The role of robotic process automation in Process Mining for digital projects

Semakaleng Maherry

2014625

2014625@students.wits.ac.za

Supervisor: Dr. Michael Sony

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ABSTRACT

A number of organisations have been struggling with process optimisation for a while. However, with the emergence of RPA and Process Mining, organisations may now enhance their process optimisation initiatives. RPA and Process Mining make use of technology to optimise business processes, reduce manual tasks, and improve operational efficiency. The approach allows organisations to achieve cost and time saving, improve accuracy and quality, improve employee productivity, ensure process compliance and standardisation, and, ultimately, improve customer experience and revenue.

The research seeks to examine how the RPA and Process Mining may be used to accelerate digital transformation as well as improve processes within organizations while accelerating system implementation. The research will provide evidence on how combined implementation of RPA and Process Mining may be conducted as well as opportunities for improvement when it comes to implementing process optimization using RPA and Process Mining. The research expands on Siderska (2020) previous research on the implementation of process automation technologies. The aim of this research is to examine the benefits, challenges, and critical success factors associated with implementing RPA and Process Mining.

To assess the research findings of the research on implementing RPA and Process successfully, the following research questions were used:

- What are the benefits, potential challenges, and motivations for implementing RPA with Process Mining in digital projects compared to individual implementations?
- What are the critical success factors for implementation of RPA with Process Mining in digital projects?

The qualitative approach was used to collect information from 15 participants using semi-structured interviews. These participants were either current or past members of the Centre of Excellence teams, and they were involved on RPA and Process Mining projects both individually and in collaboration. The information

that was gathered during these interviews has contributed to a more in-depth understanding of the issue in question.

RPA and Process Mining adoption requires proper case selection, defined business goals, change management methods, clear business drivers, and measurable outcomes. Cost and time savings, employee time optimisation, human task replacement, process standardisation, holistic process improvement, process compliance, and simplicity of implementation are all benefits that can be measured. According to the research, process selection, system interface, business requirements, and organisational culture may all have a positive or negative impact on the outcome of the implementation. To ensure effective adoption, organisations have to carefully consider these challenges before implementing RPA and Process Mining. The executive's active backing and advocacy of the implementation can help connect the use case with the organization's strategic goals and ensuring that important business drivers are considered into the implementation strategy.

KEYWORDS

Robotic Process Automation (RPA), Robotic Process Discovery (RPD), Business Process Excellence (BPE), Business Process Management (BPM), Process Mining, Critical Success Factor

DECLARATION

I, Semakaleng Maherry, student number 2014625 declare that "*The role of robotic process automation in Process Mining for digital projects*" research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: **Semakaleng Maherry** Signature:

Signed at …….

On the …….. day of …… 20…..

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Table 1: List of acronyms

ACRONYM	DESCRIPTION
ANT	Actor-Network Theory
BPE	Business Process Excellence
BPM	Business Process Management
CoE	Center of Excellence
PMO	Project Management Office
PS	Professional Services
RPA	Robotic Process Automation
RPD	Robotic Process Discovery
TA	Thematic Analysis

CHAPTER 1. INTRODUCTION

1.1 Background of the study

The Business Process Management (BPM) has been used by most consulting companies to effectively implement and develop the standards and frameworks were packaged as a service offering to the market. On the other hand, software vendors have expertise with the implementation of process automation as well as BPM frameworks, a service perceived by consulting companies to be specialised and challenging (Benraad et al., 2022). The consulting companies had to develop the required skills set for effective implementation of process automation.

With technological developments it was imperative for consulting companies to upskill and take advantage of the increased demand in process automation and widen service offering. This was achieved by fostering partnerships with software vendors. Consulting companies that provided professional services utilised new technology to improve the business models and develop additional revenue streams; other start-ups understood early on that they needed to leverage technology to provide more value to their customers (Fenwick, 2022).

Digital technology has been the most significant industry disrupter, changing the course of business and serving as a source of innovation (Osman, 2019).

Most business leaders were concerned about their organization's survival and growth because of digital disruption and competition created by digital innovations, as well as expected business trends caused by digital disruption in many business sectors (Krotov, 2019). Several years have seen the rapid growth of the importance of digital technologies in achieving business goals of organisations. The use of modern software technologies and processes has transformed the ways in which organizations operate over the years, which has been a driver of digital transformation. Some of the technologies used to drive digital transformation to improve and enhance processes are Robotic Process

Automation (RPA) and Process Mining. RPA technology has influenced how businesses, industries, and ordinary people interact and communicate (Osman, 2019).

