
- The study required a descriptive data analysis approach; numerical data is better suited for statistical comparisons and causal analysis than qualitative analysis (Maree, 2019).
- The study was based on the objective analysis of the independent variables; in using a quantitative approach, the researcher's post-positivist view would help in measuring the data and forming unbiased results (Creswell, 2014).

Both categorical data for categorising and ranking and numerical data for measuring were used as the quantitative data inputs to address the research objectives.

3.3 RESEARCH METHOD

Leedy and Ormrod (2010) defined the research method as the processes or techniques used in collecting data from the target sample. A descriptive survey is a method of gathering information from a group of individuals about their experiences, opinions, characteristics, or attitudes by asking questions and categorising their responses (Leedy & Ormrod, 2010).

The descriptive method employed in this research was aimed at understanding the target sample's knowledge and experience of the change management activities followed during the implementation of automation projects.

3.4 RESEARCH TOOL

The survey was developed using Microsoft Forms and emailed to the sample participants. The questionnaire comprised 15 closed-ended questions that would be used to define statistically significant metrics when conducting the data analysis (Leedy & Ormrod, 2010).

The 15 multiple choice questions allowed the participants to select between one or more pre-set options (Maree, 2019). Closed-ended questions are easy to code and review, but have some disadvantages (Bell, 2005):

- The selection of answers might not include a scenario specific to the respondent.
- The respondent cannot expand on their response, thus qualifying their response as binary.
- The selection might prompt the respondent to select an option they had not previously considered.
- The respondent can answer a question based on the options available, even without understanding the question or having knowledge of the topic.

The questions were aimed at listing, ranking and categorising the responses, and were categorised as follows:

- Change management activities
- Robotic process automation (RPA) implementation success
- RPA project objectives
- Employee support
- Employment impact.

The questionnaire was distributed to a predetermined list of participants who had knowledge of RPA projects. The participants, who were identified as individuals who actively participated in the delivery of RPA initiatives, were contacted directly from a list of companies that had implemented RPA projects.

Unlike an open questionnaire covering a wide population that does not yield significant data, some advantages of using an online questionnaire aimed at a specific group of individuals are:

- An electronic questionnaire is cheap and easy to deliver to the target group (Survio, 2013).
- The respondents can respond at their convenience without the researcher's intervention, thus reducing any bias that may have occurred if the interview were conducted face to face (Survio, 2013).
- The respondents can reply simultaneously, allowing the researcher to collect large amounts of data over a short period (Sincero, 2012).

- Statistical analysis of the responses can be performed more easily (Survio, 2013).

However, online questionnaires can also represent some limitations:

- Misinterpretation can occur since the respondents are not able to clarify questions and scenarios (Survio, 2013).
- The closed-ended questions can prevent the researcher from gaining additional knowledge as there is no possibility of probing deeper into individual responses (Sincero, 2012).

The questionnaire was presented in English only. It went through several rounds of testing to ensure that the questions were clear and direct, and the answers covered the envisaged outcomes. The copy of the questionnaire, email request and permission letter can be found in Appendix A.

3.5 RESEARCH POPULATION

The target population is the entire population that can provide information to answer the research topic (Winifred S. Hayes Inc, 2011, as cited by Law, 2015). It is estimated that 500 companies in South Africa have implemented RPA initiatives (UiPath, 2022). For this research, the target population comprised managers across several South African companies who had been involved in RPA projects.

The questionnaire was sent directly to the individuals who qualified to participate. Candidates' names were gathered from LinkedIn Research, in collaboration with RPA vendors, and from the researcher's own contact list and market experience.

3.6 SAMPLING

A sample is defined as a statistically significant portion of the population that accurately represents the population. Based on the Cochran method of sample estimation, the researcher decided that the statistically significant results could be obtained from a sample of 88 participants.

$$n = \frac{Z^2_{\alpha|2}\rho(1-p)}{e^2}$$

The variables used were a positive proportion response (ρ) of 30%, a margin of error of 0.01 and a Z (α) of 0.1.

For an analysis to render statistically significant results, the sample needs to resemble the population. Given the lack of information available on direct RPA projects, the sample was derived partly from market inference, but also collaboration from RPA partners and the author's experience. According to McKinsey & Company (2020), larger companies (with $1 billion or more in annual revenues) are prioritising RPA. In addition, the top 100 Johannesburg Stock Exchange (JSE) listed companies are pioneering RPA in some way.

The sample size was created using non-probability random sampling. Although the questionnaire needed to be answered by individuals who were directly involved in RPA projects, simple random sampling was used, and the questionnaire was sent to multiple participants who met the experience and seniority criteria.

Given the variety of organisations involved with RPA, there was no one common role across all companies. Depending on the area in which the RPA project was being implemented, responsibility for implementation rested with people holding different positions. The most common profiles for people who would be able to accurately answer the questionnaire were:

- Executives and senior management, who could explain the strategic intent of the project and the risks associated with the approach taken. In most cases, this group would be the project sponsor.
- Operational managers, who were directly impacted by the automation project. They would have been able to identify how the project was executed, its impact on staff and leadership's involvement throughout the project.
- Change managers, who were directly responsible for implementing the change portion of the RPA project. In many cases, the change manager reported to the project management office or the project sponsor.
- IT managers, who would have overseen the overall success of the project and would have been directly involved with the architecture, implementation, and success measures.

The study's outcome was contingent on the successful implementation of RPA projects. Despite the number of direct contacts gathered for completion of the questionnaire, the researcher understood that not everyone who was contacted

would respond in time. Table 3.1 illustrates the sample population distribution.

Table 3.1: Distribution of sample population

Interviewee Profile ➔ Industry ⬇	Executives and senior management	Operational managers	Change managers	IT managers
Advertising	3	4	2	5
Manufacturing	2	5	4	4
Banking and finance	3	7	5	6
Logistics and warehousing	3	5	5	9
Healthcare	4	8	4	8
Energy	2	5	2	5
Consulting	3	4	5	6
Total	**20**	**38**	**27**	**43**

3.7 DATA ANALYSIS

Inferential and descriptive statistics were applied to the data to investigate the relationship patterns required to support the research (Leedy & Ormrod, 2010). Descriptive statistics were used to understand the data based on patterns, structures, and volumes (Maree, 2019). Inferential statistics were applied to understand relationships within the data, especially when using a significant sample, and extrapolating those observations to the population (Leedy & Ormrod, 2010). The following statistical analyses were applied:

Points of central tendency: The mean, median, and mode were used, where the mean is the mathematical average, the median is the central point across the data set, and the mode is the most frequently observed value (Leedy & Ormrod, 2010).

Measure and variability: This is characterised by the standard deviation which was used to measure the variability of the observed data points around the mean.

Shape of distribution: This is the measure of symmetrical deviation from a normal distribution. There are two main measures, skewness and kurtosis.

According to Bulmer (1979), skewness measures the graphical representation of the points and how they would differ from a normal distribution:

- Skewness > 0 is a right-skewed distribution with most values concentrated to the left of the mean, and extreme values to the right.
- Skewness < 0 is a left-skewed distribution with most values concentrated to the right of the mean, and extreme values to the left.
- Skewness $= 0$ is a distribution that is symmetrical around the mean.

Kurtosis measures how peaked or flat the data points are (DeCarlo, 1997):

- Kurtosis > 3 represents a leptokurtic distribution with a sharper than normal distribution and thicker tails, indicating a higher concentration of values around the mean.
- Kurtosis < 3 represents a platykurtic distribution with a flatter than normal distribution and thinner tails, indicating a wider spread of values around the mean.
- Kurtosis $= 3$ represents a mesokurtic distribution with a normal distribution.

Measure of internal consistency: Cronbach's alpha coefficient was used to test the reliability of the questionnaire. Values greater than 0.7 were considered tolerable, whereas values below 0.5 were considered statistically intolerable (George & Mallery, 2003).

Table 3.2: Cronbach's alpha coefficient range

Cronbach's alpha	Reliability
>0.90	Excellent
0.80 – 0.89	Good
0.70 – 0.79	Acceptable
0.60 – 0.69	Questionable
<0.50	Poor

Source: Adapted from SPSS for Windows step by step: A simple guide and reference (George & Mallery, 2003).

Measure of difference: One-way analysis of variance (ANOVA) was used to find statistically significant differences between the means of two or more independent

groups. In cases where two groups were compared and found to be statistically different, further analysis had to be conducted at a 95% confidence level.

This research used the ANOVA single factor test which is the method used when comparing a data set with one independent variable, and the data presented is uniform. The primary variable in this research was the RPA project's success compared to the outcome of the different questions.

When conducting hypothesis testing, the p-value is still considered, where a p-value of less than 0.05 will result in the rejection of the null hypothesis.

Measure of association: The Pearson product-moment correlation (*r*) coefficient was used to measure the level of linear correlation between two sets of data. An interpretation used by Nangolo and Musingwini (2011) yielded the following guideline:

- 0.01 to 0.10 or –0.01 to –0.10: no or very weak positive or negative (–) relationship
- 0.11 to 0.30 or –0.11 to –0.30: weak positive or negative (–) relationship
- 0.31 to 0.50 or –0.31 to –0.50: moderate positive or (–) negative relationship
- 0.51 to 0.80 or –0.51 to –0.80: strong positive or (–) negative relationship
- 0.81 to 1.0 or –081 to –1.0: very strong positive or negative (–) relationship

3.8 VALIDITY AND DEPENDABILITY

Validity of a questionnaire refers to the extent to which a questionnaire measures what it is intended to measure (Maree, 2019). The external validity of the study was found to be reliable in that the conclusions drawn from the study can applied to other scenarios (Leedy & Ormrod, 2010). Both points reflect the sample characteristics; should the sample not be statistically significant, it would be irresponsible for any findings to be generalised and any meaningful and applicable conclusions to be shared privately and publicly.

Dependability of a study refers to how accurately the results can be replicated should the questionnaire be resent to the participants at a different date. Due to time constraints, the questionnaire was sent only once. However, inter-item correlations were tested to determine internal consistency, using Cronbach's alpha coefficient (Maree, 2019).

3.9 ETHICAL CONSIDERATIONS

The research was driven by an interview process with the identified individuals, while taking into consideration the following ethical considerations according to the Regenesys Ethics Committee code of conduct:

- Informed consent
- Deception
- Right to privacy
- Disclosure and findings
- Confidentiality
- Code of ethics
- Cultural sensitivity

Only the correlation between successful change management practices and the outcome of RPA were considered for this study. The study focused on practices associated with a change management approach and its impact on the adoption of automation projects. Individuals' personal views, opinions, and grievances did not form part of the analysis.

The study did not need to collect any private or personal information. The names of the companies, people and associated third parties have been omitted from all results.

3.10 POTENTIAL LIMITATIONS OF THE STUDY

It is the responsibility of the researcher to ensure reliability and try to eliminate any bias from the study. In any data gathering exercise, unless the sample is open to the public, the possibility for bias exists. Any bias introduced can skew and distort the data (Leedy & Ormrod, 2010). This research was based on: (i) gathering information from individuals who had participated in RPA implementation, and (ii) analysing the data and developing a successful change management plan that can be used to facilitate the implementation of future RPA projects in South Africa.

The individuals' contacts came from RPA vendors, LinkedIn, and the author's own contact list. The identity of all participants was concealed during the analysis phase. As the questionnaire was digital, and the responses were collated into an MS Excel database created by MS Forms, there was no way of matching the responses to any

individual. Complete anonymity and confidentially was maintained throughout the process – names, companies and contact information were not requested and were not captured in any way.

Participants' honesty was based on their willingness to participate. The author is eager to share the outcome with everyone in the hopes that when RPA projects are implemented in future, the change management guidelines are considered. Had the participants been dishonest or hidden their experiences, there would have been little that the researcher could do other than look for inconsistencies in the data. In the case of statistically significant contradictions, the researcher could potentially remove those entries.

The data from online questionnaires is less reliable than in-person interviews. However, given the time and cost constraints, an electronic questionnaire was considered the most accurate way to gather the information. Although responses to multiple choice questions lack the detail that open-ended questions can provide, the aim was to narrow the responses to key change management and implementation challenges while remaining as independent and unbiased as possible.

3.11 CONCLUSION

This chapter described the research design, research approach, and research methodology that this study followed. Inductive research and a cross-sectional design were considered best for gathering the data required to answer the research problem. A quantitative approach was chosen, and statistical analysis used to infer meaningful results from the data. Using MS Forms to survey a sample population, the questionnaires were sent directly to the sample of individuals identified. The study's target population included executives, operational managers, change managers and IT managers who had been involved in the implementation of RPA projects. Non-probability sampling was applied to secure a sample of a minimum of 88 respondents representing companies in South Africa that have implemented RPA projects. Descriptive and inferential statistical techniques were applied to analyse the data using Excel and statistical package add-ons.

The validity of the questionnaire was examined to ensure that the required data was available and that the results could be aligned to the target population. Internal

consistency and reliability of the questionnaire were tested by measuring inter-item correlations using Cronbach's alpha coefficient. Research ethics were reviewed to protect the rights and privacy of the research participants. Finally, potential limitations of the study were discussed with reference to the risk of sampling bias, and steps were taken to ensure that the data was as statistically significant as possible.

CHAPTER 4: RESEARCH RESULTS

4.1 INTRODUCTION

This chapter presents the results from the survey questionnaire, which aimed to understand the change management criteria implemented for robotic process automation (RPA) projects. Each section of the questionnaire represented change management principles and criteria that were important to workers. The questionnaire was sent via email to the 128 potential respondents using MS Forms. A minimum of 84 responses was required for a valid sample and candidates had 30 days to respond. By the end of the 30 days, 103 responses had been received, exceeding the minimum sample requirements.

The research results are divided into eight sections:

- Section 4.2 analyses the response distribution based on the project outcome to determine whether the distribution of the sample size was statistically significant and would yield accurate results.
- Section 4.3 measures RPA project metrics correlating the responses to the project outcome. The aim of this section is to determine the project criteria that characterise a project outcome.
- Section 4.4 examines employee involvement in the project outcome. This metric determines the role of employees' contributions in the project outcome.
- Section 4.5 focuses on the impact of RPA on job factors, specifically how the project outcome was positioned to influence job continuity for employees.
- Section 4.6 looks at RPA benefits outside of the organisation, and how the project outcome correlates to the benefit to society and the organisation alike.
- Section 4.7 measures the impact of the RPA project's individual productivity against its success.
- Section 4.8 analyses the change management areas that were considered successful versus those that needed more input against the outcome of the RPA project.
- Section 4.9 looks at automation readiness against the project outcome, with the aim of determining how the success or failure of the project positions future RPA implementations.

4.2 RESPONSE DISTRIBUTION

The sample was measured by response class. It had to be further classified and weighted by the strength of response provided. The outcome could be compared to a Likert scale, measuring response strength as summarised in Table 4.1.

Table 4.1: Would you consider the project a success?

Response	Likert measure	Outcome
The project met all our expectations	5	Successful
The project met some of our expectations	4	Successful
The project did not meet our expectations as some processes cannot be automated at this stage	3	Unknown
The process is still highly dependent on human intervention	2	Failure
The project failed	1	Failure

Of the 103 responses gathered, the outcome of the RPA project was successful for 51, while 31 were classified as failed projects and the outcome was unknown for 21 (Figure 4.1).

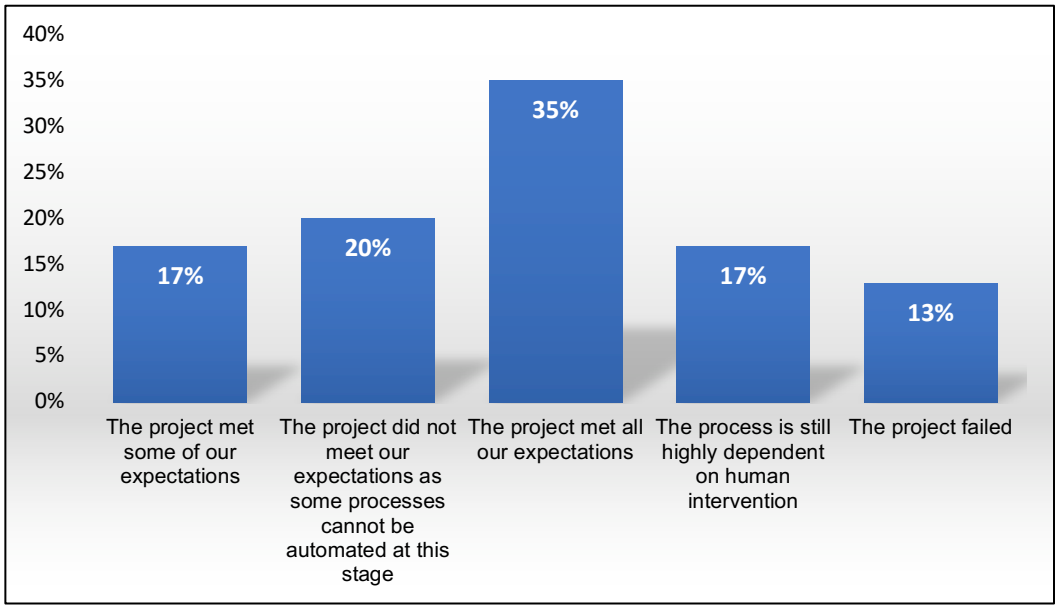


Figure 4.1: Project outcome distribution

The distribution of the sample observed approximates that of a statistically significant sample size. The skewness of the sample was measured at 0.081, which depicts the data centring around the mean. The kurtosis measured 2.85 – characteristic of a mesokurtic distribution that approximates a normal distribution. The confidence level measured 0.047, which indicates that the results approximate a statistically significant sample.

The above metrics of the project outcome distribution provided the necessary confidence to proceed with the output analysis of the remaining questions.

4.3 AUTOMATION PROJECT METRICS

The project outcome is the metric used to correlate the change management principles for delivering on the solution. This section explores the intention of the project, areas of difficulty, and the change management principles used.

4.3.1 Aim of the project

The aim of the project defines its intention, which determines the driving factors of success. The five aims provided were: (i) process efficiency, (ii) reduction in human dependency, (iii) reduced operational risk, (iv) increased compliance, and (v) cost cutting. When identifying the aim of the project, participants were asked to provide more than one answer. The responses were added per outcome category and depicted as a total count of replies (Table 4.2).

Table 4.2: What was the aim of the project?

Response	Success	Failure	Uncertain
Process efficiency	31%	12%	14%
Reduced operational risks	26%	9%	18%
Cost cutting	10%	41%	23%
Reduced human dependency	16%	35%	25%
Increased compliance	18%	3%	20%

In the case of successful RPA implementations, process efficiency (31%) and reduction of operational risks (26%) ranked as the most important aims for the introduction of RPA (Figure 4.2).

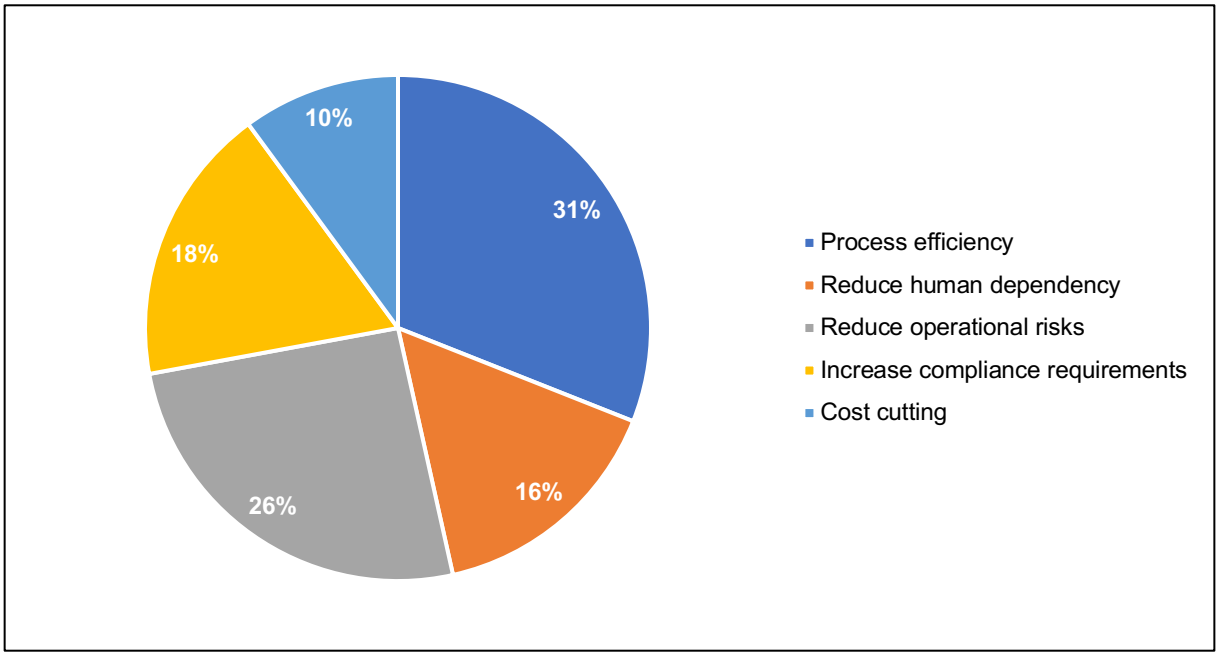


Figure 4.2: Project aims for successful RPA implementation

In the case of failed RPA implementations, the aims that ranked the highest were cost cutting (41%) and reduction of human dependency (35%) (Figure 4.3).

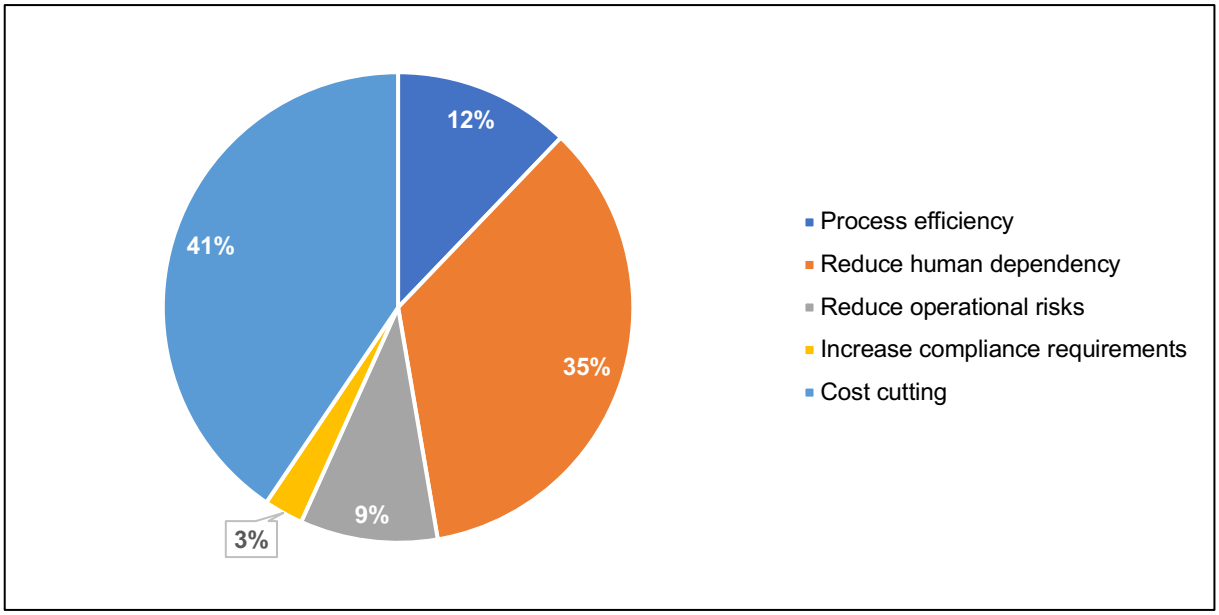


Figure 4.3: Project aims for failed RPA implementations

For RPA projects where the outcome was uncertain, there was a fairly even spread across the responses provided (Figure 4.4).

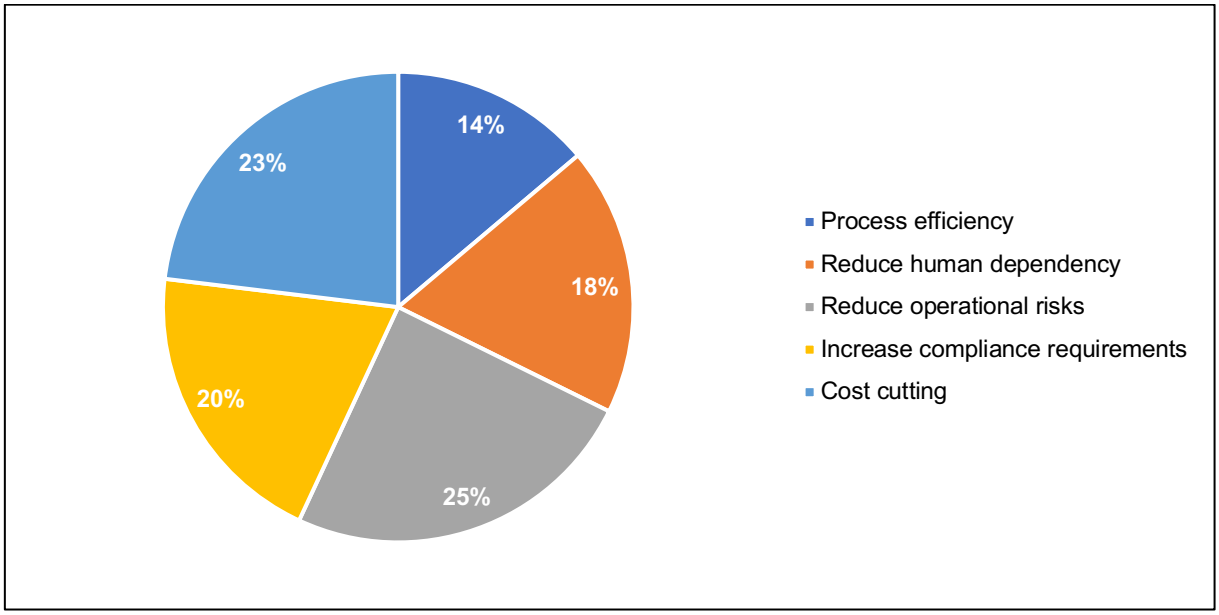


Figure 4.4: Project aims for uncertain automation outcomes

4.3.2 Areas that presented the most difficulty

This question was aimed at understanding how the change management approach should be tailored to address the challenges identified under the areas that presented the biggest challenges during implementation. Table 4.3 provides an overview of the responses for each project category.

Table 4.3: Which areas presented the biggest challenge?

Response	Success	Failure	Uncertain
Process mapping and development	9%	5%	13%
Technology platform	40%	6%	7%
Third party system integration	38%	4%	4%
Adoption of automation	7%	41%	37%
Internal barriers	6%	43%	39%

The respondents were asked to list the all the areas that presented a challenge. Figure 4.5 illustrates the responses per outcome. For successful RPA implementations, the biggest challenges were technology platforms (44%) and third-party system integration (42%) as a percentage of the responses collected. For failed RPA implementations, internal barriers (40%) and adoption of automation (39%) were the most frequent responses.

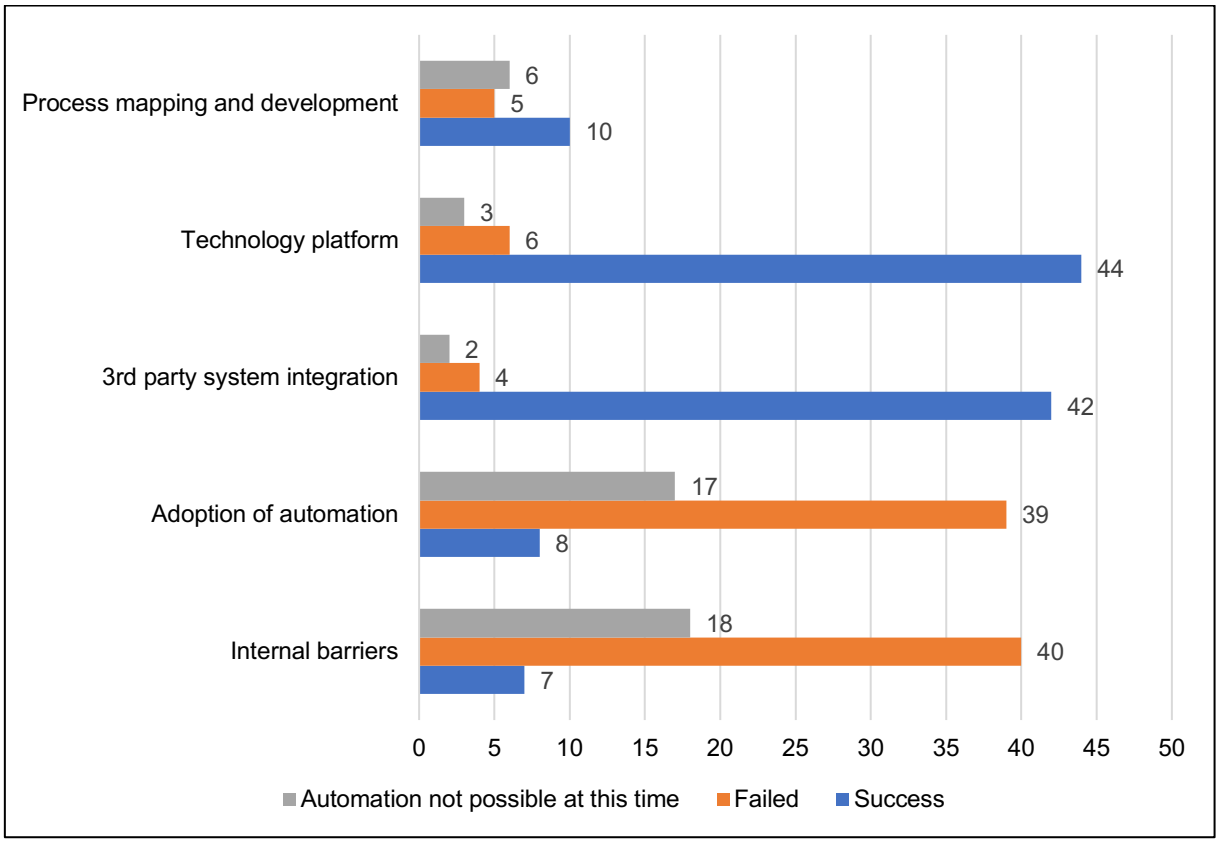


Figure 4.5: Project areas that presented the biggest challenge

4.3.3 Change management approach

The change management approach shows, in the case of successful and failed RPA projects, the key focus areas of the implementation team. The options presented in this case were: (i) success was tracked based on processing volumes and reduction of human intervention, (ii) management was involved and worked with the teams throughout the deployment to ensure adoption, (iii) a clear vision and end state were shared with the employees, (iv) the affected individuals were trained throughout the process, and (v) staff and management worked together to develop the solution. The respondents were asked to select the areas they observed were considered during the RPA implementation project. Table 4.4 provides an overview of their responses.

Table 4.4: What change management approach was used?

Response	Success	Failure	Uncertain
Success was tracked based on processing volumes and reduction of human intervention	12%	65%	14%
Management was involved and worked with the teams throughout the deployment to ensure adoption	6%	13%	19%
A clear vision and end state were shared with the employees	31%	6%	28%
The affected individuals were trained throughout the process	8%	7%	30%
Staff and management worked together to develop the solution	42%	9%	9%

The responses were recorded based on frequency per type of outcome. For failed RPA implementations, there were 35 instances where respondents cited that the change management approach focused on tracking the reduction of human intervention. Successful RPA implementations reported that the change management approach was more focused on staff and management alignment to develop the solution (41) and setting a clear end-state vision with employees (30) (Figure 4.6).

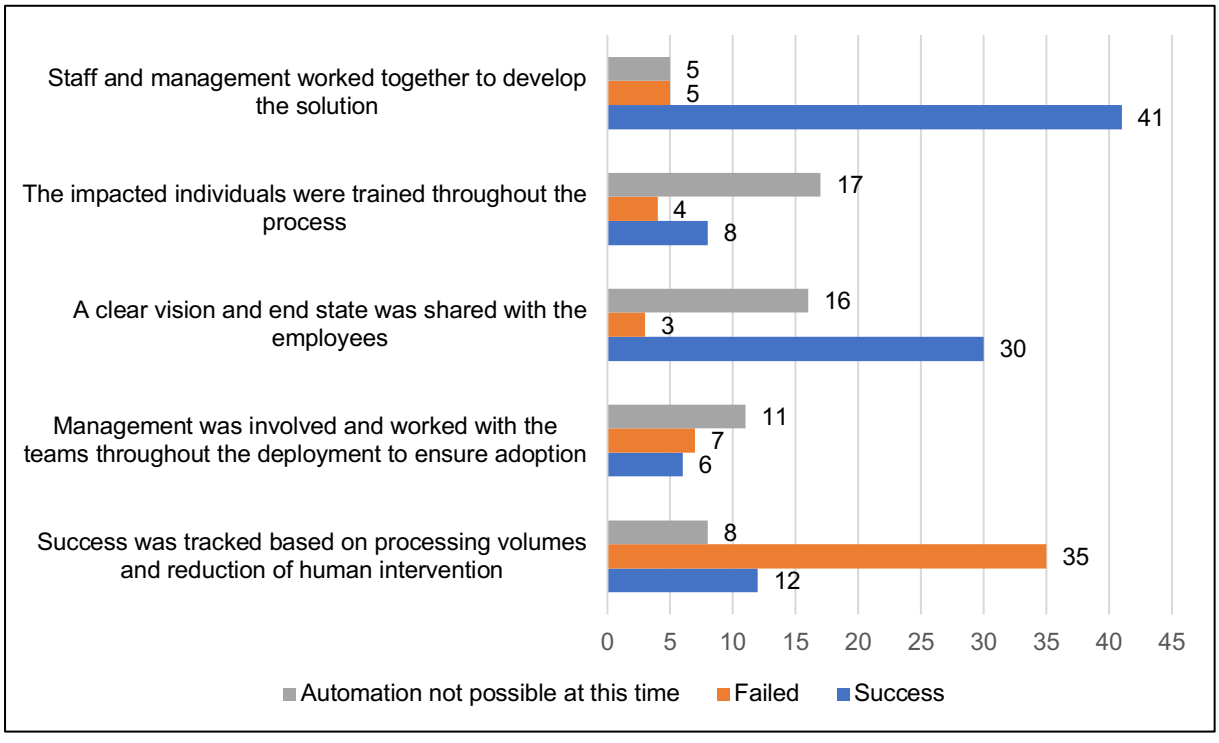


Figure 4.6: Change management approach used

4.4 EMPLOYEE INVOLVEMENT

The employee involvement section of the questionnaire identified four main areas: (i) the type of support provided from RPA implementation, (ii) how the training was conducted, (iii) how employees were prepared for change, and (iv) the type of training provided.

Unlike the previous questions, where the respondents had an opportunity to select more than one outcome, this section limited the response to one selection. Further statistical analysis was based on the measure of association using the Pearson product-moment and one-way analysis of variance (ANOVA) to test for significant differences, and the measure of the questionnaire's internal consistency was performed on the data.

4.4.1 Support provided during RPA implementation

Support provided during implementation was aligned to communication and the presence of the management team during implementation. The data was analysed against the project outcome as outlined in Table 4.5 and illustrated in Figure 4.7.

Table 4.5: What type of support was provided during RPA implementation?

Response	Success	Failure	Uncertain
The change management team was active in providing support and communicating the end state	78%	0%	24%
The teams felt lost and often asked for guidance	0%	81%	14%
The teams required more support than was provided	10%	13%	10%
There was a dedicated change management team but it was up to the employees to seek support	2%	6%	48%
Yes, adequate support was provided throughout the process	10%	0%	5%

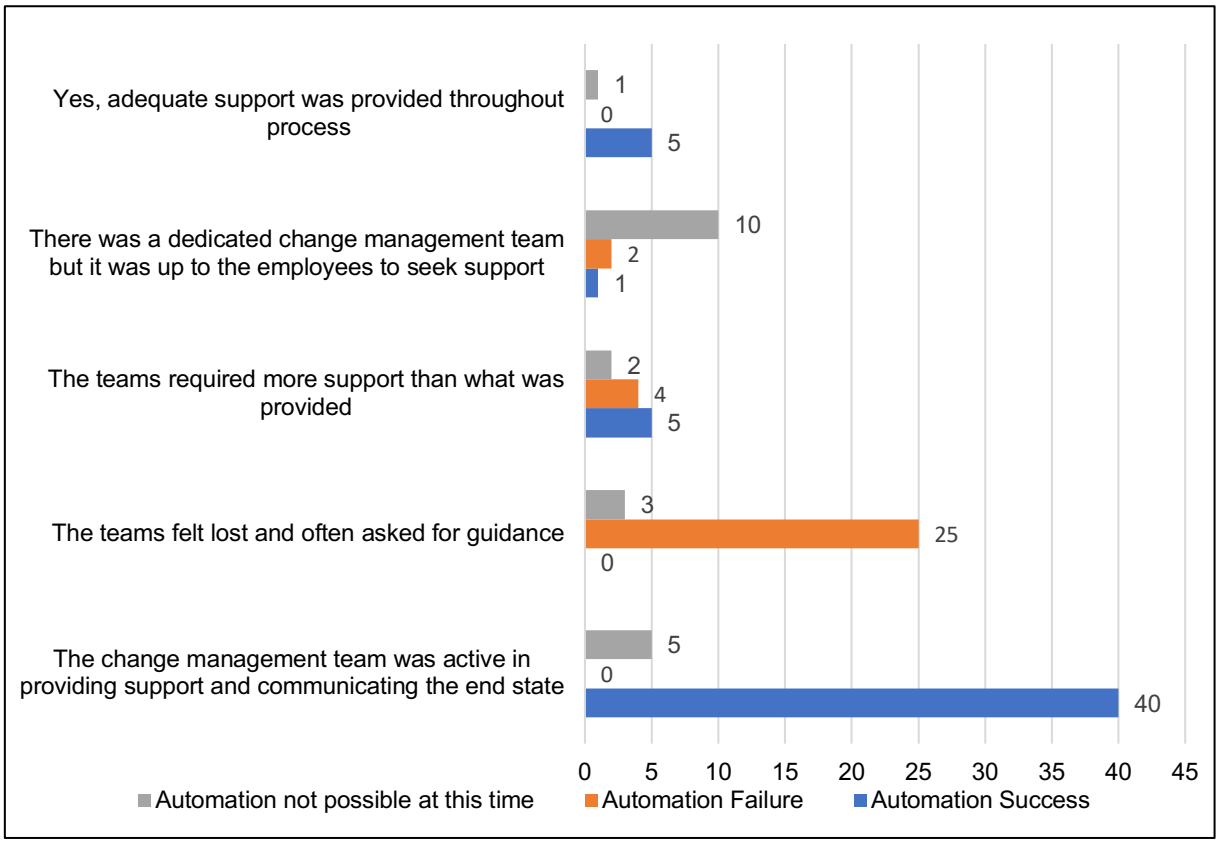


Figure 4.7: Support provided during RPA implementation

The statistical results showed a Pearson's correlation coefficient of 0.76, suggesting a strong relationship between the success of the project outcome and the support provided. The ANOVA measure of statistical significance was calculated at $\rho = 0.01$, lower than 0.05 (95%), resulting in significant measures of the sample size. Cronbach's alpha coefficient was measured at 0.87, which is representative of good internal reliability of the questionnaire.

It was observed that for failed implementations, the affected teams felt lost and often asked for guidance from the implementation team, management, or the technical teams. For successful implementations, the change management team was active in providing support, project status and communications throughout the project.

4.4.2 How was training conducted

The form of training provided during RPA implementation is an indication of the resources available to employees. Change management views training (in its various forms) as a tool that allows employees to learn or adapt to a change in working practice. Participants' responses are summarised in Table 4.6 and illustrated in Figure 4.8.

Table 4.6: How was training conducted?

Response	Success	Failure	Uncertain
Classroom training supported by e-Learning	35%	0%	19%
Face to face training	41%	0%	10%
e-Learning only	14%	6%	48%
Training and information was provided on an ad hoc basis	10%	42%	19%
There was no training required	0%	52%	5%

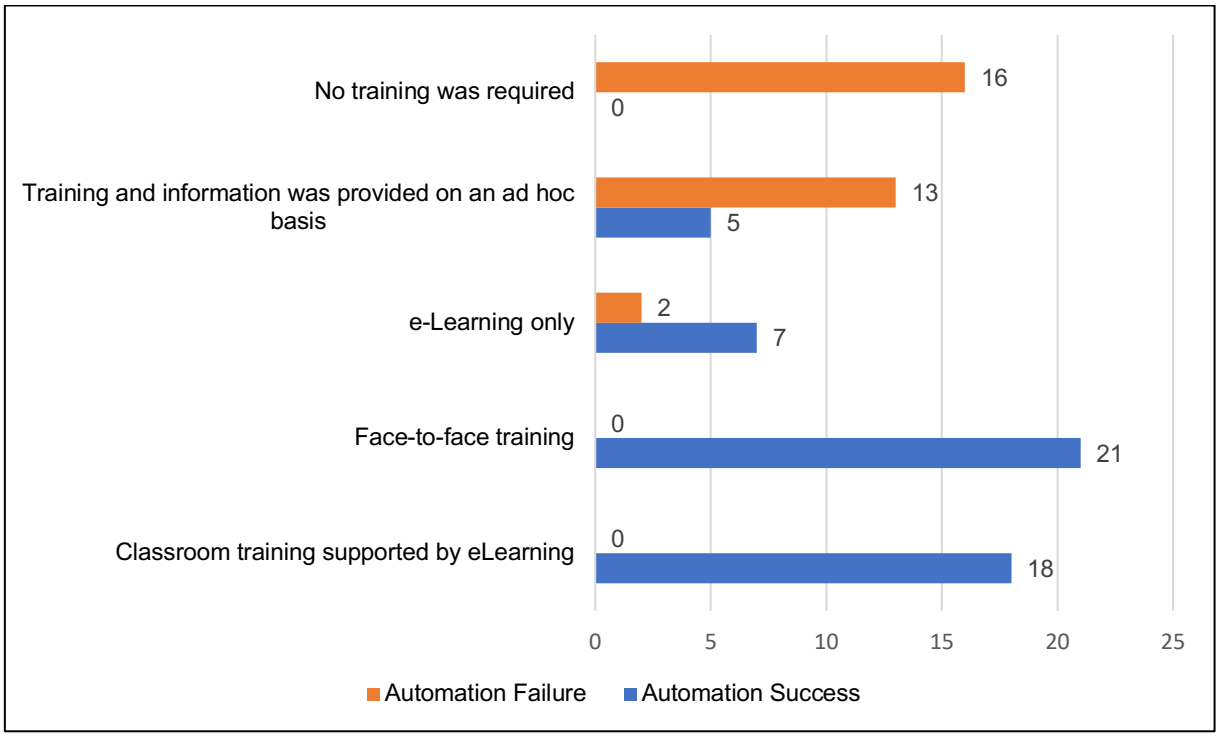


Figure 4.8: Training provided

The statistical metrics observed for the form of training provided yielded a Pearson's correlation coefficient of 0.78 indicating a strong positive correlation between the type of training provided and the project outcome. The ANOVA statistic was calculated at 0.01, indictive of a statistically significant result. Cronbach's alpha coefficient was calculated at 0.86, indicating a good measure of reliability.