According to Osman (2019) RPA was utilized in the banking industry to automate the payment process, which has revolutionised and encouraged new innovative payment options, RPA was initially used to automate repetitive payment processes but was subsequent identified as Straight Through Process (STP) due to its simplicity and lack of deviations (Osman, 2019). This characterizes RPA as a technology that requires a straightforward process with minimal to no variation and, most importantly, must be repeatable over time (Moraes et al., 2022).

The RPA technology follows basic business rules that execute business logic to carry out and screen recordings from business users; these are actions that a business user will carry out to complete a particular task and the activities will entail multiple interactions with different system interfaces (Moraes et al., 2022). The Process Mining technology utilizes a data extraction approach, extracting data from event log files and/or direct system connections in order to discover, perform root cause analysis, identify bottlenecks, and gain useful insight into operational processes in order to enhance processes (Sun et al., 2018).

According to Marnewick and Marnewick (2022), when enhancing operational processes, there is usually a strong push for digital projects, that includes any business initiatives that involve the use of digital tools or technology to achieve a specific objective and/or address a business problem. The ultimate outcome might be the creation of a website, mobile applications, an e-book, the automation of business processes, and the development of an e-commerce platform (Marnewick & Marnewick, 2022). The major goal of the digital project is to help the business grow revenue, increase brand exposure, most importantly improve the customer experience (Ramani et al., 2021). Whereas traditional projects are business initiatives focused on resolving business challenges that may or may not be digitally driven but are meant to address complex business problems,

these projects can be strategically important for the business (Lechler et al., 2022).

According to Santos et al. (2019), RPA may be utilized in some digital projects, mostly business initiatives carried out by internal staff rather than external stakeholders such as customers. One of the most important digital projects for RPA would be to automate human-driven processes that are repetitive in nature and have a large volume of task repetition and completion, resulting in high errors (Santos et al., 2019).

The research investigated the challenges of implementing RPA with Process Mining, as well as the benefits of combining the technologies and determining the value for the business.

1.2 Research problem

The challenge of integrating RPA with Process Mining sparked the research interest in the research problem.

According to Leopold et al. (2018) one of the most difficult challenges in RPA initiatives is selecting an suitable process for RPA to enable digital projects as well as evaluating the work required to determine the level of automation and its potential impacts for business. Process Mining faces similar challenges to RPA in terms of identifying suitable processes to be utilized in Process Mining. The challenge is data extraction from multiple data sources, where it is usually unclear how much data to incorporate into the process analyses and how much uncovering is required for demonstrating the value for business (Choi et al., 2021). To ensure the success of RPA implementation, extensive process identification should be conducted before executing RPA projects, with the identification revealing if the process has higher volume transactions, such as a high number of online applications or online payments (Stravinskienė & Serafinas, 2021). The process should be standardized or optimised, should not change regularly, and should be prone to error by humans (Stravinskienė & Serafinas, 2021).. The implications of not selecting the appropriate candidate for RPA and ignoring some of the most important best practices of RPA candidates

could have a negative impact on the outcome of the deployment and result in a failed initiative.

1.3 Statement of purpose

The purpose of the research study is to determine the role of implementing Robotic Process Automation (RPA) together with Process Mining, as well as the critical success factors for integrating these technologies for companies who have implemented initiatives related to RPA and Process Mining to accelerate digital transformation and improve business operations for their customers.

1.4 Research questions

The research extended the study of Siderska (2020) regarding the implementation of RPA and combined technologies such as Process Mining, Robotic Process Discovery (RPD), Business Process Management, and how these tools can enable the automation of complex processes. The objective of the research to investigate the challenges of integrating different technologies, as well as the skills required for the integration of RPA and Process Mining, as well as the potential risk of overreliance on automation.

- What are the benefits, potential challenges, and motivations for implementing RPA with Process Mining in digital projects compared to individual implementations?

- What are the critical success factors for implementation of RPA with Process Mining in digital projects?

1.5 Rationale

While most RPA software replicates the activities of business users, Process Mining solutions leverage transactional information to discover and enhance executed processes from different sources of data in order to identify opportunities for improvement utilizing different scenarios (Stravinskienė & Serafinas, 2021). There have been several RPA and Process Mining implementations where businesses have benefited and where organizations are still striving to generate value from RPA projects (Enriquez et al., 2020).

According to Enriquez et al. (2020), the benefits of RPA include the fact that software licenses may be considerably lower than the cost of a full-time person, and the amount of work produced by robots is equivalent to about five employees. (Enriquez et al., 2020) emphasize in their research study that RPA is relatively easy to implement and does not require technical skills, and that organizations do not have to replace or redevelop systems as RPA leverages existing systems. As a result, the solution is suitable for the IT team to maintain since it conforms to IT Governance policies (Enriquez et al., 2020). Because RPA leverages existing systems and mimics business user activities, there is a possibility that the robots will mimic incorrect activities because the robots lack cognitive skills to solve or anticipate errors. Before allocating robots for automation, Process Mining may be utilized to undertake root cause analysis and process conformance (Kundra et al., 2015).

The research intended to examine the causes for failure in implementing RPA capabilities, such as how come tasks from RPA bots cannot be utilized to enhance specific operations and tasks within the process for the organization after users' activities have been implemented and specific processes delegated to RPA bot (Kramer, 2023). The research seeks to examine how the tools may be used to accelerate digital transformation as well as improve processes within organizations while accelerating system implementation.

The research will provide evidence on how unified implementation of RPA and Process Mining may be conducted as well as opportunities for improvement when

it comes to implementing process optimization utilizing RPA and Process Mining (Kramer, 2023)

The theoretical contribution will be to identify the challenges associated with the selecting the RPA and Process Mining initiatives as well as to determine the effort required and how will business be impacted by both process automation and process improvements. The challenges associated to inputs from selecting a repetitive and rule-based process which will be a suitable candidate for RPA process as well as challenges of extracting data from multiple sources where the measurements for business value were not identified properly this become as challenge to demonstrate value to business.

According to Leopold et al. (2018) one of the most difficult challenges in RPA initiatives is selecting a suitable process for RPA to enable digital projects as well as evaluating the work required to determine the level of automation and its potential impacts for business. Process Mining faces similar challenges to RPA in terms of identifying suitable processes to be utilized in Process Mining. The challenge is data extraction from multiple data sources, where it is usually unclear how much data to incorporate into the process analyses and how much uncovering is required for demonstrating the value for business (Choi et al., 2021). To ensure the success of RPA implementation, extensive process identification should be conducted before executing RPA projects, with the identification revealing if the process has higher volume transactions, such as a high number of online applications or online payments (Stravinskienė & Serafinas, 2021). The process should be standardized or optimised, should not change regularly, and should be prone to error by humans (Stravinskienė & Serafinas, 2021).

The results of the research will be of interest to professionals, researchers, and scholars interested in RPA and Process Mining.

1.6 Delimitations of the study

a) The research focused on main on the Consulting companies offering Professional Services for business process excellence and process automation.
b) The research covered organizations that had implemented RPA or Process Mining and were considering implementing the tools.
c) The research excluded automation of business management systems and other system integration.

1.7 Assumptions

The research study assumes the study will be based on organisation who have implemented RPA and/or Process Mining where the outcome was successful which implies the process was performed by either attended or unattended robot, where the project failed is where the business couldn’t derive value from the implementation or where the implementation had issues.

1.8 Definition of terms

Terms	Description
Business Process Excellence (BPE)	Business process excellence is a method for implementing operational excellence to promote a culture of continuous improvement within an organization by constantly looking for opportunities for improvement and operational efficiencies
Business Process Management (BPM)	Business process management (BPM) is a discipline that use different approaches to identify, design, analyse, measure, improve, and streamline organisation ways of working (Gartner)
Process Mining	Process Mining is a method for discovering, monitoring, and improving executed processes by extracting data from different data sources, such as event log files or direct system integration. Process Mining may also be used for benchmarking, continuous improvement, identifying process bottlenecks, implementation validation, and identifying RPA candidates (Gartner; Kramer, 2023)
Professional Service (PS)	Professional Service (PS) is when a contractor or service provider offers to help a customer manage a part of the business, which might be due to a lack of internal personnel or a skill gap (Rouse)
Robotic Process Automation (RPA)	RPA is productive tool which records business user screen in order to mimic the activity and as robots to perform human tasks, the RPA requires a high volume, prone to error and repetitive process which follows basic business rules that execute business logic (Moraes et al., 2022)
Robotic Process Discovery (RPD)	Robotic Process Discovery (RPD) is a method for recording business user activities they perform to finish a process. The activities may be visualized to generate end to end process view of the business, which can then be analysed and monitored for continuous improvement. (Kramer, 2023)