In organisations where RPA implementations were successful, participants reported that training was provided mainly face to face and through classrooms supported by e-learning. Where RPA implementations failed, participants indicated that either no training was required, or that training was provided only when requested by the employees.

4.4.3 How were employees prepared for change?

For RPA type projects where day-to-day activities for employees are required to change, employees need to be prepared to adopt and adapt. The more open the communication is on the expected change, the better equipped employees will be to prepare themselves for the effects of the change (Table 4.7).

Table 4.7: How were employees prepared for change?

Response	Success	Failure	Uncertain
Employees had to actively engage with management to understand the change	0%	61%	10%
Management shared updates on the automation project regularly	31%	0%	33%
Only the change management team communicated with the team upon reaching project milestones	8%	3%	38%
Project updates were only mentioned during general status meetings	8%	35%	14%
The change was communicated at the start of the project and measured throughout	53%	0%	5%

Figure 4.9 demonstrates the impact of communication on project implementation.

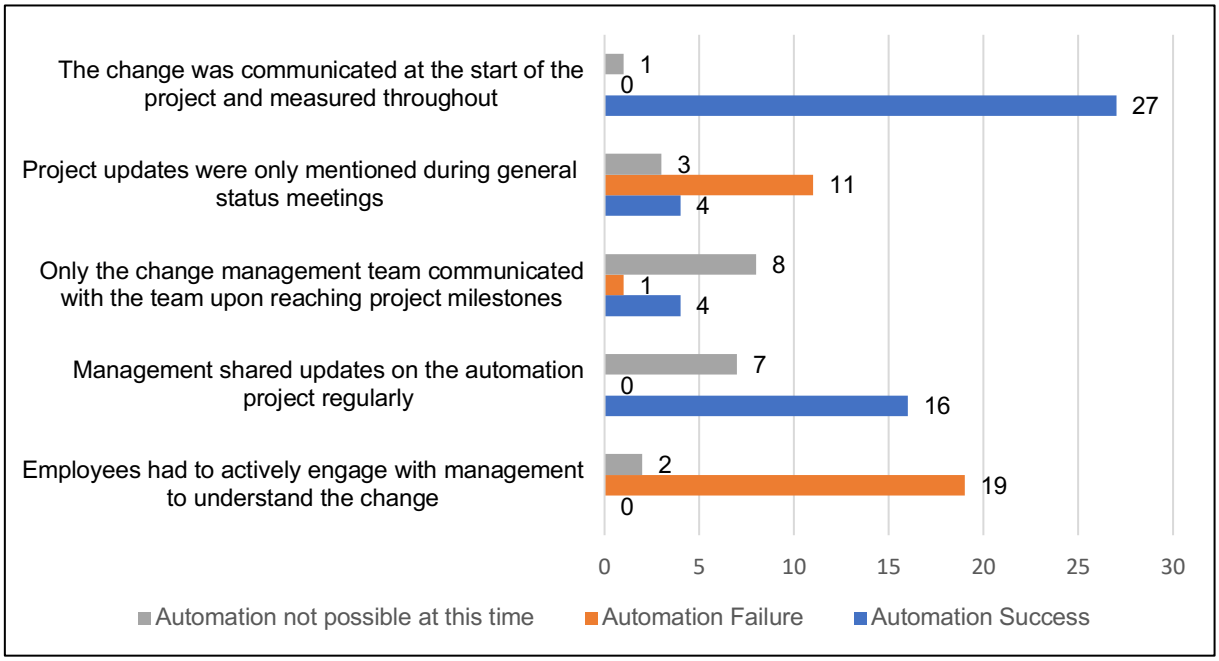


Figure 4.9: Preparing employees for change

The statistical results in the comparison of this question (How were employees prepared for change?) to the project outcome resulted in a Pearson's correlation coefficient of 0.82, an ANOVA statistical measure of 0.04 and a Cronbach alpha coefficient of 0.90. The correlation was seen as positively significant in the type of training against the project outcome. The ANOVA test resulted in statistically significant results at a 95% confidence internal, and the Cronbach coefficient produced an excellent reliability measure.

The data reveals that successful projects benefited from change being communicated at the start of the project and measured throughout, and the project team sharing regular project status updates. Failed projects resulted mostly in reactive engagement from employees to project management, with project updates only being shared during general status meetings.

4.4.4 Type of training provided

The type of training is relevant to how employees worked with their RPA implementation teams. This type of training is representative of how well they would be able to work with the automation. Table 4.8 provides some insights into the differences in training provided between projects that succeeded and those that failed.

Table 4.8: What was the purpose of the training provided?

Response	Success	Failure	Uncertain
Employees had sufficient knowledge of their jobs and their focus would be shifted immediately to more value-adding activities	10%	29%	5%
Training was not necessary	2%	68%	10%
Training was provided as some people would have to be relocated to other areas of the organisation	24%	3%	33%
Training was provided for employees to improve their skills and focus on more value-adding activities	18%	0%	43%
Training was provided to allow them to work side by side with an automated solution	47%	0%	10%

The data demonstrated that successful RPA projects promoted training for employees working with automation, and training for the employees to be displaced into other areas of the business. Failed RPA projects showed little training delivered to employees, either because they felt that that training was not necessary or assumed that the employees had sufficient knowledge to engage in other value-adding activities in the business (Figure 4.10).

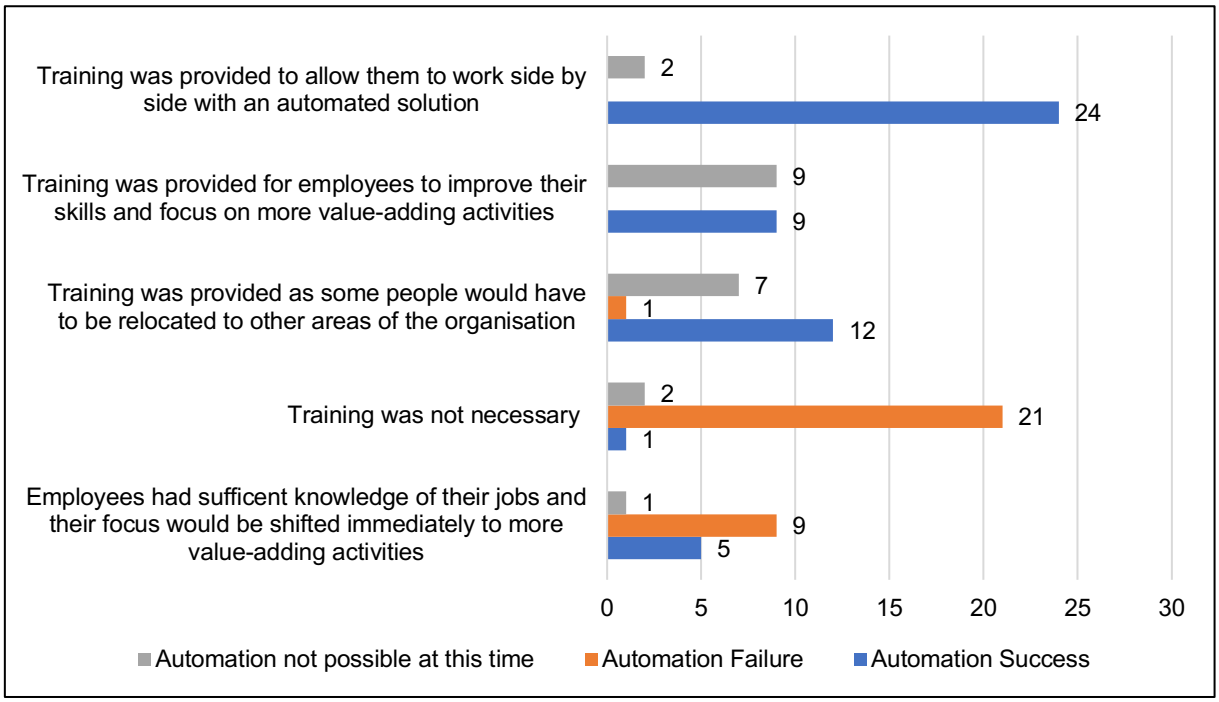


Figure 4.10: Type of training provided

The statistical results showed a Pearson's correlation coefficient of 0.67, revealing a weaker relationship to the project outcome. The ANOVA significance was 0.04 lower than the previous analysis but still resulted in a significant outcome. The Cronbach coefficient was measured at 0.78, indicative of strong test reliability.

4.5 JOB CONSIDERATIONS

The impact of automation on job security is a key metric in for the South African worker as many expect the introduction of automation to disrupt their jobs. In asking participants about the impact of RPA on job security, the researcher aimed to understand the company's efforts to address the effects of automation that may result in the displacement of employees.

The impact on job security, displacement of workers, and careers was also a single option question for respondents.

4.5.1 Impact on job security

The impact on job security can be measured according to the proactive steps an organisation takes when embarking on an automation project. Successful RPA implementations demonstrated a propensity for analysing the impact of automation before the project had started or throughout the project. On the other hand, failed

RPA projects only considered the automation outcome before determining how employees would be displaced (Table 4.9). These differences are illustrated clearly in Figure 4.11.

Table 4.9: What was the impact of RPA on job security?

Response	Success	Failure	Uncertain
An analysis was carried out at the start of the project and the implementation time was used to train and relocate people	25%	0%	29%
An analysis was carried out before automation was introduced to ascertain how many people would be affected	57%	3%	5%
Depending on performance, some staff would be made redundant and others would remain employed	10%	13%	24%
Little analysis was carried out; the success of the project would determine how people would be displaced in time	2%	81%	5%
Only key staff would remain on the process; the rest would be relocated internally	6%	3%	38%

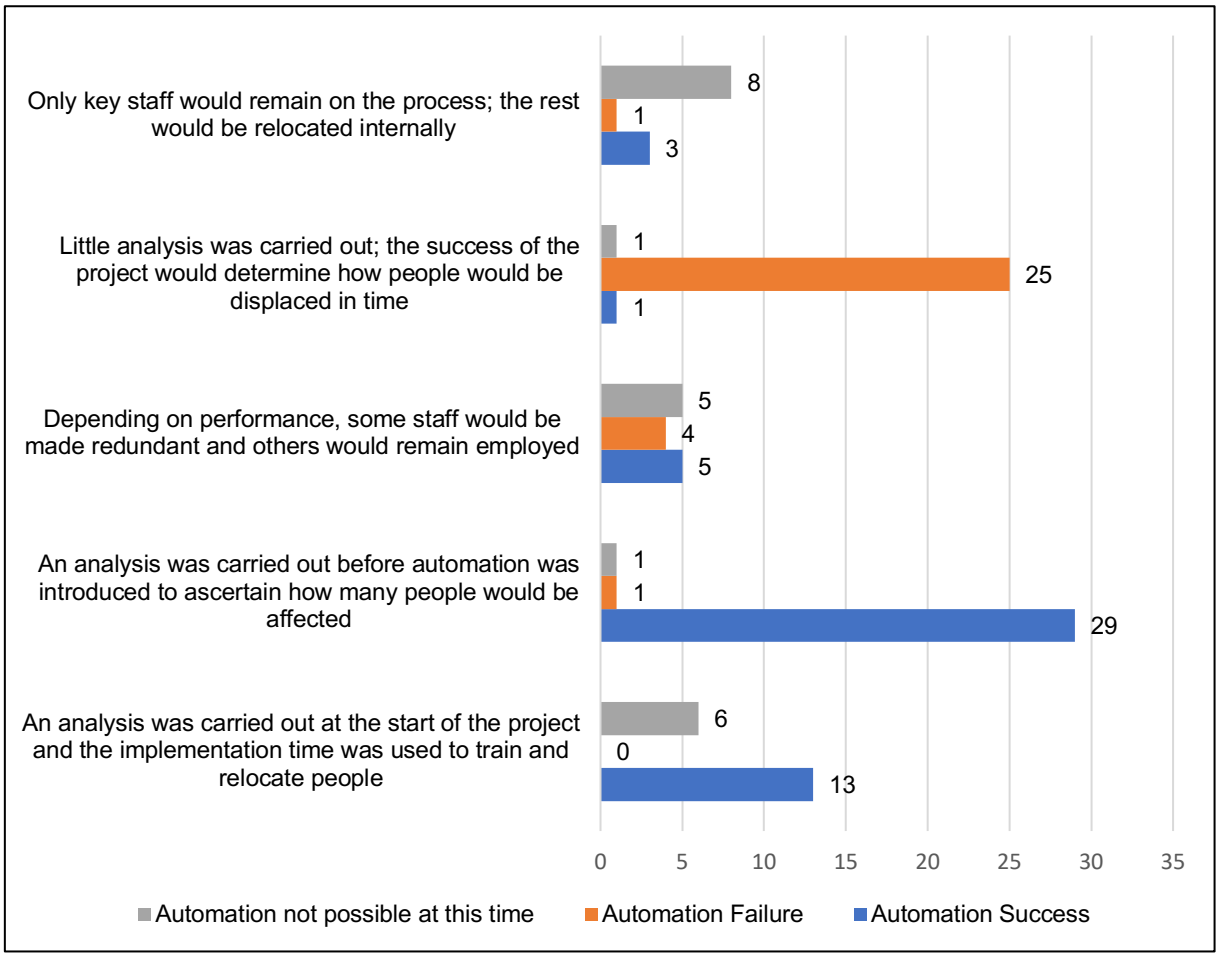


Figure 4.11: Project impact on job security

The statistical metrics observed for the form of training provided yielded a Pearson's correlation coefficient of 0.74, indicating a relatively strong positive correlation between the impact on job security and the project outcome. The ANOVA statistic was calculated at 0.01, indictive of a statistically significant result. Cronbach's alpha coefficient was calculated at 0.85, indicating a good reliability measure.

4.5.2 Displacement of workers

The likelihood of workers being displaced subsequent to RPA is indicative of the outcome of the project. Successful RPA projects were more likely to displace workers than unsuccessful ones. This observation is aligned with the expectations of the continuation of automation initiatives.

Successful RPA projects have a propensity (between somewhat likely and very likely) to relocate workers, whereas unsuccessful projects are more likely to maintain the workforce in their current roles (Table 4.10 and Figure 4.12).

Table 4.10: How likely is it that employees will be displaced through automation?

Response	Success	Failure	Uncertain
Neither likely nor unlikely	6%	0%	0%
Somewhat likely	45%	0%	71%
Somewhat unlikely	6%	52%	14%
Very likely	41%	0%	14%
Very unlikely	2%	48%	0%

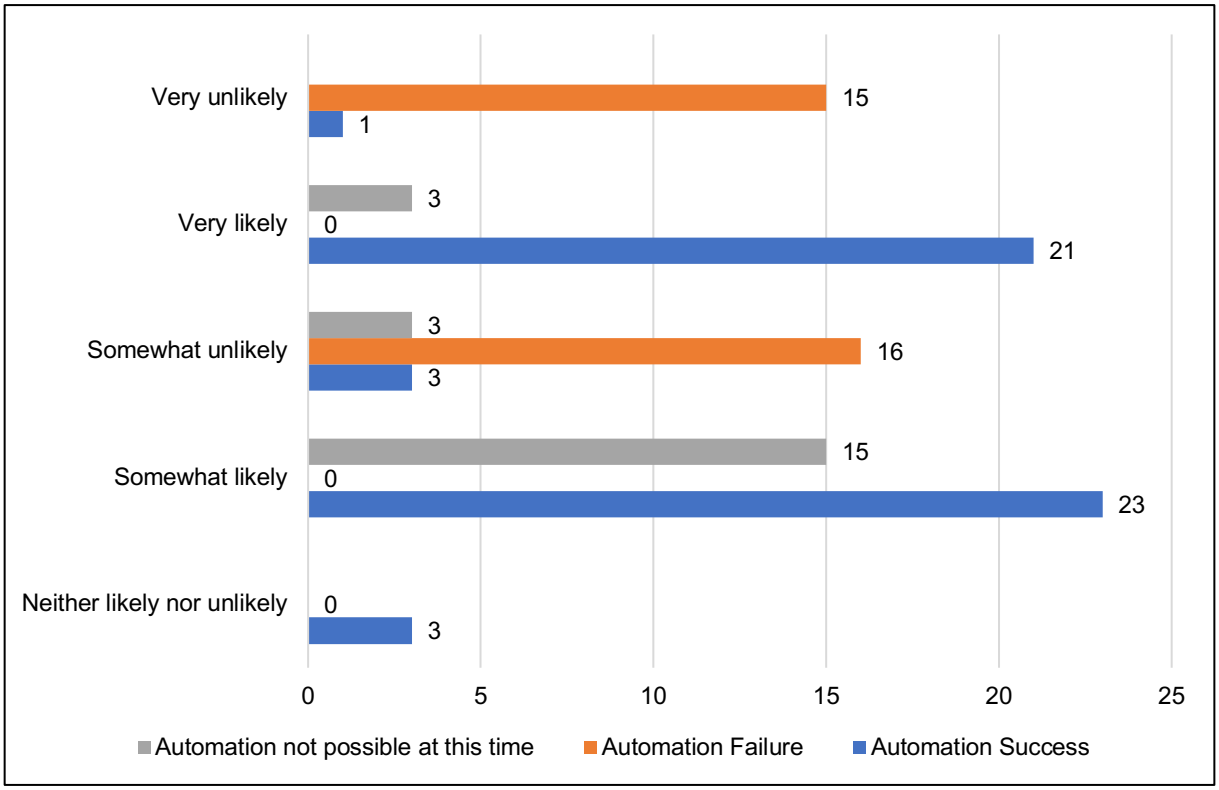


Figure 4.12: Likelihood of employee displacement

The statistical results in the comparison of the likelihood of employee displacement to the project outcome resulted in a Pearson's correlation coefficient of 0.79, an ANOVA statistical measure of 0.01 and a Cronbach's alpha coefficient of 0.88. The correlation was seen as positively significant in terms of the likelihood of employee displacement against the project outcome. The ANOVA test resulted in statistically significant results at a 95% confidence interval, with Cronbach's coefficient producing a good reliability measure.

4.5.3 Careers affected post automation

It is crucial that the impact of automation on employees' careers is considered when implementing RPA projects. Table 4.11 and Figure 4.13 illustrate participants' views on the effect of automation on employees' careers.

Table 4.11: How will careers be affected post automation?

Response	Success	Failure	Uncertain
I am unsure of how roles and responsibilities will be affected	2%	29%	10%
It is too early to determine the effect that automation will have on the organisation	20%	0%	33%
Jobs and career paths remain unchanged	2%	68%	0%
The organisation is pivoting towards automation as a strategic initiative, which will result in a reformulation of roles and responsibilities	63%	3%	24%
This is an important topic that is being discussed as more automation is being implemented	14%	0%	33%

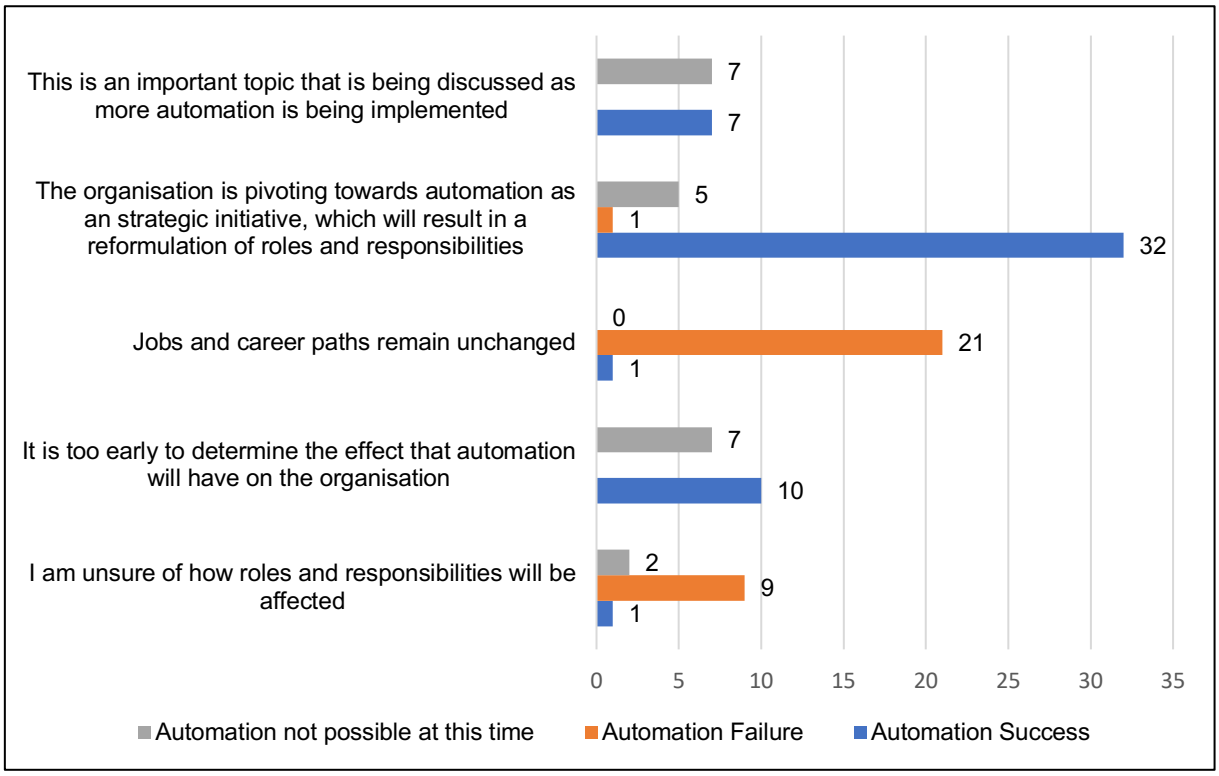


Figure 4.13: Careers affected post automation

The statistical metrics observed for the effect that RPA would have on employees' careers yielded a Pearson's correlation coefficient of 0.82, indicating a strong positive correlation between the impact on careers and the project outcome. The ANOVA statistic was calculated at 0.01, indicative of a statistically significant result. Cronbach's alpha coefficient was calculated at 0.90, revealing a very strong reliability measure.

Successful RPA projects result in a reformulation of employees' roles and responsibilities. For unsuccessful projects, jobs remain largely unchanged, or there is uncertainty about how their roles will be impacted by automation.

4.6 BENEFITS BEYOND THE ORGANISATION

South African employees noted community collaboration as an important criterion that leads to job satisfaction. As RPA projects are being considered across different industries, the acceptance and adoption of RPA is related to the impact that these projects have outside of the organisation.

It was observed that successful automation projects have elements that expand outside of the organisation, whereas failed RPA implementations are limited to internal activities (Table 4.12 and Figure 4.14).

Table 4.12: How will automation affect stakeholders outside the organisation?

Response	Success	Failure	Uncertain
External parties have the option to interact with the automation	8%	16%	24%
The automation has some elements that will benefit society	29%	0%	10%
The automation technology will be shared with people outside of the organisation	31%	0%	5%
The automation will start in the organisation and could extend to the public	27%	3%	33%
The benefits of the automation are only aimed at individuals within the organisation	4%	81%	29%

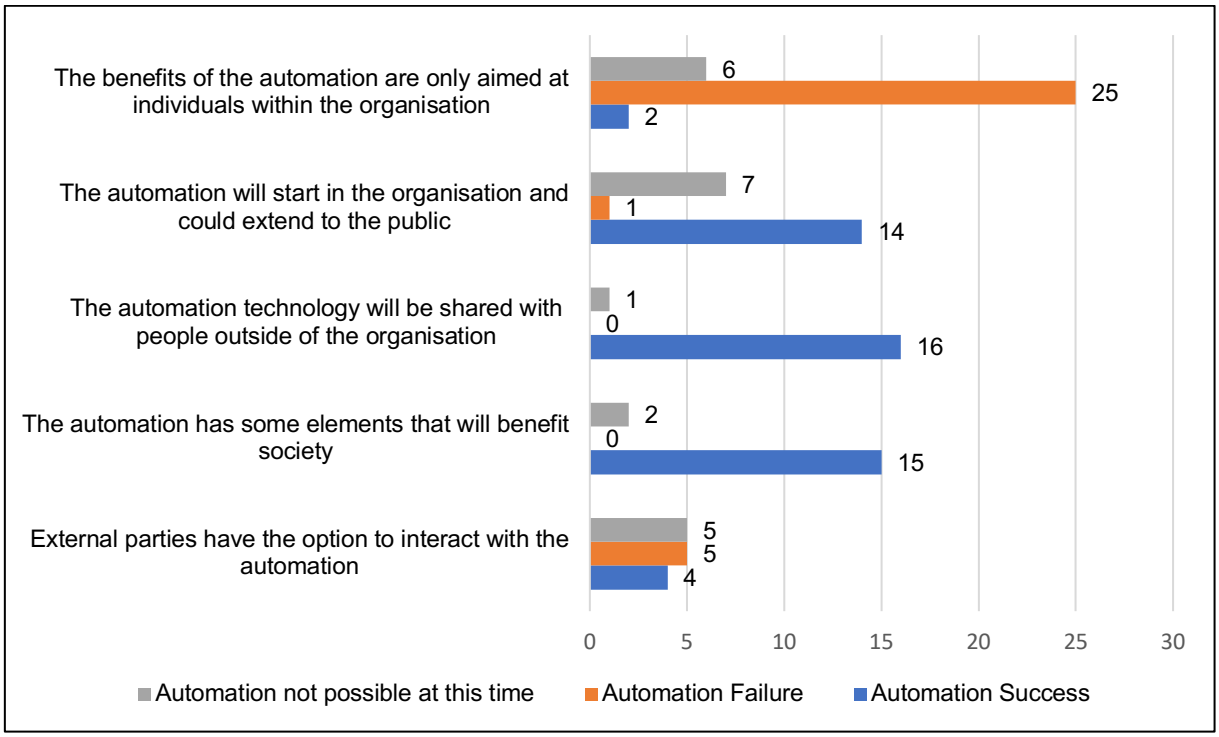


Figure 4.14: The impact of automation outside of the organisation

The statistical results in the comparison of the impact of RPA outside of the organisation to the project outcome resulted in a Pearson's correlation coefficient of 0.70, an ANOVA statistical measure of 0.02 and a Cronbach's alpha coefficient of

0.82. The correlation was seen as positively significant in terms of reaching outside of the organisation against the project outcome. The ANOVA test resulted in statistically significant results at a 95% confidence and Cronbach's coefficient yielded a strong reliability measure.

4.7 IMPACT ON INDIVIDUAL PRODUCTIVITY

Automation is designed to affect individuals' productivity by removing manual tasks and replacing them with an automated process. The extent to which individual productivity is affected depends on the nature of the automation. Automation can be introduced for a single process or a manual task. Furthermore, the number of users affected will determine the extent of success of the automation introduced.

As illustrated in Table 4.13 and Figure 4.15, failed automation projects were found to be linked to smaller groups that perform many manual tasks. Successful projects are characterised by the automation of tasks that form part of a larger process.

Table 4.13: How will automation affect individual productivity?

Response	Success	Failure	Uncertain
The automation is aimed at processes executed by individuals, culminating in a broader process	69%	3%	19%
The automation is introduced for a new process previously not performed	4%	3%	29%
The automation is limited to a small group of users that perform many manual tasks	4%	77%	5%
The automation will replace some manual functions affecting many users across the organisation	10%	6%	24%

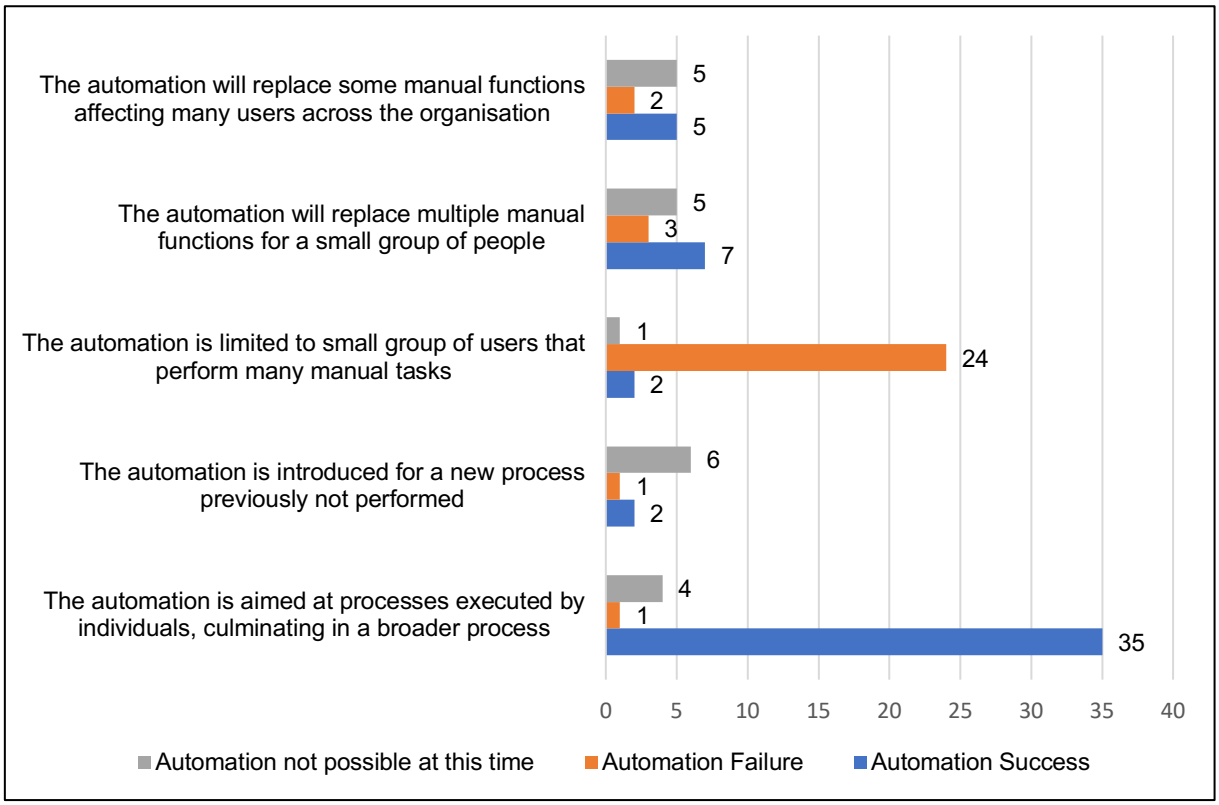


Figure 4.15: Impact of automation on individual productivity

The statistical results showed a Pearson's correlation coefficient of 0.69 which suggests a positive relationship between the success of the project outcome and the impact of individual productivity with respect to automation being part of a larger process. The ANOVA measure of statistical significance was calculated at $\rho = 0.01$, lower than 0.05 (95%) and resulting in significant measures of the sample size. Cronbach's alpha coefficient was measured at 0.82, which is representative of a good internal reliability of the questionnaire.

4.8 CHANGE MANAGEMENT ACTIVITIES

Projects are subject to change management activities and, in the case of successful versus failed projects, it is necessary to list which elements were carried out well and which needed more focus. The questions in Table 4.14 and Table 4.15 allowed respondents to select multiple answers based on what was observed as well executed and what needed more involvement. The questions were then linked to the successful and failed RPA projects to gain an understanding of activities relating to each. The responses to the questions are illustrated below in Table 4.14 and Figure 4.16, and Table 4.15 and Figure 4.17, respectively.

4.8.1 Change management areas that were carried out successfully

Successful projects observed the following activities being carried out effectively: (i) process alignment, (ii) adoption initiatives, (iii) culture and definition alignment, (iv) training and development, (v) organisational alignment, (vi) strategic alignment and management alignment. Failed projects observed (i) project management, (ii) strategic alignment and (iii) management alignment as the activities performed in the change management process.

Table 4.14: What change management areas were well executed?

Response	Success	Failure	Uncertain
Communications	3%	10%	8%
Management alignment	6%	13%	7%
Strategic alignment	8%	18%	11%
Training and development	12%	1%	8%
Culture definition and alignment	13%	1%	5%
Process alignment	14%	8%	9%
Organisational alignment	11%	2%	7%
Adoption initiatives	14%	0%	8%
Roles and responsibilities	9%	1%	8%
Scalability across the organisation	3%	8%	9%
Project management	4%	27%	10%
Success tracking and lessons learnt	4%	11%	10%

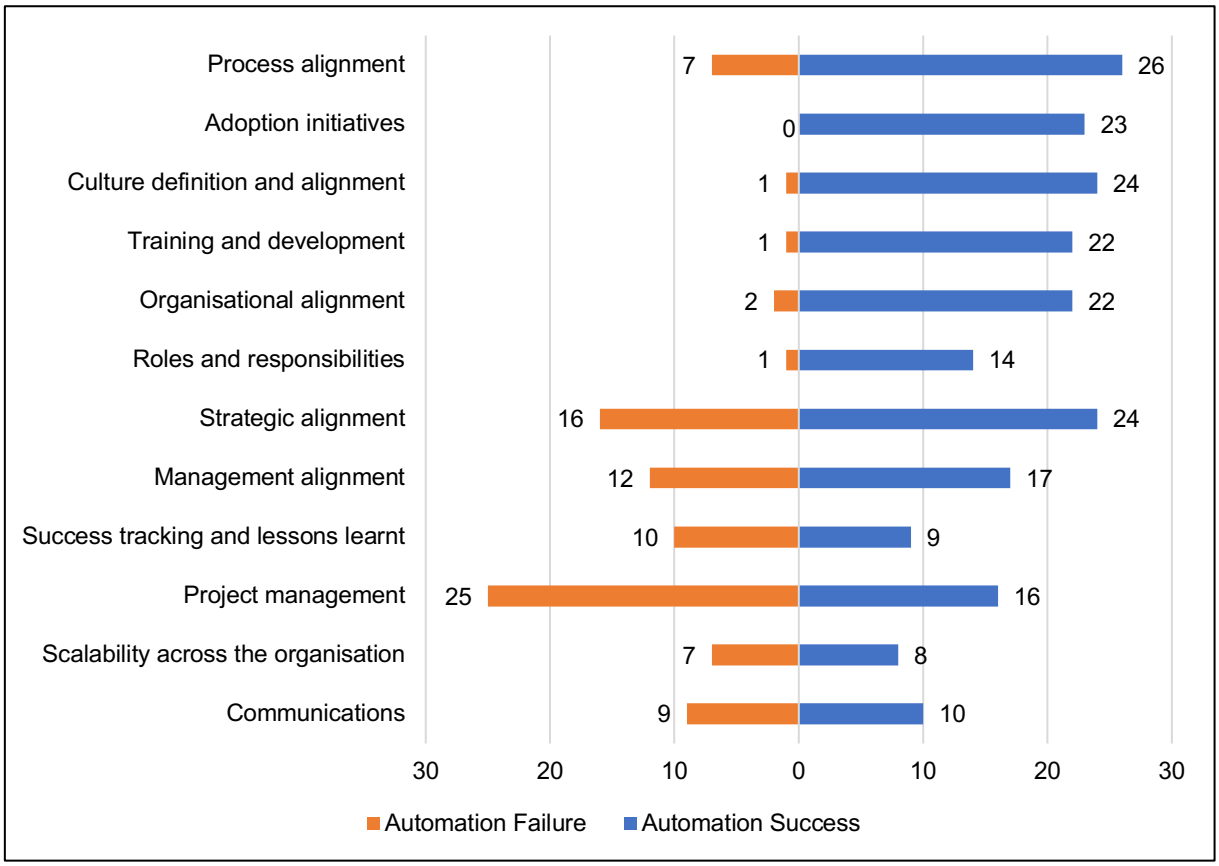


Figure 4.16: Change management areas carried out most successfully

4.8.2 Change management areas needing more involvement

The change management activities requiring more involvement were very similar between the successful and failed RPA projects. In both cases, (i) culture definition and alignment, (ii) communications, (iii) success tracking and lessons learnt, (iv) training and development, and (v) project management were identified as areas requiring improvement.

Table 4.15: Which change management areas could improve?

Response	Success	Failure	Uncertain
Communications	13%	14%	14%
Management alignment	5%	3%	3%
Strategic alignment	5%	1%	3%
Training and development	9%	19%	14%

Response	Success	Failure	Uncertain
Culture definition and alignment	12%	20%	14%
Process alignment	9%	2%	5%
Adoption initiatives	9%	12%	16%
Roles and responsibilities	8%	7%	8%
Scalability across the organisation	4%	3%	3%
Project management	10%	6%	8%
Success tracking and lessons learnt	11%	10%	5%

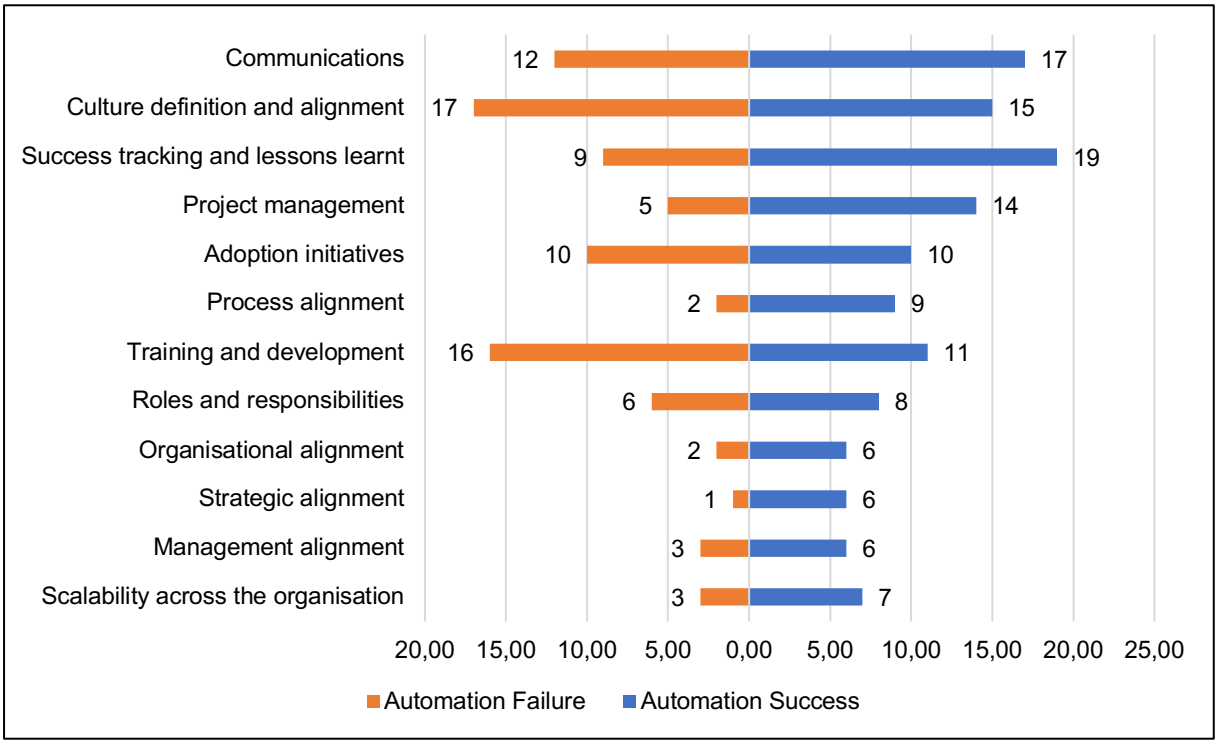


Figure 4.17: Change management that required more involvement

4.9 AUTOMATION READINESS

The final question relates to how ready the organisation would be to adopt automation across other business areas. There was a strong correlation between successful projects and likely adoption of automation and failed projects and resisting change, as shown in Table 4.16 and Figure 4.18.

Table 4.16: How ready is the organisation to adopt automation?