Table 2: Definition of terms

1.9 Chapter Outline

Chapter	Description
Chapter 1: Introduction	The chapter outlines the study's purpose, provides context for RPA and Process Mining tools, then discusses the research topic and indicates its significance.
Chapter 2: Literature review and theoretical framework	The chapter will concentrate on a review of existing literature on critical success factors, RPA & RPD and Process Mining.
Chapter 3: Research methodology	The chapter will identify the research method and highlight the approach used to analyse the research problem, as well as detail the research methodology used to answer the research question.
Chapter 4: Research findings/results	The chapter will explain the study findings as well as present the findings.
Chapter 5: Discussion or fining or results.	The chapter will compare the findings and research results with the linked literature review.
Chapter 6: Conclusion, recommendations	The chapter will include recommendations as well as findings.

Table 3: Chapter Outline

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

The main purpose of the literature review was to examine previous study on RPA, Process Mining, and the critical success factors relating to them. The study started with implementation definitions for RPA and Process Mining, followed by a solution comparison. The next section addressed the theoretical background and conceptual framework for the research study, as well as benefits and limitations of the proposed solution. Finally, include a proposition into the conclusion.

2.2 Theoretical review

2.3 Definition of topic or background discussion

The RPA is software designed to execute business logic to carry out activities and screen recordings from business users, as well as instructions and business rules specified by developers (Moraes et al., 2022). The RPA technology performs time-consuming, repetitive, and high-volume activities that are carried out on a regular basis by business users (Ghouse & Sipos, 2022). The activities carried out by a business user may involve a task that includes multiple touchpoints with different systems, which the RPA assigned bots will consider and all the specific instructions (Moraes et al., 2022). Due to the nature of RPA technology, which follows the business logic stated, and its lack of cognitive abilities, organizations should consider selecting back-office and/or internal processes that are not customer facing for implementing a successful RPA project (Jiménez-Ramírez et al., 2023).

According to Kundra et al. (2015) Process Mining is the extraction of business process models from various different sources of data using the execution data event logs. Process Mining is a data analytics method, primarily used to extract

process-related information and analyse historical data of executed data (Yasmin et al., 2018).

The literature review will explore at some of the identified benefits, challenges, and recommended approaches for implementing both technologies, as well as possible causes for failure when implementing RPA together with Process Mining.
The research question will evaluate how to successfully deliver digital projects by combining RPA with Process Mining. The question addresses two aspects of implementation: the first is how RPA is implemented, and the second is how Process Mining is accomplished.

2.4 RPA implementation

According to Osman (2019), the majority of RPA projects are back-office oriented because they adhere to business rules, carry out repetitive tasks, handle huge volumes of transactions, and are prone to human errors. There must be a business case motivating and approval for the RPA initiative throughout the digital project implementation. Once the approvals are obtained, the RPA lifecycle will be followed (Osman, 2019). Salmen (2022) argues that processes must be repeatable, scalable, and standardized for RPA projects to be executed successfully, particularly for organizations that run complex and unstructured processes. When implementing RPA, such organizations must take precautions; otherwise, it will be exceedingly difficult to implement complex processes that include multiple variants, cost more money, and be a maintenance nightmare.
According to several research studies, RPA has been identified as a technology with a potential to "reduce an organization's salary and other expenses because data entry work is performed by software instead of a human being." (Ghouse & Sipos, 2022).

2.4.1.1 *Benefits, limitation, and challenges of RPA implementation*

According to Aguirre and Rodriguez (2017), some research papers highlight RPA benefits such as higher productivity, reduced costs, enhanced speed, and reduced errors, indicating success in RPA project implementation.

Below Table 4 indicate list of RPA benefits, motivation, limitation and challenges and the corresponding descriptions.