Response	Success	Failure	Uncertain
Automation should start small before it is generally adopted	4%	6%	48%
People are hesitant about automation because they do not understand it	4%	9%	14%
Somewhat ready	14%	6%	38%
Very ready	78%	6%	0%
We are far away from automation and people will resist change	0%	73%	0%

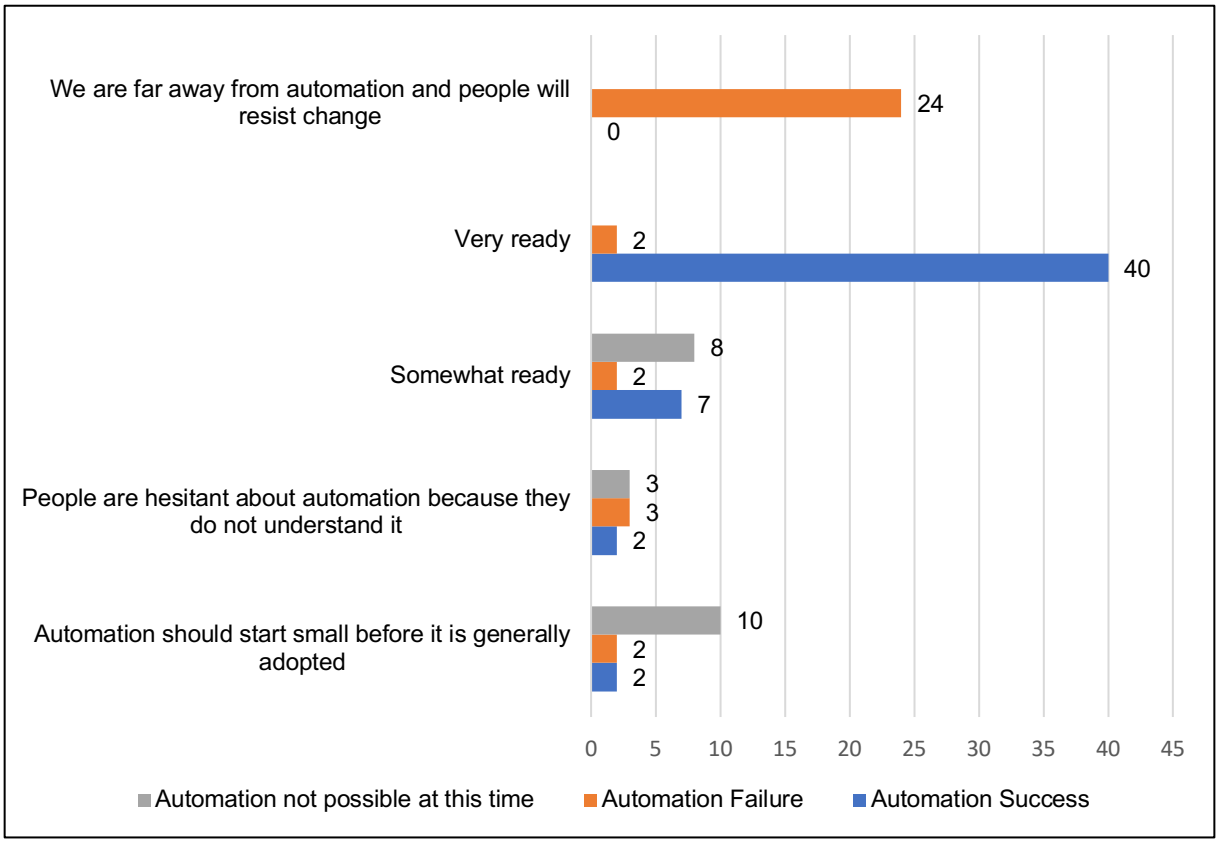


Figure 4.18: Organisational readiness to adopt automation

The statistical results in the automation readiness to the project outcome resulted in a Pearson's correlation coefficient of 0.73, an ANOVA statistical measure of 0.01 and

Cronbach's alpha coefficient of 0.85. The correlation was seen as positively significant in the likelihood of further adoption of automation against the project outcome. The ANOVA test resulted in statistically significant results at a 95% confidence interval and the Cronbach coefficient yielded a strong reliability measure.

The study found that successful RPA projects perceived automation as a strategic tool that can be replicated and adopted across the organisation, whereas failed automation projects would reject further change. These findings indicate that the change management activities were executed successfully.

4.10 CORRELATION ANALYSIS

A further correlation analysis was performed between the remaining questions with respect to the successful or failed project outcome. Table 4.17 depicts the variables and draws a comparison between the successful or failed outcomes.

Table 4.17: Correlation analysis

Question	Success responses	Failure responses
5. In your opinion were the employees adequately supported during RPA implementation?	The change management team was active in providing support and communicating the end state (78%)	The teams felt lost and often asked for guidance (81%)
6. As part of the adopted automation, how was the training conducted?	Face-to-face training (41%) Classroom training supported by e-learning (35%)	Training and information was provided on an ad hoc basis (42%) No training was required (52%)
7. How was the change communicated throughout the implementation process?	The change was communicated at the start of the project and measured throughout (53%) Management shared updates on the automation project regularly (31%)	Employees had to actively engage with management to understand the change (61%) Project updates were only mentioned during general status meetings (35%)
8. What was the purpose of the training provided to the employees affected by the change?	Training was provided that would allow employees to work side by side with the automated solution (47%) Training was provided as some people would have to be relocated to other areas of the organisation (24%)	Training was not necessary (68%)
9. When considering automation, how were the effects of job security considered?	An analysis was carried out before automation was introduced to ascertain how many people would be affected (57%)	Little analysis was carried out; the success of the project would determine how people would be relocated in time (81%)

Question	Success responses	Failure responses
10. How likely is it that that automation will displace workers?	Somewhat likely (45%) Very likely (41%)	Somewhat unlikely (52%) Very unlikely (48%)
11. Given that automation reduces the manual intervention in processes, how are people's career paths affected post automation?	The organisation is pivoting towards automation as a strategic initiative, which will result in a reformulation of roles and responsibilities (63%)	Jobs and career paths remain unchanged (68%)
12. Are there any benefits of the automation that will be extended to benefit society or is it limited to the organisation?	The automation technology will be shared with people outside of the organisation (31%) The automation has some elements that will benefit society (29%) The automation will start in the organisation and could extend to the public (27%)	The benefit of the automation is only aimed at individuals within the organisation (81%)
13. How is the automation aimed at increasing individual productivity?	The automation is aimed at processes executed by individuals, culminating in a broader process (69%)	The automation is limited to small group of users that perform many manual tasks (77%)
16. Do you believe that your organisation is ready to adopt automation based on people’s readiness and cultural criteria?	Very ready (78%)	We are far away from automation and people will resist change (73%)

The correlation analysis was performed between the successful responses and in a separate analysis between the successful and failed implementation responses (Figure 4.19) to analyse the strength of the variables.

The correlation between the successful implementation responses is observed in the cells below the grey line. The correlation between failed implementation responses and the successful implementations is read above grey line.

Due to the number of responses, the successful implementation responses against the failed implementation are separated in two sections above the grey line in the two tables below.

The strength was measured in two forms, strong with a correlation between 0,80 to 1,00 (–0,80 t0 –1,00) and medium between 0,75 to 0,79 (–0,75 to –0,79) (Leedy & Ormrod, 2010).

Failed Implementations

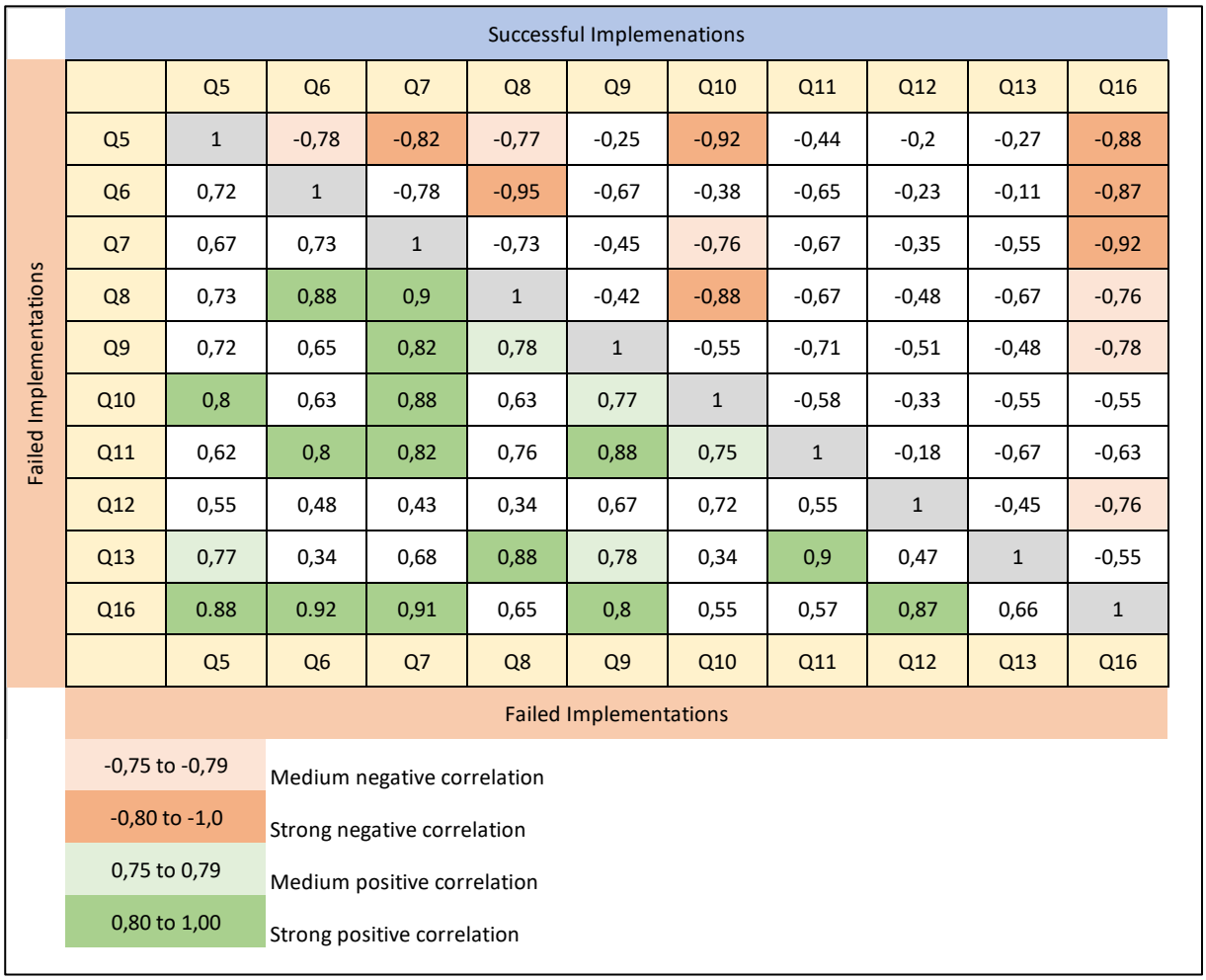
Successful Implementations	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q16
Q5	1	-0,32	-0,91	-0,88	-0,4	-0,32	-0,4	-0,11	-0,23	-0,9
Q6	0,82	1	-0,3	-0,87	-0,77	-0,15	-0,51	-0,34	-0,14	-0,78
Q7	0,77	0,92	1	-0,9	-0,32	-0,43	-0,77	-0,29	-0,27	-0,55
Q8	0,9	0,88	0,8	1	-0,39	-0,61	-0,49	-0,12	-0,13	-0,88
Q9	0,72	0,76	0,72	0,65	1	-0,8	-0,79	-0,09	-0,55	-0,67
Q10	0,77	0,65	0,62	0,7	0,82	1	-0,81	-0,34	-0,62	-0,59
Q11	0,88	0,67	0,78	0,72	0,76	0,67	1	-0,18	-0,25	-0,57
Q12	0,55	0,6	0,63	0,45	0,45	0,59	0,39	1	-0,5	-0,78
Q13	0,72	0,72	0,55	0,77	0,58	0,69	0,55	0,55	1	-0,77
Q16	0,92	0,87	0,86	0,91	0,82	0,72	0,82	0,88	0,72	1
	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q16

Successful Implementations

-0,75 to -0,79	Medium negative correlation
-0,80 to -1,0	Strong negative correlation
0,75 to 0,79	Medium positive correlation
0,80 to 1,00	Strong positive correlation

Figure 4.19: Correlation of successful against failed implementations

A correlation analysis was also performed on the failed implementations (Figure 4.20) and correlated against the successful outcomes to understand the strength of the variable's interaction.



Failed Implementations \ Successful Implemenations	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q16
Q5	1	-0,78	-0,82	-0,77	-0,25	-0,92	-0,44	-0,2	-0,27	-0,88
Q6	0,72	1	-0,78	-0,95	-0,67	-0,38	-0,65	-0,23	-0,11	-0,87
Q7	0,67	0,73	1	-0,73	-0,45	-0,76	-0,67	-0,35	-0,55	-0,92
Q8	0,73	0,88	0,9	1	-0,42	-0,88	-0,67	-0,48	-0,67	-0,76
Q9	0,72	0,65	0,82	0,78	1	-0,55	-0,71	-0,51	-0,48	-0,78
Q10	0,8	0,63	0,88	0,63	0,77	1	-0,58	-0,33	-0,55	-0,55
Q11	0,62	0,8	0,82	0,76	0,88	0,75	1	-0,18	-0,67	-0,63
Q12	0,55	0,48	0,43	0,34	0,67	0,72	0,55	1	-0,45	-0,76
Q13	0,77	0,34	0,68	0,88	0,78	0,34	0,9	0,47	1	-0,55
Q16	0.88	0.92	0,91	0,65	0,8	0,55	0,57	0,87	0,66	1
	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q16

Failed Implementations

-0,75 to -0,79	Medium negative correlation
-0,80 to -1,0	Strong negative correlation
0,75 to 0,79	Medium positive correlation
0,80 to 1,00	Strong positive correlation

Figure 4.20: Correlation of failed against successful implementations

A strong positive correlation means that the variables move in the same direction – the higher the correlation value, the stronger the relationship between the variables (Leedy & Ormrod, 2010).

Inversely, if the correlation approximates –1.00, then there is a strong negative correlation indicating that the variables have a strong negative effect on each other (Leedy & Ormrod, 2010).

The correlation analysis between the successful and failed implementation responses shows how each combination of responses will react against the other variable. The correlation predicts how variables will react; either they will reinforce each other, or they will have opposite effects on each other.

4.11 DISCUSSION OF HYPOTHESIS TESTS CONDUCTED

The hypotheses were tested using inferential statistics as discussed in Section 3 on the research design. Several null hypotheses were presented and tested against the successful RPA project outcome. As mentioned in the data analysis section, the ANOVA single test was used to test the hypotheses, the results of which are discussed in the section below.

4.11.1 Training

The null hypothesis stated:
H_0: Training does not support successful RPA implementation.

As indicated in Table 4.18, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.18: ANOVA – Training

Source of variation	SS	df	MS	F	p-value	F crit
Rows	452.8738	102	4.439939	7.281611	5.54E-21	1.387152
Columns	3.805825	1	3.805825	6.241648	0.014075	3.934253
Error	62.19417	102	0.609747			
Total	518.8738	205				

4.11.2 Preparing employees for change

The null hypothesis stated:
H_0: Preparing employees for change does not support successful RPA implementation.

As indicated in Table 4.19, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.19: ANOVA – Preparing employees for change

Source of variation	SS	df	MS	F	p-value	F crit
Rows	495.6019	102	4.858843	9.841334	2.85E-26	1.387152
Columns	2.140777	1	2.140777	4.336032	0.039816	3.934253
Error	50.35922	102	0.493718			
Total	548.1019	205				

4.11.3 Training process

The null hypothesis stated:

H_0: The training process is not related to successful RPA implementation.

As indicated in Table 4.20, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.20: ANOVA – Training process

Source of variation	SS	df	MS	F	p-value	F crit
Rows	433.1165049	102	4.246240244	4.902846467	1.0956E-14	1.387152204
Columns	8.160194175	1	8.160194175	9.422024398	0.002747218	3.934253441
Error	88.33980583	102	0.866076528			
Total	529.6165049	205				

4.11.4 Job security

The null hypothesis stated:

H_0: Job security considerations are not related to successful RPA implementation.

As indicated in Table 4.21, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.21: ANOVA – Job security

Source of variation	SS	df	MS	F	p-value	F crit
Rows	547.3883495	102	5.366552446	6.616711654	2.19745E-19	1387152.204
Columns	15.77184466	1	15.77184466	19.44595705	2.56881E-05	3.934253441
Error	82.72815534	102	0.811060346			
Total	645.8883495	205				

4.11.5 Displacement of workers

The null hypothesis stated:

H_0: The displacement of people is not associated with successful RPA implementation.

As indicated in Table 4.22, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.22: ANOVA – Displacement of workers

Source of variation	SS	df	MS	F	p-value	F crit
Rows	623.1067961	102	6.108890158	8.530037214	1.0263E-23	1.387152204
Columns	0.951456311	1	0.951456311	1.328548644	0.251757723	3.934253441
Error	73.04854369	102	0.716162193			
Total	697.1067961	205				

4.11.6 Impact on careers

The null hypothesis stated:

H_0: Careers are not impacted by successful RPA implementation.

As indicated in Table 4.23, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.23: ANOVA – Impact on careers

Source of variation	SS	df	MS	F	p-value	F crit
Rows	615.2621359	102	6.031981725	9.982986767	1.56553E-26	1.387152204
Columns	4.368932039	1	4,.68932039	7.230623819	0.008373131	3.934253441
Error	61.63106796	102	0.604226156			
Total	681.2621359	205				

4.11.7 Benefits to society

The null hypothesis stated:

H_0: Societal benefits are not related to successful RPA implementation.

As indicated in Table 4.24, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.24: ANOVA – Benefits to society

Source of variation	SS	df	MS	F	p-value	F crit
Rows	570.9126214	102	5.597182562	5.687040619	5.97112E-17	1.387152204
Columns	5.611650485	1	5.611650485	5.701740812	0.01878873	3.934253441
Error	100.3883495	102	0.984199505			
Total	676.9126214	205				

4.11.8 Changes in individual productivity

The null hypothesis stated:

H_0: Reducing individual productivity is localised to single processes in successful RPA implementation.

As indicated in Table 4.25, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.25: ANOVA – Changes in individual productivity

Source of variation	SS	df	MS	F	p-value	F crit
Rows	533.5533981	102	5.230915667	5.462823062	2.52436E-16	1.387152204
Columns	16.33009709	1	16.33009709	17.05407555	7.4476E-05	3.934253441
Error	97.66990291	102	0.957548068			
Total	647.5533981	205				

4.11.9 Adoption readiness

The null hypothesis stated:

H_0: Automation readiness is not related to successful RPA implementation.

As indicated in Table 4.26, the p-value is significantly lower than 0.05 resulting in the rejection of the null hypothesis.

Table 4.26: ANOVA – Adoption readiness

Source of variation	SS	df	MS	F	p-value	F crit
Rows	526.5242718	102	5.162002665	6.512007685	4.01686E-19	1.387152204
Columns	21.14563107	1	21.14563107	26.67579251	1.19619E-06	3.934253441
Error	80.85436893	102	0.792689891			
Total	628.5242718	205				

4.12 CONCLUSION

This chapter presented the results of the data analysis in alignment with the problem and objectives outlined in Chapter 1, summarised as follows:

- The sample population approximates a normal population.
- With respect to the automation project metrics, there is a clear distinction in the

responses between successful and failed implementations: (i) the aim of the project, (ii) the areas that presented the biggest challenges, and (iii) the change management approach. All resulted in significantly distinct outcomes.

- The employee involvement analysis in (i) support provided, (ii) training conducted, (iii) employee preparation, and (iv) type of training provided also resulted in statistically significant outcomes between the successful and failed implementation responses.
- The job consideration statistics – (i) impact on job security, (ii) displacement of workers, and (iii) career affected by automation – yielded statistically significant results against failed and successful automation implementations.
- The automation impact on the benefits to the organisation resulted in three areas reported on for successful implementations and one area for failed implementations.
- The impact on individual productivity showed a significant distinction between the failed and successful implementation of RPA projects.
- Change management activities gave significant results in the areas that were carried out successfully but a lesser result in the areas that required improvement.
- The automation readiness presented a clear distinction between successful and failed implementations.
- The correlation analysis between the positive and negative outcome levels resulted in expected strong and medium, positive and negative correlations, in line with the successful and failed implementation outcomes.

The Pearson's correlation coefficient between the project outcome and the independent variables resulted in positively strong results. The ANOVA measure of statistical significance in the cases observed resulted in a significant finding and the Cronbach's alpha coefficient measured a statistically significant questionnaire.

CHAPTER 5: DISCUSSION OF RESULTS

5.1 INTRODUCTION

As companies continue to drive robotic process automation (RPA) initiatives, their adoption, usability and value are crucial to determining the success of their implementation and how the organisation will react.

Change management is the primary tool for companies to connect to their employees and meet their needs when introducing technologies and processes that affect their job functions (Bhattacharyya, 2021). Change management is instrumental to the RPA adoption strategy, ensuring employees are considered throughout its implementation (Abdulla, 2019; Rafferty & Jimmieson, 2017).

This research aimed to identify the activities required for a successful change management approach to RPA implementation. The objectives defined in Chapter 1 were central themes to the research, namely:

1. What change management principles result in successful RPA implementation?
2. What is the correlation and variable strength between change management activities and the outcome of an RPA project?
3. How does change management cater for individuals' personal job considerations?
4. How does change management cater for individuals' social concerns?
5. How does change management cater for individuals' cultural considerations?
6. How is the change management process aligned to the strategic and leadership view of the enterprise, and how was it filtered down to the workforce?
7. How did the change management process ensure that affected employees were prepared to manage the change?
8. What were the success criteria of the automation project?

The discussion of the results in this chapter is representative of the objectives and questions defined by the research proposal. The results have been presented in line

with the outlined themes: (i) outcome measures, (ii) project metrics, (iii) employee involvement, (iv) job considerations, (v) benefits to the organisation, (vi) impact on individual productivity, (vii) change management activities, and (viii) automation readiness.

5.2 SUMMARY OF KEY FINDINGS

The research showed that successful RPA implementations reflect good change management practices. In contrast, RPA implementations that failed to meet the desired goals demonstrated few or poor change management activities.

The change management initiatives adopted by the organisations that reported successful RPA implementations focused on sustainability, adoption, collaboration, preparedness, learning, and company and societal benefits. In the cases that resulted in failed RPA implementations, respondents noted poor change management practices, with limited or no employee involvement, a lack of training and involvement, an absence of consideration of employees' career paths, and a dedicated agenda for immediate internal outcomes.

Successful RPA implementations aimed for the shared success of automation, suggesting a long-term view rather than short-term financial gains. The data revealed that in most cases where the primary aim was short-term benefits, RPA implementations failed to be adopted by organisations and their employees.

Although the author recognises that other factors that fall outside of the scope of this study can influence RPA implementation, change management is the most effective and direct approach for organisations to connect with the workforce and drive adoption initiatives.

5.3 PROJECT APPROACH

Three key topics were analysed:

- What was the aim of the project?
- What areas presented the most difficulty?
- What change management approach was used?

The results of this study demonstrate that projects that focused on organisational

goals were more successful than projects that focused on employee performance. These results are aligned with those presented by Tew (2019), where employees felt more connected and empowered to adopt automation when the aim was aligned to a strategic objective. Projects succeed when the strategic goals of the organisation are aligned to company-wide performance targets such as improving efficiency and reducing operational risks. These goals are widely accepted and not associated with one specific area of an organisation. By introducing automation in broader terms, employees can recognise the value that RPA can bring across the organisation and easily align the benefits of automation to improving manual or repetitive tasks (Juntunen, 2018).

Projects focused on employee cost reduction or reducing dependency on human intervention placed unnecessary pressure on employees to prove their worth, increasing their uncertainty and willingness to adopt automation. As reported by Abdulla (2019), people are more likely to adopt automation if their contributions are considered important to the organisation. RPA aimed, even subliminally, at employee cutbacks will encounter resistance in adoption.

When an organisation introduces automation, there are likely to be some areas of friction. However, an appropriate approach to change management can help smooth the pathway to acceptance and adoption. When change management is implemented effectively, interpersonal challenges are reduced, leaving teams to focus on business processes, technical considerations and delivery against strategic objectives (Ringim et al., 2012). Projects supported by bold change management initiatives rely on good communication, a distinct approach and outcomes, and training of affected users (Lewin, 1947). When these activities meet the needs of affected employees, it allows teams to focus on the most effective delivery of the solution. However, if the change management approach is not well executed, people are left to deal with personalities, managerial decisions, ambiguity and internal barriers.

While successful RPA projects with a bold change management approach listed technology problems as their biggest challenge, for failed RPA projects that showed poor change management activities, the main obstacles were interpersonal problems such as adoption and internal barriers. When change management communication

activities address interpersonal difficulties, there is little room for uncertainty – the entire team knows what it should be doing, and focuses on ensuring that the project is successfully completed (Choi, 2011). Difference in opinion, misalignment and unclear objectives should take priority when trying to deliver on any initiatives. If the people are not aligned and do not know what to do, more time will be spent on resolving internal conflicts than focusing on success (Kotter, 1995).

The data also showed that change management activities that fostered a clear vision and created an environment of internal collaboration resulted in successful RPA implementations. This confirms the findings of Tew (2019) and Juntunen (2018), who reported that the organisation's vision and its reliance on team members created a space of confidence and alignment for successful project delivery. Inversely, projects that focused on how employees were displaced had more difficulty in achieving success. As noted by Choi (2011), when people were more concerned with keeping their jobs, their focus was on demonstrating their singular worth rather than on the overall benefit.

The project approach is an essential element of any change management programme. The change management programme needs to create an environment of participation and trust, and steer clear from any metrics that could affect job security. People need to be included, trained, valued and considered. The clearer the goal, the less energy an organisation will expend on addressing internal alignment and interpersonal differences.

5.4 EMPLOYEE INVOLVEMENT

Currently, RPA is associated with cutbacks in human capital due to its ability to reduce repetitive tasks (McKinsey & Company, 2019). Therefore, the support provided to employees during the implementation of any RPA project is crucial to its success (Juntunen, 2018). The planning and delivery of support activities is a vital step in the change management plan. Employees need to feel engaged and encouraged throughout the process.

Projects with an active element of support and communication allowed employees to understand the outcomes of the automation project. As the project progressed and teams were more involved in the design and delivery of the solution, their confidence

in its end-state improved. Abdulla (2019) emphasised that the communication presented by change management actions became a source of focus for team members.

This research showed that successful projects demonstrated support and communication to the teams involved. Their support allowed teams to feel connected throughout the implementation, creating opportunities for collaboration, idea sharing and active involvement. The research also showed that failed projects caused employees to feel lost and insecure, and compelled to frequently request updates and communications, culminating in uncertainty and an unwillingness to accept automation.

Projects dealing with complex and technical solutions such as RPA often require more training. Kotter (1995) maintained that training is critical to adopting new technologies; it gives affected employees an opportunity to learn while engendering an atmosphere of acceptance. The more known about a subject, the easier it is to observe how an individual may be able to contribute.

The research showed that in-person and classroom training supported by e-learning material were associated with successful RPA projects. In these cases, the individuals were equipped with the necessary materials to understand the technology and had the opportunity to work side by side with the implementation team, allowing them to better understand the technology and RPA solution. Tew (2019) agreed that employees who had received training had a better chance of adopting new technologies.

The research also revealed that failed projects had little inclination to drive a learning agenda. These organisations cited training as unimportant or only presented it ad hoc, depending on the needs identified by management or the technical teams.

Inclusive change management entails preparing individuals for imminent change (Appelbaum et al., 2012) and is critical to how change is adopted. This preparation, or inclusive change management, is achieved through active communication and updates on the status of the change initiative. Active participation in introducing change allows employees to consider themselves part of the change and not just recipients of the change (Kotter, 1995).

The unified theory of acceptance and use of technology (UTAUT) suggests that people (employees) who are actively involved in the change process are more likely to accept the change, as they feel prepared for its implementation (Venkatesh et al., 2003, as cited in Tew, 2019). In the case of RPA, the change is aimed at affecting processes, tasks and, potentially, roles and responsibilities. Allowing teams to feel engaged and involved during this process boosts their sense of preparedness. The findings of this research concerning successful outcomes were consistent with projects that shared the vision at the start of the project, tracked the change throughout and shared regular updates on the implementation of RPA. Conversely, projects that required individuals to seek out information or only allowed communication at general sessions were not successful.

5.5 JOB CONSIDERATIONS

According to the Human Sciences Research Council (HSRC) South African social attitudes survey (2018), job security is a major driver of job satisfaction for South Africans. In a global RPA paper released in 2020, McKinsey & Company pointed out that worker displacement is inherent to RPA. The type of workers displaced is subject to the kind of work performed, their function in the organisation and level of education (McKinsey & Company, 2020).

As RPA is initially introduced as an enabler for repetitive tasks (Oxford Economics, 2019), labour-intensive tasks are the first to be replaced (Toshav-Eichner & Bareket-Bojmel, 2021). Consequently, it is crucial that organisations consider the potential impact of automation on jobs. A fundamental element of the change management process is to analyse the organisation's structure and employees' job functions to understand the impact of automation.

This research showed that companies conducting an analysis of job functions at the start of the automation process experienced successful implementation outcomes, giving employees insights into their job functions and presenting them with a platform to make the change (Davis et al., 1989). Armed with an in-depth knowledge of their current situation and what automation can do, employees were free to plan their careers and transition to new opportunities.

The research also showed that where no analysis was performed, and the displacement of employees would be an outcome of the automation, the process

failed. Such failure can be attributed to employees resisting change because they had little or no input into how automation would shape their careers (Tew, 2019).

Subsequent to the analysis and communication to employees, employers observed that successful automation resulted in the positive displacement of workers due to their willingness to accept new ways of working, career paths and positions (Madden, et al., 1992). Failed automation projects sometimes failed to displace workers – employees held on to their existing positions due to the organisation's inefficiency in managing the changes that automation would bring to people's jobs. It is only through the proper management of these roles that the acceptance of new career paths and adoption of automation will succeed (Juntunen, 2018).

Notwithstanding the results from the questionnaire, some people will resist any form of change, but they are usually in the minority. Change inevitably results in certain losses, as explained by the McKinsey Experience Studio in 2020. However, this should not deter the organisation from adopting automation, as the benefits outweigh the losses and produce overall higher productivity and positive economic output.

An organisation that plans for change will also actively invest in the changing roles and responsibilities (Choi, 2011). Automation projects that have a change management function that considers the impact on roles and responsibilities at the onset enjoy successful outcomes. Companies that focus on the short-term gains of automation and do not consider how employees' careers will be affected are unlikely to succeed.

Job considerations are a critical element of change management practices (Tew, 2019). The more insight employers gather into how careers will be affected, and the more they share that information with the affected individuals, the more successful the automation project will be.

5.6 BENEFITS BEYOND THE ORGANISATION

Automation can have a profound effect on society (McKinsey & Company, 2019) and can bring significant value to ordinary people. In the HSRC's South African social attitudes survey in 2018, 84% of respondents cited adding value to society as an essential aspect of their jobs, while 88% held work that helped others in high esteem (HSRC, 2018).

This research showed that projects affecting areas outside of the organisation are more successful than projects with a solely internal focus. According to Abdulla (2019), projects that open opportunities to people outside the organisation will have a broader adoption base, creating more awareness and demand for ways to improve process efficiency. Similarly, Tew (2019) observed two elements when widening the audience: firstly, it created an expectation that automation would improve how people lived, and secondly, it added pressure internally to complete the automation so that more people could benefit. Both elements generated a subconscious bias to ensure success, as defined by the theory of reasoned action by Davis et al. (1989).

Establishing value in automation outside the organisation heightens awareness and demand within a community that is much larger than the project team, driving the team's desire to adopt automation and reinforcing its need to succeed.

5.7 IMPACT ON INDIVIDUAL PRODUCTIVITY

As automation increases the efficiency of processes, its impact on individual productivity falls under the spotlight. This research explored the importance of preparing teams to adopt automation, identifying the training required, and analysing the benefits arising from accepting automation.

While the questions in the section on job considerations explored the impact of successful or failed automation on displacement and careers, individual productivity explores the type of processes that are more likely to succeed.

Automation aims for process efficiency (McKinsey & Company, 2020); however, the question remains which processes are more likely to succeed. The theory of reasoned action (Davis et al., 1989) asserts that the acceptance of technology change is more likely with a larger audience. Similarly, this research found that automation projects with many individuals that form part of a broader process are more successful than projects targeted at a small direct group of individuals.

This observation was also noted by Tew (2019) and Abdulla (2019) in that the success of automation projects represented processes that culminated in larger ones. Because larger projects involved more people, failure would also have a far-reaching impact, thus encouraging individuals to take ownership of the process and strive for success.

In the case of small-scale processes, there is less incentive or pressure for stakeholders to succeed. Therefore, automation is not driven at a level that would impact the organisation. When the need for success is low, there are internal incentives to maintain the status quo (i.e. the manual process). The net effect is akin to a unified workforce, where no-one wants anyone else to lose their jobs; therefore, maintaining control of the process is the most effective way to remain employed. This view is counterproductive to the success of automation and improving overall welfare.

Tew (2019) and Abdulla (2019) also cited cases where automation aimed at a small group of people proved successful. However, these cases were limited to pilot projects or proof of concepts that measured the automation against strict success criteria. In such instances, a stakeholder with a financial interest in the project was the driving force behind its success. In addition, the research question was aimed more at projects that were already in production and where the organisation had moved past the conceptual automation function.

5.8 CHANGE MANAGEMENT ACTIVITIES

Change management is used to introduce and drive change and is critical to the success of automation initiatives that will profoundly affect many individuals (Vora, 2013). Change management activities associated with successful RPA projects covered several principles in the top 13 change management methodologies (Indeed, 2021), indicating that change management was active and implemented using a structured approach.

For unsuccessful projects, the research found that change management activities fell short in some key areas, including their approach to adoption, addressing cultural needs, redefining roles and responsibilities, and training and development. Although the impact of these activities was evident in the analysis of successful projects, the research showed mixed results when noting areas needing more attention.

The question regarding which change management activities needed more involvement showed a similar dispersion between the successful and failed RPA projects. The research was limited in that it did not investigate why respondents cited the same elements for well-executed change management activities and those that

needed more involvement. They may have had personal reasons, or the organisation at large could have created those perceptions. In addition, the respondents failed to limit their responses to three choices; in several cases, they chose more than three options. As the questionnaire did not have a top three functionality, all responses had to be analysed and weighting was not possible. Consequently, the change management activities that required more focus were also the activities that were reported as successful.

The value of this research is limited to the immediate present; when new RPA technologies are introduced, they will require new change management approaches. Moreover, should this topic be revisited, the researcher recommends structuring the questions so that options are limited and providing space for respondents to explain the reasons for their choices.

5.9 AUTOMATION READINESS

In a report presented by the Economist in 2018, South Africa received an automation readiness index of 41, while the global automation average readiness index was reported at 61. South Africa's score earned it the classification of "emerging" in terms of automation. The report considered several economic, political, social and environmental factors, culminating in the assigned classification. However, given its economic position, market size, and consumption appetite, South Africa is also a favoured destination for several international brands, and the population is considered sufficiently mature and wealthy to make companies profitable (The Economist, 2018). Therefore, the time is right for companies with a presence in South Africa to optimise their processes and create a competitive advantage through new technologies, platforms, customer services and products.

The research showed that organisations that reported successful automation projects were more likely to adopt automation. This is an expected result; success is considered an acceptable platform for continuation until it fails. More importantly, the notion of continuing down the path of success is defined by the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003, as cited in Tew, 2019), which argues that people assume that something is possible because it has already been done. This is where the change management team can play a fundamental role going forward. Companies must manage each project from the

point of view of success, and reset individuals' expectations as if it were the first project.

As companies expect more success from automation projects, costs, urgency and agendas will start to predominate. It is vital that the change management team remains focused on the end-user and not just the desired outcome. For this reason, the change management team must refocus with every project, learn from previous implementations and continue to evolve the change management function to drive adoption, change and acceptance.

5.10 CONCLUSION

The results of the research were aligned with the literature review and the researcher's expectations based on his experience. Successful RPA implementations portrayed the following characteristics:

In terms of the automation approach, the aim of RPA implementation was not to cut costs or reduce human dependency but rather to increase process efficiency and reduce operational risks. Successful projects employed a structure and approach in which the change management functions were more concerned with the technology and systems than interpersonal and administrative hurdles. The change management approach was focused on collaboration and creating a clear end vision.

Concerning employee involvement, change management activities focused on providing support to the affected individuals, providing the right level of training and development, and ensuring that employees were ready for the change. These items empowered and equipped employees to accept and adopt automation.

Understanding the effects of automation on the workforce is fundamental to change management and workers' perceptions when presented with automation initiatives. Successful change management projects focused on identifying how the automation projects would affect the jobs of affected individuals. Analysis of the jobs affected considered the likelihood of worker displacement and its implications for the organisation and employees' careers.

The advantages of successful projects extended beyond the organisation, allowing individuals outside of the company to also benefit. Communicating these outcomes

with employees drove the desire to adopt automation. Successful automation also focused on parts of a project that culminated in a broader process, encouraging greater involvement from stakeholders and commitment to the success of the automation. If an automation project is limited to a small, isolated process, the organisation risks resistance to change. This resistance may stem from fear of displacement, but usually comes at the cost of reduced efficiency.

Successful projects reported a wide range of views concerning the change management activities present during implementation. However, results were inconclusive for change management activities needing improvement. A possible explanation is that all change management activities are essential, and there is always room for improvement, even when a project is considered successful.

Finally, it was expected that companies that reported successful RPA projects also confirmed automation readiness that would see them implement further automation projects. While this expectation is aligned to the literature and strategic vision, the reader needs to understand that the change management function cannot be compromised to speed up a project that would fundamentally affect so many individuals. Change management needs to be executed thoroughly and to the best of the change management team’s ability to ensure that employees are adequately prepared, trained, supported and managed throughout the implementation.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

In this chapter, the results of the research are presented in relation to the research problem and objectives. The chapter also discusses recommendations for additional research arising from the findings.

6.2 SUMMARY OF FINDINGS

The aim of the study was to determine the requirements for delivering successful robotic process automation (RPA) projects in South Africa. Several questions were posed to investigate the functions required of change management teams to achieve a successful RPA implementation. The researcher linked these questions to the research objectives and has summarised the findings for each objective in the sub-sections below.

6.2.1 Change management principles to be considered

Change management requires several functions to induce change in an organisation. With the introduction of RPA technology in an employee-charged climate such as South Africa's, companies need to balance the benefits of automation and employees' concerns when introducing technology that could potentially reduce employment.

The function of the change management process is to ensure adoption and acceptance through transparency, facts, support and welfare development. The change management methodologies discussed in Chapter 2 focus on the following key areas (Indeed, 2021):

- Staff and management alignment are essential to ensure the project outcomes support its goals and strategy. Strategy alignment should not only be limited to financial or operational goals but must also include employee career paths and personal support. The change management team must ensure that this alignment is at the centre of the project and constantly reinforce it throughout RPA implementation.

- Tracking success will ensure that milestones are shared with the project team and the organisation. The shared successes aim to give context to the solution and encourage other business areas to consider the adoption of RPA (or any technology) by building trust in the working process.
- Culture definition seeks to understand how individuals are personally affected by change. As organisations expand across geographies, acknowledging individual cultures becomes a core change management principle in positioning and driving the adoption of new technology. The more aligned the change is with individuals' beliefs, the higher the adoption rate. Therefore, the change management team needs to invest time in understanding what is important to employees. It must develop a cultural alignment plan to establish an alliance between people and technology that supports individuals' needs and the adoption process.
- Employee change support is aimed at motivating employees during the change process. Support can be provided through training and development, learning sessions, management sharing, and addressing concerns and risks. The more employees are supported, the more they will feel a personal connection with the project, thereby deepening their desire for success. Support can also lead to employees developing a sense of pride in a project, driving adoption and serving as change agents for other parts of the business.
- Process alignment serves as the bridge between technology and business operations. Introducing any technology without aligning it to the operation's processes will result in failure. Process alignment connects the maturity of the process with its operational dependency and human interaction. The more readily technology aligns to those elements, the more likely the process will be to adopt a new technology platform.
- Organisational structure refers to the impact of technology on the organisation's hierarchical structure. The success or failure of the automation of a process depends on its ability to overcome various structural challenges:
    - If the process is multi-layered, it requires a strong project sponsor to ensure the success of its adoption.
    - If the organisational structure is flat, the project requires involvement from all team members to drive adoption and acceptance.

    - If the structure is centralised, the project requires a mature view to prioritise the team's needs and support implementation.
    - If the structure is decentralised, it requires a focused development team to manage the implementation, change and adoption at a detailed operational level.

- Resistance management is an essential function of the change management team. Any technology change will result in resistance from some individuals; it is up to the change management team to address these uncertainties. Activities such as training, process support, communications, process alignment and one-on-one sessions help to address individuals' concerns and reduce the friction that resistance can cause. To manage resistance, the management team must drive open and honest communication.
- Automation projects aim to reduce the manual operations employees perform, which will result in a change in their roles and responsibilities. The impact of automation on individuals must be considered very early in the introduction of the project. Therefore, redesigning roles and responsibilities is a key step to ensuring that affected individuals take centre stage during a change process. The faster these steps in the process are communicated, the more confidence employees will have in the organisation, management, the technology, their career planning, and the project's success.
- Leadership alignment is aimed at ensuring that leaders, as people, are also personally involved in the change management process. Leaders play a vital role in driving adoption – the closer they are to the affected individuals; the more confidence employees will have in the project. When leadership is personally vested in a project's success, it allays employees' doubts and fears of alienation from the rest of the organisation.
- Project scale is a determining factor for success. The research showed that projects culminating in broader processes are more likely to succeed as the demand for their success is higher. Conversely, processes that act in isolation or are not part of a broader entity are more likely to lose momentum and fail. The company needs to strike a delicate balance between the goals of the project team and those of the change management team. Acknowledging the multiplier effect of technology will result in higher adoption rates across the organisation.