Key factors	Description
Benefits	Benefit of RPA is the ability to collect data in order to analyse it and solve real-world problems utilising AI-based systems that are not industry or application domain specific (Gupta et al., 2022)
Challenges	One of the major challenges identified by Gupta et al. (2022) is that most organisations still struggle with the concept of how RPA works and the impact of the implementation on the organisation, as well as how to segregate tasks between humans and robots and which processes to automate back-end or customer facing.
Limitations	One of the key limitations of RPA is that it requires a structured process, which means that there should not be too many deviations (Osman, 2019). RPA implementations lacks the testing environment which doesn't allow proper development and testing environments for implementation, development is done through trial and error which open the risk for robots to interact with production if not implemented or configured not done properly the mistake could be very negative for the organisation results (Agostinelli et al., 2019). Another limitation while RPA is rule-based, robots may fail to understand and carry out the rules properly due to the robots' lack of cognitive skills (Agostinelli et al., 2019).
Motivation	Motivation for many businesses to use RPA is to improve customer service and experience by accelerating the implementation of the project, implying that many organisations use RPA to accelerate automation projects (Gupta et al., 2022).

Table 4: RPA benefits, motivation, limitation, and challenges

2.4.1.2 *Critical success factors for RPA implementation*

According to Plattfaut et al. (2022), critical success factors include key operations that, when achieved, allow a business to achieve its goals and gain a competitive advantage over competitors in its industry. Furthermore, the same authors observed that there is no framework in the field of RPA despite the significant growth in RPA projects and the practicality and cheap cost of implementing RPA projects. Despite many studies on key success factors, researchers believe it is still not clear which CSFs directly affect organisational success with regard to RPA (Plattfaut et al., 2022).

Wewerka and Reichert (2023), listed some of important factors to consider while implementing an RPA project. To begin, identify important processes that are business rule-based, which means the process must be streamlined with few exceptions, and run in a stable environment(Wewerka & Reichert, 2023). Second, it is error-prone, very manual-driven, takes a long time for person to complete, highly repetitive in nature, and has low levels complexity (Wewerka & Reichert, 2023).

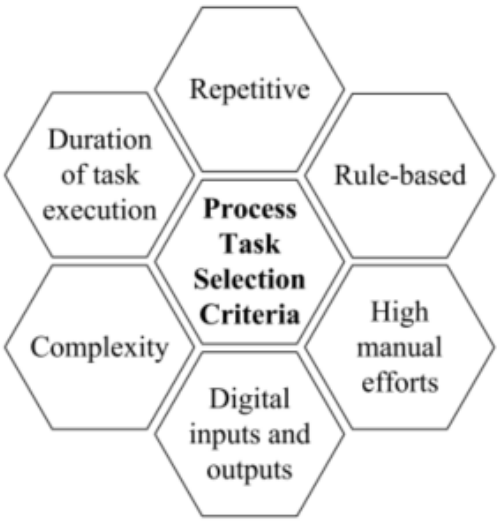

Figure 1**:** RPA selection factors (Wewerka & Reichert, 2023)

The above Figure 1 illustrates the identified factors discovered for selecting RPA projects. According to Wewerka and Reichert (2023), RPA automates a process task or an activity within a business process rather than the complete process. As a result, the task must be a lengthy process. For example, if a consulting company's Resource Manager has to generate an invoice, the Resource

Manager must first combine the monthly timesheets, then verify that the hours are correct, and then calculate the total cost for each consultant based on the hours and their hourly rate. Depending on the overall amount, the invoice may then be generated and sent for payment. In the case of creating monthly invoices, the process task indicates that the activity is repetitive, rule-based, manual, prone to human error, and has the potential to take a long time to complete.

Below Table 10: Critical success factors Table 5 indicate list of critical success factors for RPA and the corresponding descriptions.

Key factors	Description
Align to organisational Strategy	Ensure that RPA initiatives are aligned with process optimisation of the organization's strategic objectives. Also, while selecting a manual process for robotic automation, it must have excellent data quality and match the RPA requirements defined in order provide value to the organisation. Other factors that will impact the success of the initiative, such as governance and compliance, implementation approach, the skills required, and the impact of assigning human tasks to robots, should be defined by the business (Plattfaut & Borghoff, 2022).
Management support	Management support was also identified as a critical success factor to enable a proper change management process. Management support will ensure that RPA initiatives are prioritised, as well as by providing operational and technological resources to assist with the implementation and ensuring proper processes have been identified for robotic automation (Plattfaut & Borghoff, 2022).
Development of adequate skills	To prepare for RPA implementation, the organisation must identify the skills required to support RPA-related initiatives, as well as determine which personnel will require training and prepare whether roles should change, as well as analyse the impact of the change (Plattfaut & Borghoff, 2022).
Stakeholder involvement	As much as expertise is important to design and configure the bots, the process expert is required in the process of developing

	the bots as well as monitoring the performance of the bots (Plattfaut & Borghoff, 2022).
Development approach	RPA implementations must be well structured to allow for scalability and migration of bots to other platforms, as well as integration with other solutions. Another critical success factor identified, the need to standardise and develop a structured approach when developing bots while yet allowing for some flexibility. Flexibility will enable teams to explore and discover the best approaches for discovering inefficiencies (Plattfaut & Borghoff, 2022).
Continuous knowledge management	Continuous knowledge management includes CSFs that are more important for IT and project-related process improvements, such as knowledge from software vendors as well as expertise in maintaining bots and identifying problems as they arise (Plattfaut & Borghoff, 2022).

Table 5: Critical success factors for RPA

2.5 Process Mining implementation

According to Yasmin et al. (2018) Processing Mining is a data analytics techniques whose goals is to extract process-related information and specifically focused on analysing historical data of process executions in the form of event logs which may provide fact-based insights and support process improvements.

According to van der Aalst (2011) Process Mining is a discipline based on process modelling and data mining that allows organizations to extract data from their systems, analyse process conformance, identify bottlenecks, and predict execution issues.

The key concept of business Process Mining, according to Choi et al. (2021), is to extract the executable process that has been processed and recorded in the available systems, and the result will be a discovered process that can be used to compare the existing business process models with the new automatically constructed ones to identify deviations and bottlenecks, and to improve the business processes.

2.5.1.1 *Benefits, limitation, and challenges Process Mining implementation*

Key factors	Description
Benefits	Key benefits of Process Mining are that it is a data-driven approach that uses data to discover process models from event data, as opposed to the typical approach for documenting business processes that utilises process modelling. Process Mining uses event data to uncover process models and other relevant data which identify bottlenecks and process compliance (Van der Aalst, 2016).
Challenges	Data availability may also lead to other challenges such as acquiring the relevant data, which might be a challenge simply knowing which data to extract. Another data aspect is data protection, which poses a problem where sensitive data must be shared and/or protected (Reinkemeyer, 2020).
Limitations	Limitations pointed out in the study is data completeness; if parts of the data from the source system are missing, the reporting will have discrepancies, which might reduce process improvement in the organisation and may potentially delay project implementation (Reinkemeyer, 2020).

Table 6: Process Mining benefits, motivation, limitation, and challenges

2.5.1.2 *Critical success factors for Process Mining*

To successfully implement Process Mining, the business must identify a use case and an event log with the complete transactional data. The event log must include a case ID/process ID/transaction ID that must be a unique identifier, an activity/task name, and a timestamp highlighting the start and end date for the

activity, which can be used to provide insights into the discovered process patterns, bottlenecks and process variants (Elkhawaga et al., 2020).

The table below illustrates the event log file used as an example by (Elkhawaga et al., 2020).

		Properties			
Case ID	**Event ID**	**Timestamp**	**Activity Name**	**Resource**	**Cost**
1	3561	30 December 2018 10:02:15	Enter Loan Application	Sara	120
	3562	31 December 2018 09:08:22	Retrieve Application Data	Sue	100
	3563	01 January 2019 12:20:00	Compute Instalments	Mike	80
	3564	05 January 2019 10:10:28	Notify Eligibility	Pete	150
	3565	10 January 2019 08:30:10	Approve Simple Application	Sue	50
		……..			

Table 7: Expected Event Log File (Elkhawaga et al., 2020)

The above Table 7 illustrates important information required for Process Mining, which includes the Case ID, and this will be used to identify process activities discovered from executable systems, the Event ID, which will be used as an unique identifier trail for any event or action in the process, the Timestamp (start and end time), which will be the recording time when the process step was executed, and the Activity, which will be the name of the Activity/Task/Function.

Below Table 8Table 10: Critical success factors indicate list of critical success factors for Process Mining and the corresponding descriptions.