- Project communication is critical to ensure all involved parties remain aligned and honest with each other. The communication must be bidirectional, flowing from both the development team and the process team: the development team must share information about the technical alignment to the operational processes, highlighting benefits, values, and outcomes; the process team must share details of the process, key success measures and concerns they envisage the automation will raise. Communication from the change management team must also include companywide communications, successes, milestones, alignment to the strategy, project updates and challenges, and key project dates.
- Project management is determined through the management of the flow of information between the process and development team and forms part of the change management team's communication plan. Although project management includes managing the project's development from a delivery perspective, it should not be concerned with successful delivery alone. It should also consider how the design of the solution meets the requirements of the process it is replacing. The change management team and the project management team must work together in ensuring that the communication and outcome meet the end-user's needs.

6.2.2 The importance of change management

The research indicated a strong correlation between change management activities performed in alignment with the RPA project objectives and successful outcomes. The study also showed that change management plays a role across several areas. Not only are these activities expected to be managed throughout the project, but they must also be implemented at different intensities and at different stages of the project.

The role of the change management team is critical to ensure that employees, stakeholders, developers, and business areas are aligned and kept in constant communication. Not only is change management considered a catalyst for successful project implementation, but it also plays a role in replicating the outcome across an organisation. Therefore, change management is an overarching function that serves as a platform for an organisation to meet its strategic goals through the different activities for delivering a sustainable, adoptable and adaptive solution.

6.2.3 The importance of considering workers' job concerns

The research showed that consideration of the impact on employees' job concerns must be addressed at the onset of the project. Before RPA development starts, the potential impact on individuals must be analysed. The analysis will support the change process by addressing which areas of concern to prioritise. If the automation is going to displace individuals because of the function it will replace, then training and support are required; if the automation is going to enhance functions, then development and training are crucial.

People are at the centre of the change management strategy, and the level of human engagement is a determining factor in adopting any technology. Therefore, the change management team must ensure that jobs are preserved and opportunities created because other business areas will notice the effects of automation on employees. This will determine how well automation is likely to be adopted in other areas of the organisation.

6.2.4 RPA projects should benefit society

The research showed that successful RPA projects are associated with projects affecting individuals outside of the organisation. As shown in the South African social attitudes survey conducted by the Human Sciences Research Council (HSRC), helping others is an important job attribute. In the case of RPA, this translates into delivering benefits to employees outside of the organisation (HSRC, 2018).

The South African worker culture prides itself in the sense of Ubuntu – I am because you are – which shows genuine concern for the welfare of others. The more this concept reflects across an organisation's projects, the more it will drive employees to ensure project success so that more people may benefit from RPA.

The change management function must position the benefits of automation to reach outside stakeholders. It will allow companies to explore new avenues of how to interact with communities that support their survival. The proliferation of technology must be analysed at the start of the project and the outcome aligned to social benefits.

6.2.5 The importance of social considerations

Similar to social considerations, the change management function must also consider how individuals will react to the implementation of different technologies. South African culture comprises a broad spectrum of individuals, encompassing a multitude of workers. RPA will affect individuals' identities, their jobs and their social standing. A project's success will be determined by how people are affected, not only in terms of their jobs but also in the way they are affected personally.

Cultural beliefs include communication, respectfulness, individuality, social standing, opportunities and community impact. The change management team must explore these elements at the onset and establish a plan to engage with employees and meet their needs.

6.2.6 Including strategy in change management

A central aspect of change management is communicating the project to recipients. The communication channel, tone, content and message are essential to ensuring that employees are aligned and involved.

As part of this process, leadership's view, concerns, excitement, drive, and alignment to strategic objectives must be shared. Employees look to leaders for guidance, inspiration and a sense of confidence. The change management team must encourage ongoing direct communication between the leadership team and employees. They can achieve this by engaging with people in informal and, where possible, one-on-one settings, scheduling regular catchups, and even providing written communication about how the project is aligned to the strategic objectives.

Automation should not be viewed as a strategic initiative but rather as a tool supporting the organisation in delivering on its strategic objectives. This distinction must be made clear by leadership when communicating with employees. An example is that if an RPA project will displace workers, they must not interpret it as a strategic objective. Instead, the envisaged outcome of the operational change must be aligned with the strategic objective and not with the displacement of workers.

As the change management team creates the channels between the leadership team and the end-users, the strategic objectives must shine through as they will drive a sense of ownership, adoption and acceptance.

6.2.7 Preparing employees for change

Preparing employees for a change in how they perform their functions must become a focus of the change management function. During the initial stages of the project, the change that will affect employees has to be identified and a displacement or supportive preparation plan completed.

The sooner it is implemented, the more quickly relevant feedback can be gathered from the affected group, allowing the change management team to adapt the strategy and include elements that meet the employee's requirements.

By understanding the change that employees will go through, and delivering the change management functions, e.g. communication, strategic alignment, job protection, changes in roles and responsibilities, involvement in the design and development phase, employees are prepared and empowered to embrace the change. The preparation element is the result of a combination of change management activities. The closer the change management team is to the affected population, the easier it becomes to add (or remove) elements of the change plan and tailor an approach to meet affected employees' needs.

6.2.8 Criteria for successful RPA implementations

The research showed a strong correlation between change management practices and successful RPA implementations. The adoption of RPA, or any new technology, hinges on individuals' willingness to change. Although change management creates a framework and a set of activities to support this adoption, the extent of completion of these activities will determine whether the change management team has been able to reach the end-users.

The change management team's experience, types of communication, type of training, level of preparation and support are the building blocks of effective change management. However, it is how those elements are pieced together that will determine the success of the adoption of new technology.

The goal of the change management team is to connect with employees at a personal level. Employees need to feel engaged and supported throughout the process. The rate at which new technology is introduced is central to its adoption. However, the change management team must understand that not everyone is prepared to adopt new technology.

6.3 LIMITATIONS OF THE STUDY

Some participants did not adhere to the instructions in the questions, particularly those that required them to select more than one answer. Owing to a flaw in the technology used (Microsoft Forms), respondents could either select one option or all the options. This caused complications when analysing the data as it necessitated widening the scope of data analysis to cater for all responses.

Some comments received from participants suggested that certain answer options were not relevant as the projects implemented were designed to meet different business criteria. There was little consideration of the financial aspect of the projects, which would have been a major business driver (although this was discussed with participants as a criterion that would not be included). The time to complete the project proved to be a deterrent to adoption, and changes in internal structures prevented some processes from being completed due to a change in strategic direction.

6.4 RECOMMENDATIONS FOR FURTHER RESEARCH

As RPA projects grow across companies and change management activities are constantly being designed to promote the adoption of new technologies, it is recommended that this study be conducted again in a few years' time. This will give time for the market to adopt other RPA processes, providing more experience for responding to the questions.

The researcher recommends that future studies conduct separate analyses for the companies implementing RPA and the consulting firms implementing the solutions. This will allow the research to identify the different aspects of the implementation and give the change management function a comprehensive view of the challenges that consulting firms face when implementing RPA solutions.

This study was limited to the project team members, focusing specifically on the management teams and change management professionals. This group was selected as they would have been directly involved with the outcome of the project. However, including development experts, business process owners, process members, and HR practitioners would provide keener insights into the implementation of RPA solutions. It is also recommended that the participant group

be expanded to include displaced employees or employees who were made redundant because of automation.

It was also noted that due to some of the questions being presented as multiple choice, there was no room for the participants to provide additional comments, or express individual views that were not presented as options. Therefore, it is recommended that future research includes a qualitative analysis on the direct experience of the respondents.

6.5 CONCLUSION

The adoption of RPA projects is becoming a priority for many companies. This research has identified some change management functions linked to successful project outcomes. However, there are other internal forces at play that will force the adoption of RPA. The author has personally experienced the push of financial benefits. Such pressures can consume ideologies and change management activities, almost compelling the adoption of RPA technology. Companies need to address these notions and reduce the association of financial gains with RPA adoption. By considering the end-user and how they will be affected, they can avert resistance, thereby encouraging the adoption of automation across the organisation.

This research includes several points made from similar papers on the implementation of RPA projects. Although change management was discussed, it was not the main driver for the adoption of RPA. However, the author hopes that change management teams will realise the association between project success and the support they can offer organisations wishing to adopt RPA.

CHAPTER 7: CHANGE MANAGEMENT PLAN

The change management plan outlined in this chapter was designed to combine the research outcomes into a guideline for employers to focus their efforts on using a structured approach to change management.

Robotic process automation (RPA) projects usually follow the solution development life cycle (SDLC), an implementation approach aimed at separating project delivery into phases and activities (see example in Figure 7.1).

The SDLC has become the standard project management approach when developing technology solutions because it caters for a phased approach, rapid deployment, and post-implementation support and enhancements. When developing the change management plan, it is necessary to refer to the SDLC to align change management activities with the project development phases.

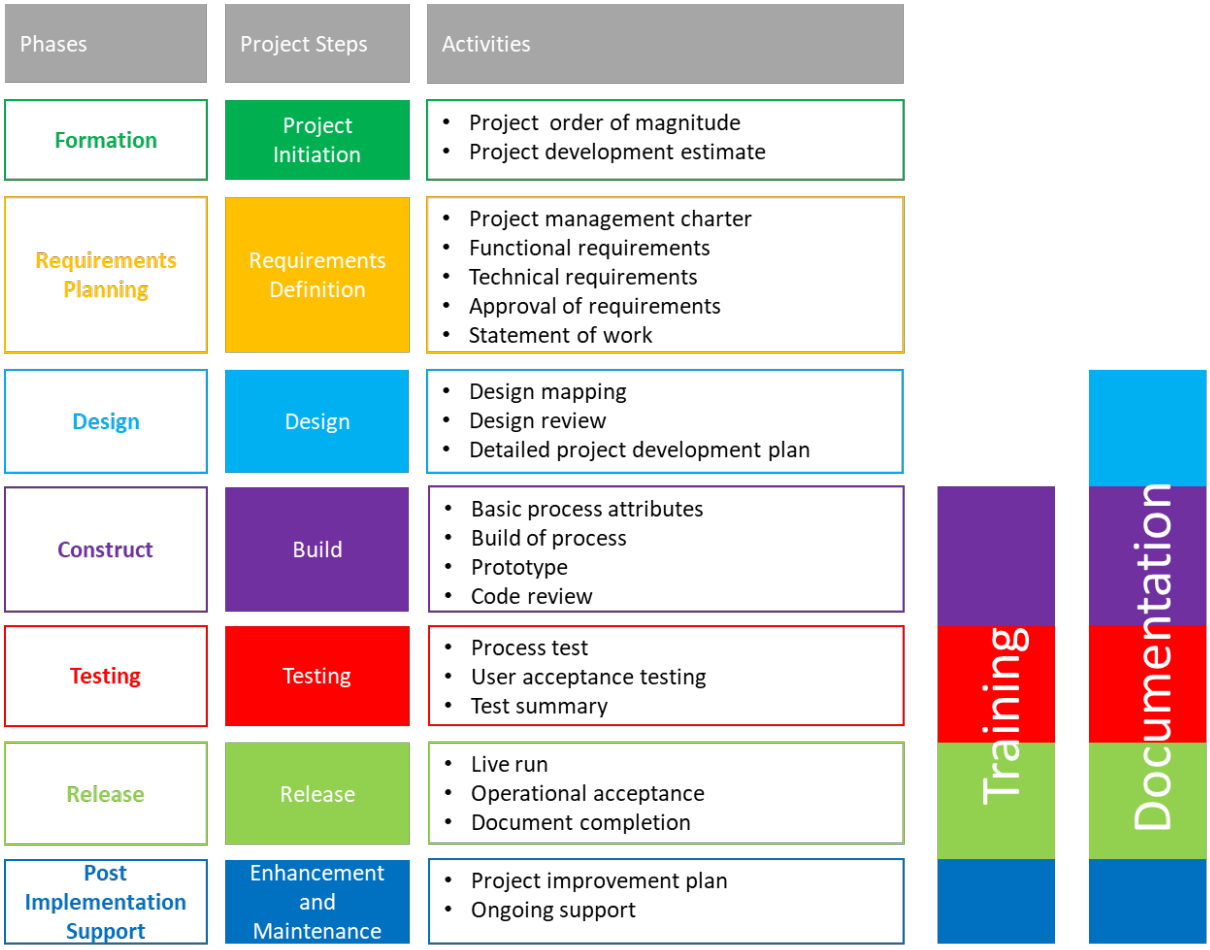


Figure 7.1: Solution development life cycle (SDLC) phases
Source: https://phoenixnap.com/blog/software-development-life-cycle

In addition to the SDLC, the responsibility assignment (RACI) matrix (defined in Figure 7.2) was developed to identify the involvement of the relevant stakeholders in a project. Change management teams can use the RACI matrix to assign actions to specific teams. The proposed RPA change management plan will rely on the contribution and involvement of different individuals to ensure effective implementation.

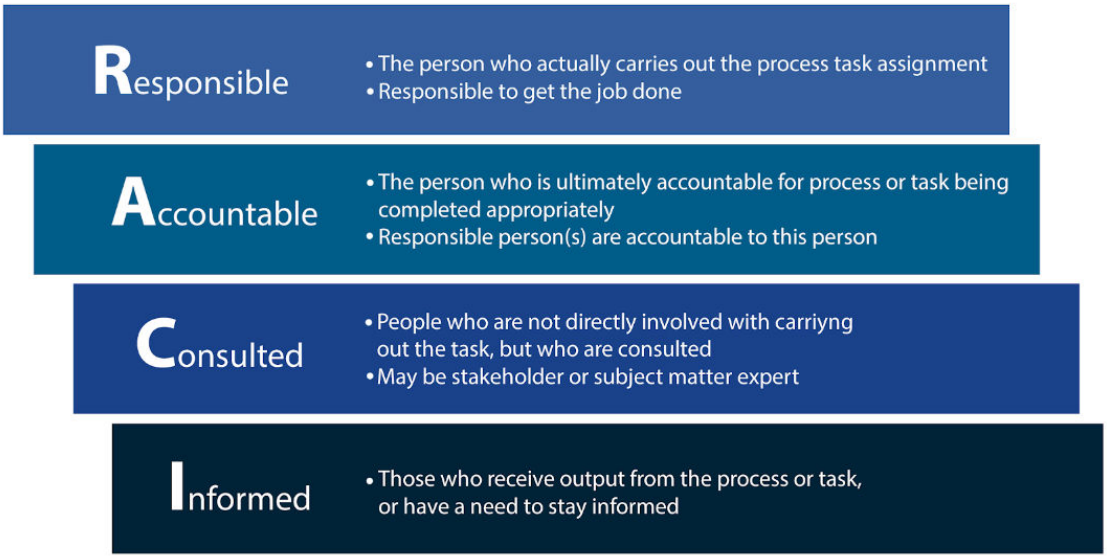


Figure 7.2: RACI categories defined
Source: https://project-management.com/understanding-responsibility-assignment-matrix-raci-matrix/

Both the SDLC and the RACI matrix are used to identify the project phases and activities, which must be aligned to the RPA change management plan (Figure 7.3).

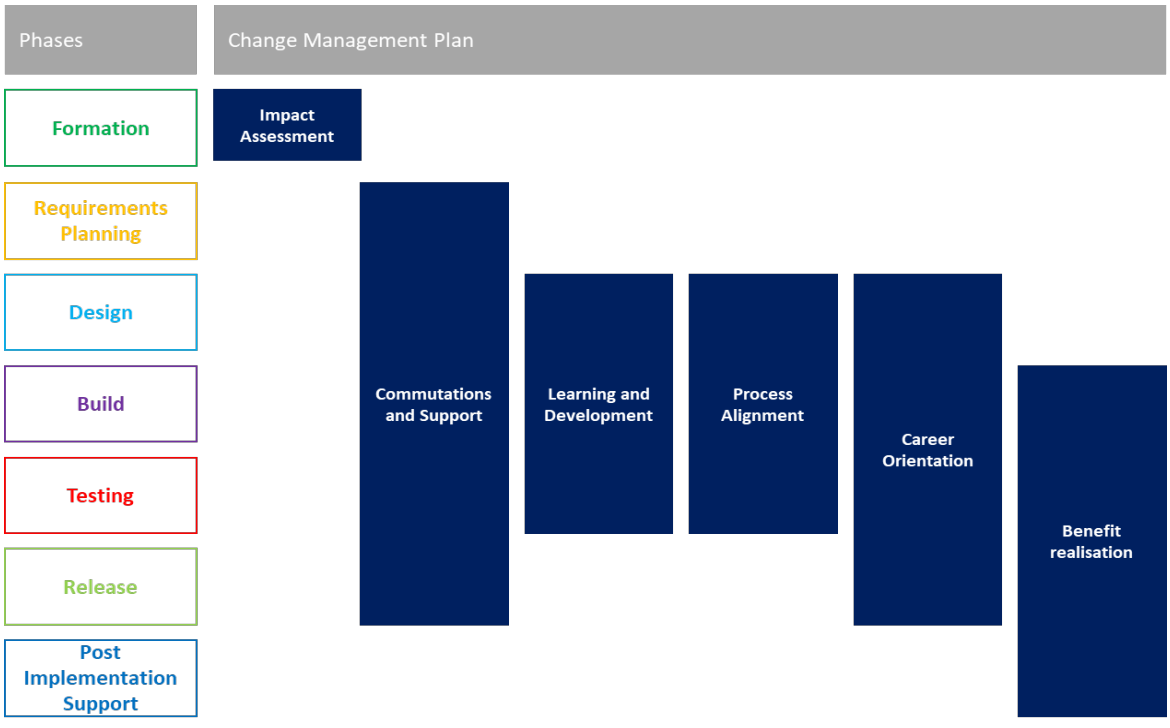


Figure 7.3: Change management plan

The change management plan must be aligned to the SDLC. The various project phases will indicate at which stage the change activities must be deployed.

The tables below outline the change management plan based on the different SDLC activities and identify the relevant roles and responsibilities of stakeholders tasked with carrying out specific functions.

Table 7.1: Change management phase 1: impact assessment

SDLC Phase	Formation		
Change management objective	The change management team must work with the management team to understand the impact that the automation will have on the business and its employees. The strategic intent of RPA must be clearly defined during this phase as it will serve as the central message promoting the implementation of the RPA solution. Key metrics such as timelines, budgets, expected results, key stakeholders, and impact to employees are defined in this phase.		
SDLC phase start	Formation		
SDLC phase end	Formation		
Change management activities	• Position the project with management and employees • Develop communication plan • Develop employee support plan • Develop career framework • Understand cultural impacts of proposed RPA • Identify affected employees • RPA impact assessment and employee change readiness		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
Change management	Change management and management	Development team HR	Management and employees
Supporting artefacts	• Project charter • Change management plan • Employee support plan • Employee roles and responsibilities matrix • Career management framework • Employee readiness assessment		

Table 7.2: Change management phase 2: communication and support

SDLC Phase	Requirements planning		
Change management objective	To communicate with the affected employees the impact of the project. The support and training that will be presented is critical to the success of this phase. During this phase, the support intent and framework must be designed, covering all aspects of employee concerns, planned changes, cultural impact, and support mechanisms.		
SDLC phase start	Requirements planning		
SDLC phase end	Release		
Change management activities	• Implement plan and channels • Implement support function with appropriate individuals • Design training plan • Identify training material • Develop training library • Set up training sessions • Communicate RPA intent to organisation • Identify affected individuals		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
Change management HR	Change management HR Management	Development team External facilitators	Employees
Supporting artefacts	• Sample communication documents • Training plan • Training syllabus • Calendar of training sessions with relevant employees • Presentation to broader organisation		

Table 7.3: Change management phase 3: learning and development

SDLC Phase	Design		
Change management objective	Implement the learning plan, track the participation and involvement of the employees and measure the success of the training being delivered. During this phase, the change management team can also take the opportunity to gather ideas of where automation can play a role in other parts of the business.		
SDLC phase start	Design		
SDLC phase end	Testing		
Change management activities	• Implement training schedule • Document training material • Schedule feedback sessions • Create facilitator feedback channels • Develop case studies library • Implement idea generation hub • Enforce continuous communication		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
Change management Learning team	Change management Employees Management	Management HR	Management
Supporting artefacts	• Training schedule • Materials library • Feedback forms • Idea generation hub platform		

Table 7.4: Change management phase 4: process alignment

SDLC Phase	Design		
Change management objective	The development of the solution must be aligned to the existing processes. It is important for the users to have participated in the development of the solution in order to share ideas, challenges and lessons learnt. Without the collaboration from the process team, the development team will struggle to build a solution that meets all business requirements.		
SDLC phase start	Design		
SDLC phase end	Testing		
Change management activities	• Development and process team collaboration sessions • Introduction of the process team to the technology functionality and limitations • Employee collaboration must be documented and presented to the development team as input to the design • Process improvement plans • Process lessons and challenges • Employee roles and responsibilities need to be matched to the system functionality		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
Change management Process team Development team	Project management Change management	Management Employees Development team	Management
Supporting Artefacts	• Process development documents • Technical training material • Process improvement plan • Roles and responsibilities matrix • Solution functional alignment		

Table 7.5: Change management phase 5: career orientation

SDLC Phase	Design		
Change management objective	During the design phase, the impact of the automation process must be set out to identify how process members are going to be affected. This phase is critical to see which employees will be displaced or have changes made to their current functions. The role of the employee is at the centre of this phase, and it is imperative that the change management team consults with the relevant business stakeholders to identify the areas that can accommodate displaced workers based on their skills and experience.		
SDLC phase start	Design		
SDLC phase end	Release		
Change management activities	• The job impact assessment must be formulated and completed with all relevant information • HR must identify the growth strategy of the company matched against the job requirements and what job vacancies are in the market • HR must update the skills and experience of the affected employees and develop a training plan (if required) to absorb the employees into other areas • This activity must be performed in collaboration with the employees to ensure that their needs are constantly being met		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
HR	Change management	Management	Employees
Supporting artefacts	• Career framework • Training plan • Employee skills matrix • Vacancies report • Department staffing requirements • Roles and responsibilities • Individual development framework		

Table 7.6: Change management phase 6: benefits realisation

SDLC Phase	Construct		
Change management objective	Link the value of the project to users outside of the organisation, although some of these elements have been identified at the start of the change management process. During the benefits realisation phase, the case study highlighting external user adoption and benefits must be defined, documented and communicated to external users. The change management team must also communicate these benefits internally to further drive the adoption of RPA across the organisation.		
SDLC phase start	Construct		
SDLC phase end	Post-implementation support		
Change management activities	• Benefits realisation plan to be completed by the internal development and process owners • Advertising plan (if required) completed by the marketing team • Global case studies presented by the development team • Management must explore the impact of external users, risks, costs, exposure, legality (POPIA), functional requirements and new processes		
Responsible persons RACI			
Responsible	Accountable	Consulted	Informed
Change management Management	Development team Marketing team Process owners	Management Employees	Other business functions Employees
Supporting artefacts	• External benefits assessment • Global case study library • Presentation to the rest of the organisation • Advertising plan (if required)		

The change management plan presented above can be tailored to organisations attempting RPA projects. Although not all the elements are necessary, they are recommended as part of the results of the research. Identifying the areas employed is at the user's discretion.

REFERENCES

Abdulla, N. M. (2019). *Adoption of job automation technologies in the fourth industrial revolution: A managerial perspective.* (Master's dissertation, Gordon Institute of Business Science, Johannesburg).

Accenture Consulting. (2018). *Creating South Africa's future workforce.* Accenture Research. Retrieved June 8, 2021, from https://www.accenture.com/t20180201T173907Z__w__/za-en/_acnmedia/PDF-70/Accenture-Creating-South-Africa-Future-Workforce.pdfla=en

Addis, M., & Podestà, S. (2005). Long life to marketing research: A postmodern view. *European Journal of Marketing, 39*(3/4), 386-412. https://doi.org/10.1108/03090560510581836.

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research, 9*(2), 204-215. https://doi.org/10.1287/isre.9.2.204.

Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research.* Reading. MA: Addison-Wesley.

Allen, L. (2021, December 14). *Intelligent process automation: How did we get here?* Retrieved from ITWeb: https://www.itweb.co.za/content/wbrpOMgY3WmvDLZn

Appelbaum, S. H., Habashy, S., Malo, J.-L., & Shafiq, H. (2012). Back to the future: revisiting Kotter's 1996 change model. *Journal of Management Development, 31*(8), 764-782. https://doi.org/10.1108/02621711211253231.

Arntz, M., Gregory, T., & Zierahn, U. (2016). The risk of automation for jobs in OECD countries: A comparative analysis. *OECD Social, Employment and Migration Working Papers, No. 189*, OECD Publishing, Paris. https://doi.org/10.1787/5jlz9h56dvq7-en.

Bell, J. (2005). *Doing your research project* (4th ed.). Berkshire: Open University Press.

Bhattacharyya, S. S. (2021). Adoption and implementation of automation technologies in organizations and community job-loss; corporate social responsibility managers justification mechanism among social actors. *Foresight, 23*(5), 564-582. https://doi.org/10.1108/FS-09-2020-0096.

Brown, A. S. (2015, June). Work buddies. *Mechanical Engineering, 137*(6), pp. 38-43. https://doi.org/10.1115/1.2015-Jun-2.

Bulmer, M. G. (1979). *Principles of statistics* (2nd ed.). New York: Dover.

Burke, R. J., Graham, J., & Smith, F. J. (2005). Putting the customer second. *The TQM Magazine, 17*(1), 85-91. https://doi.org/10.1108/09544780510573075.

BusinessTech. (2019, September 15). 10 tasks which are being automated at South African companies. *BusinessTech*. Retrieved from https://businesstech.co.za/news/technology/340249/10-tasks-which-are-being-automated-at-south-african-companies/

Choi, M. (2011). Employees' attitudes toward organizational change: A literature review. *Human Resource Management, 50*(4), 479-500. https://doi.org/10.1002/hrm.20434.

Cooper, R. B., & Zmud, R. W. (1990). Information technology implementation research: A technological diffusion approach. *Management Science, 36*(2), 123-246. https://doi.org/10.1287/mnsc.36.2.123.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles, CA: SAGE Publications.

Damanpour, F., & Schneider, M. (2006). Phases of the adoption of innovation in organizations: Effects of environment, organization and top managers,. *British Journal of Management, 17*(3), 215-236. https://doi.org/10.1111/j.1467-8551.2006.00498.x.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 903-1028. https://doi.org/10.1287/mnsc.35.8.982.

de Vaus, D. (2001). *Research design in social research.* London: SAGE Publications.

DeCarlo, L. T. (1997). On the meaning and use of kurtosis. *Psychological Methods, 2*(3), 292–307. https://doi.org/10.1037/1082-989X.2.3.292.

EY. (2021). *How process automation enables businesses to service varying customer demands.* Retrieved from https://www.ey.com/en_za/customer/how-process-automation-enables-businesses-to-service-varying-cus

Fitzsimmons, J. (1994). Information technology and the third industrial revolution. *The Electronic Library, 12*(5), 295-297. https://doi.org/10.1108/eb045307.

Fleming, S. (2020, September 3). *A short history of jobs and automation.* Retrieved from World Economic Forum: https://www.weforum.org/agenda/2020/09/short-history-jobs-automation/

Frambach, R. T., & Schillewaert, N. (2002). Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research. *Journal of Business Research, 55*, 163-176. https://doi.org/10.1016/S0148-2963(00)00152-1.

Gartner. (2021). *Robotic process automation software reviews and ratings.* Retrieved from Gartner Peer Insights: https://www.gartner.com/reviews/market/robotic-process-automation-software

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference* (4th ed.). Boston, MA: Allyn & Bacon.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyrikidou, O. (2004). Diffusion of Innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly, 82*(4), 581-629. 0.1111/j.0887-378X.2004.00325.x.

Hillman Willis, T., & Willis-Brown, A. H. (2002). Extending the value of ERP. *Industrial Management & Data Systems, 102*(1), 35-38. https://doi.org/10.1108/02635570210414640.

Holt, D. T., Armenakis, A. A., Feild, H. S., & Harris, S. G. (2007). Readiness for organizational change: The systematic development of a scale. *The Journal of Applied Behavioral Science, 43*(2), 232-255. https://doi.org/10.1177/0021886306295295.

HSRC. (2018). *South African social attitudes survey (SASAS).* Pretoria: Human Sciences Research Council. Retrieved from http://dx.doi.org/doi:10.14749/1575000020

IBM Watson. (2021). *Global AI adoption index 2021.* New York, NY: IBM & Morning Consult.

Indeed. (2021, May 27). *Change management methodology: 13 methodologies to manage change.* Retrieved from Indeed: https://www.indeed.com/career-advice/career-development/change-management-methodology

Juntunen, K. (2018). *Influence of contextual factors on the adoption process of robotic process automation (RPA): Case study at Stora Enso Finance Delivery.* (Master's thesis, Uppsala Universiteit, Uppsala, Sweden).

Kim, T. (2015). Diffusion of changes in organizations. *Journal of Organizational Change Management, 28*(1), 134-152. https://doi.org/10.1108/JOCM-04-2014-0081.

Kotter, J. P. (1995, May-June). Leading change: Why transformation efforts fail. *Harvard Business Review*. Retrieved from https://hbr.org/1995/05/leading-change-why-transformation-efforts-fail-2

Lacity, M., Willcocks, L., & Craig, A. (2015a). *Robotic process automation at Telefónica O2 - Paper 15/02.* St Louis, MO: The Outsourcing Unit Working Research Paper Series. Retrieved from https://www.umsl.edu/~lacitym/TelefonicaOUWP022015FINAL.pdf

Lacity, M., Willcocks, L., & Craig, A. (2015b). *The IT function and robotic process automation - Paper 15/05.* St Louis, MO: The Outsourcing Unit Working Research Paper Series. Retrieved from http://eprints.lse.ac.uk/64519/1/OUWRPS_15_05_published.pdf

Law, R. (2015). *Developing a strategy for the mass adoption of a medical emergency identification system in China.* (Master's dissertation, Regenesys Business School, Sandton).

Leavy, B. (2015). Continuous innovation: Unleashing and harnessing the creative energies of a willing and able community. *Strategy & Leadership, 43*(5), 24-31. https://doi.org/10.1108/SL-06-2015-0051.

Leedy, P. D., & Ormrod, J. E. (2010). *Practical research: Planning and design* (9th ed.). Upper Saddle River, NJ: Pearson Education.

Lewin, K. (1947). Frontiers in group dynamics: Concept, method and reality in social science; social equilibria and social change. *Human Relations, 1*(1), 5-41. https://doi.org/10.1177/001872674700100103.

Madden, T. J., Ellen, P. S., & Ajzen, I. (1992). A comparison of the theory of planned behavior and the theory of reasoned action. *Personality and Social Psychology Bulletin, 18*(1), 3-9. https://doi.org/10.1177/0146167292181001.

Maree, K. (2019). *First steps in research* (3rd ed.). Pretoria: Van Schaik.

McKinsey & Company. (2019). *The future of work in South Africa: Digitisation, productivity and job creation.* Sandton: McKinsey & Company.

McKinsey & Company. (2020). *The imperatives for automation success.* New York, NY: McKinsey & Company. Retrieved January 28, 2022, from https://www.mckinsey.com/business-functions/operations/our-insights/the-imperatives-for-automation-success

Mncwango, B., & Winnaar, L. (2009). South Africans at work: How satisfied are we? *HSRC Review, 7*(3), 10-11. http://hdl.handle.net/20.500.11910/4613.

Morgan, J. (2014). *The future of work: Attract new talent, build better leaders, and create a competitive organization.* Hoboken, NJ: John Wiley & Sons.

Mseleku, Z. (2021). Youth high unemployment/unemployability in South Africa: The unemployed graduates' perspectives. *Higher Education, Skills and Work-Based Learning, Ahead-of-print*, https://doi.org/10.1108/HESWBL-06-2021-0114.

Muller, J. (2018, April 13). Elon Musk cops to overpromising on automation, then hikes targets for Model 3 and profits. *Forbes*. Retrieved from Forbes: https://www.forbes.com/sites/joannmuller/2018/04/13/elon-musk-scraps-automation-that-slowed-tesla-output-then-hikes-targets-for-model-3-and-profits/?sh=591b9f1342b5

Nangolo, C., & Musingwini, C. (2011). Empirical correlation of mineral commodity prices with exchange-traded mining stock prices. *Journal of the Southern African Institute of Mining and Metallurgy, 111*(7), 459-468.

Nwaohiri, N. M., & Nwosu, M. C. (2021). Reskilling the library workforce for the fourth industrial revolution. In J. P. Chingwada, & N. M. Nwaohiri (Eds.), *Examining the impact of industry 4.0 on academic libraries* (pp. 227-233). Bingley: Emerald Insight. https://doi.org/10.1108/9781800436565.

Olsen, C., & St. George, D. M. (2004). *Cross-sectional study design and data analysis.* New York, NY: College Entrance Examination Board. Retrieved from http://cdn.physioblasts.org/f/public/1355667773_1_FT0_4297_module_05.pdf

Oxford Economics. (2019, June 26). *How robots change the world.* Retrieved from https://www.oxfordeconomics.com/resource/how-robots-change-the-world/

Oxford University Press. (2016). *Dictionary.* Oxford: Oxford University Press. Retrieved from http://oxforddictionaries.com

Parschau, C., & Hauge, J. (2020). Is automation stealing manufacturing jobs? Evidence from South Africa's apparel industry. *Geoforum, 115*(In press), https://doi.org/10.1016/j.geoforum.2020.07.002.

Piderit, S. K. (2000). Rethinking resistance and recognizing ambivalence: Multidimensional view of attitudes toward an organizational change. *Academy of Management Review, 25*(4), 783-794. https://doi.org/10.5465/AMR.2000.3707722.

Rafferty, A. E., & Jimmieson, N. L. (2017). Subjective perceptions of organizational change and employee resistance to change: Direct and mediated relationships with employee well-being. *British Journal of Management, 28*(2), 248-264. https://doi.org/10.1111/1467-8551.12200.

Ringim, K. J., Razalli, M. R., & Hasnan, N. (2012). Critical success factors for business process management for small and medium banks in Nigeria. *Business and Management Review, 2*(1), 83-91.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). New York, NY: Free Press.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow: Pearson Education.

Schein, E. H. (1992). *How can organizations learn faster? The problems of entering the green room.* Cambridge, MA: MIT Sloan Management Review. Retrieved from https://dspace.mit.edu/bitstream/handle/1721.1/2399/SWP-3409-45882883.pdf

Schwab, K. (2016, January 14). *The fourth industrial revolution: What it means, how to respond.* Retrieved January 30, 2022, from World Economic Forum: https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Shin, W. S., & Kim, C. (2015). Samsung's journey to excellence in quality. *International Journal of Quality and Service Sciences, 7*(2/3), 312-320. doi:10.1108/IJQSS-03-2015-0036

Sincero, S. M. (2012, October 16). *Online surveys.* Retrieved January 8, 2022, from Explorable: https://explorable.com/online-surveys

Spathis, C., & Constantinides, S. (2003). The usefulness of ERP systems for effective management. *Industrial Management & Data Systems, 103*(9), 677-685. Retrieved from https://www.academia.edu/714318/The_usefulness_of_ERP_systems_for_effective_management

Stats SA. (2021). *Quarterly labour force survey: Quarter 3 2021.* Pretoria: Statistics South Africa.

Straub, E. T. (2009). Understanding technology adoption: Theory and future directions for informal learning. *Review of Educational Research, 79*(2), 625-649. https://doi.org/10.3102/0034654308325896.

Survio. (2013, November 28). *Online surveys and their advantages/disadvantages.* Retrieved from Survio.com: http://www.survio.com/en/blog/popularseries/online-surveys-and-their-advantages-disadvantages#.VObAjflh8gQ

Tew, M. (2019). *Investigating the factors driving adoption of RPA in South African banking: A qualitative analysis.* (Master's thesis, University of Cape Town, South Africa).

The Economist. (2018). *The automation readiness index: Who is ready for the coming wave of automation?* London: The Economist Intelligence Unit.

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management, 29*(1), 28-45. https://doi.org/10.1109/TEM.1982.6447463.

Toshav-Eichner, N., & Bareket-Bojmel, L. (2021). Yesterday's workers in tomorrow's world. *Personnel Review, Ahead-of-print*, https://doi.org/10.1108/PR-02-2020-0088.

UiPath. (2022). *UiPath Platform.* Retrieved from https://www.uipath.com/product

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926.

Vora, M. K. (2013). Business excellence through sustainable change management. *The TQM Journal, 25*(6), 625-640. https://doi.org/10.1108/TQM-07-2013-0080.

APPENDICES

APPENDIX A: SURVEY QUESTIONNAIRE

The Impact of Change Management on the Implementation of RPA Projects

This form has been created by Luis Dancuart as part of the MBA final project. No information will be shared and all responses will be deleted upon the completion of the assignment.

1. Would you consider the RPA project a success?

☐ The project met all our expectations

☐ The project met some of our expectations

☐ There are some processes that cannot be automated at this stage

☐ The process is still highly dependent on human intervention The project failed

2. What was the aim of the RPA project? (select two options)

☐ Cost reduction

☐ Improve process efficiency

☐ Reduce human dependency

☐ Reduce operational risks as a result of manual processes

☐ Improve compliance

3. What would you consider were the two areas that presented the greatest challenge? (select two options)

☐ Technology platform

☐ Process mapping and development

☐ Adoption of automation

☐ Third party system integration

☐ Internal barriers

4. What change management approach was followed when implementing RPA? (select all applicable options)

☐ Staff and management worked together to develop the solution

☐ Success was tracked based on processing volumes and reduction of human intervention

☐ The affected individuals were trained throughout the process

☐ A clear vision and end state was shared with all affected employees

☐ Management was involved and worked with the teams throughout the deployment to ensure adoption

5. In your opinion, were the employees adequately supported during the RPA implementation?

☐ Yes, adequate support was provided throughout the process

☐ The change management team was active in providing support and communicating the end state

☐ It was up to the employees to seek support from management

☐ The teams required more support than was provided

☐ The teams felt lost throughout the implementation

6. As part of the adopt automation, how was the training conducted?

☐ Face to face

☐ Classroom sessions supported by e-Learning

☐ e-Learning only

☐ Process information was provided on an ad hoc basis

☐ No training was required

7. How was the change communicated throughout the implementation process?

☐ The change was communicated at the start of the project and measured throughout

☐ Management shared updates on the automation project regularly

☐ Only the change management team communicated with the team upon reaching project milestones

☐ Project updates were only mentioned during general status meetings

☐ Employees had to actively engage with management to understand the change

8. What was the purpose of the training provided to the employees affected by the change?

☐ To enable employees to work side-by-side with the implemented automated solution

☐ To reskill employees to fulfil a different role in the organisation

☐ To empower employees to focus on value-adding activities in their current roles

☐ The employees had sufficient knowledge of their jobs, and their focus would be shifted immediately to more value-adding activities

☐ Training was not necessary

9. When considering automation, how were the effects of job security considered?

☐ An analysis was carried out before automation was introduced to ascertain how many people would be affected

☐ An analysis was carried out at the start of the project and the implementation time was used to train and relocate people

☐ Only key staff would remain on the process the rest would be relocated internally

☐ Depending on performance, some staff would be made redundant, and others would remain employed

☐ Little analysis was carried out; the success of the project would determine how people would be displaced in time

10. How likely is it that that automation will displace workers?

☐ Very likely

☐ Somewhat likely

☐ Neither likely nor unlikely

☐ Somewhat unlikely

☐ Very unlikely

11. Given that automation reduces the manual intervention in processes, how are people's career paths affected post automation?

☐ The organisation is pivoting towards automation as a strategic initiative, which will result in a reformulation of roles and responsibilities

☐ The effect that automation will have will be considered upon completion of the project

☐ Jobs and career paths remain unchanged

☐ The impact on careers is being discussed and no decision has yet been made

☐ I am unsure of how roles and responsibilities will be impacted

12. Are there any benefits of the automation that will be extended to society or are they limited to the organisation?

☐ The automation technology will be shared with people outside of the organisation

☐ The automation has some elements that will benefit society

☐ External parties have the option to interact with the automation

☐ The automation will start in the organisation and could extend to the public

☐ The benefit of the automation is only aimed at individuals within the organisation

13. How is the automation aimed at increasing individual productivity?

☐ The automation is aimed at processes executed by individuals, culminating in a broader process

☐ The automation is limited to small group of users that perform many manual tasks

☐ The automation will replace some manual functions affecting many users across the organisation

☐ The automation will replace multiple manual functions for a small group of people

☐ The automation is introduced for a new process previously not performed

14. What areas of the change management do you think were carried out most successfully? (Select three)

☐ Communications

☐ Management alignment

☐ Strategic alignment

☐ Training and development

☐ Culture definition and alignment

☐ Process alignment

☐ Organisational alignment

☐ Adoption initiatives

☐ Roles and responsibilities

☐ Scalability across the organisation

☐ Project management

☐ Success tracking and lessons learnt

15. What areas of the change management do you think could be improved? (Select three)

☐ Communications

☐ Management alignment

☐ Strategic alignment

☐ Training and development

☐ Culture definition and alignment

☐ Process alignment

☐ Organisational alignment

☐ Adoption initiatives

☐ Roles and responsibilities

☐ Scalability across the organisation

☐ Project management

☐ Success tracking and lessons learnt

16. Do you believe that your organisation is ready to adopt automation based on people's readiness and cultural criteria?

☐ Very likely

☐ Somewhat likely

☐ Automation should start small before it is generally adopted

☐ People are hesitant about automation because they don't understand it

☐ We are far away from automation and people will resist change