Key factors	Description
Project Management	The overall project activities and resources are managed in order to achieve the set project deliverables, and this serves as one of the key success factors for Process Mining implementation (Mamudu et al., 2022).
Management Support	Management sponsorship for the project, engagement of the workforce in the initiatives, advocacy for other business stakeholders' involvement, and identification of key resources to maintain and own the implementation once it is completed (Mamudu et al., 2022).
Structured Process Mining Approach	The method used to gather data, configure the process of analysis, and identify areas for improvement (Mamudu et al., 2022).
Data And Event Log Quality	The quality of event logs and other data sources collected from a number of sources as well as the data's usability (Mamudu et al., 2022).
Resource availability	The availability of the required resources throughout the implementation of Process Mining and ensuring the relevant skills are identified(Mamudu et al., 2022).
Process miner expertise	Ensuring that the person who will be implementing Process Mining understands all of the activities that must be performed for successful Process Mining implementation, including data extraction, configuration, analysis of the data, and presentation of the findings to business (Mamudu et al., 2022).

Table 8: Critical success factors for Process mining

In the research study Wewerka and Reichert (2023) indicates an organization's ability to adapt to internal and external changes can also be used to determine

whether process automation succeeds or fails. The factors identified refers to the technology and process data required, but another factor mentioned by Wewerka and Reichert (2023) is the people factor, which is critical in adopting the implementation; suggesting people factor must considered as critical success factor for RPA and Process Mining implementation

2.6 Compare implementation of RPA and Process Mining

When comparing the implementation of RPA and Process Mining, the research discovered that RPA uses an instruction-based approach, which means that a software robot will be assigned to copy user activities, and a robot will perform all the recorded activities, which means that if there was an error in the recording, the robot will repeat the error due to a lack of cognitive skills (Hyun et al., 2021). According to other research, Process Mining is a combination of process design and data mining which leverages event logs extracted in systems to identify data insights that may be used to communicate process conformance issues, bottlenecks, and process comparison (Hyun et al., 2021). According to some research, Process Mining can analyse RPA logs and monitor RPA bots, as well as use process discovery to generate RPA scripts for routine process steps from user interface data (Wewerka & Reichert, 2023).

Digital projects require a number to factors to be successful especially if implementation has an integration point between multiple system. In the past RPA and Process Mining reveals some similarities in how the technology is used for digital project implementations, RPA primarily used for automation to reduce burden and improve quality for organisations (Choi et al., 2021). Process Mining is used to discover issues with executed processes to suggest candidates for RPA (Aalst, 2020).

2.7 Difference between RPA and Process Mining

According to Aguirre and Rodriguez (2017), some research papers highlight RPA benefits such as higher productivity, reduced costs, enhanced speed, and reduced errors, indicating success in RPA project implementation.

The table below highlights the comparisons between RPA and Process Mining, it shows the difference and similarities to implementation of RPA and Process Mining. According to the research, the shared characteristic is a need for buy-in from important stakeholders and the establishment of suitable processes for both technologies prior to implementation and/or proof of concept (Choi et al., 2021).

Requirements	RPA	Process Mining
Approach	Standardised process, structured, straight through process, human activity driven, records user activities, business rules and logic driven (Osman, 2019)	Unstructured process, complex, multiple variants, driven using event log and/or transactional files, data insights and process intelligent (Gotthardt et al., 2020)
Technology	Lack cognitive skills (Osman, 2019)	Process data analysis, root-cause analysis (Choi et al., 2021).
Integration requirements	Back-end system, multiple touch points	Back-end and front-end system, multiple touchpoints
Cost	High cost of maintaining	High cost of developing and maintaining
Behaviour	Encoded knowledge, transactional in nature, with just a few exceptions (Moraes et al., 2022)	Encoded knowledge, transactional in nature, with just a few exceptions (Moraes et al., 2022)

Table 9: RPA and Process Mining comparison

There is still not adequate research done to determine the motive and benefits of combining RPA with Process Mining technologies, as well as how to discover process candidates for both technologies.

2.7.1 *Proposition 1*

The proper selection of RPA and Process Mining use cases may lead to a successful digital project implementation, as well as shortened completion times and increased process efficiency. The successful implementation of RPA and Process Mining requires a defined business goal backed by important stakeholders, as well as the use of change management methods to position and

market the solution and the benefits of implementing the solutions. Clear business drives for RPA and Process Mining will help in measuring project success.

2.7.2 *Proposition 2*

The outcomes and benefits of organisations aiming to implement RPA and Process Mining may differ depending on the process selected, the system interfaces, the business requirements, and the organisational culture that may contribute to the adoption of the solutions.

2.8 ANALYTICAL FRAMEWORK

2.9 Theoretical Framework

The Actor-Network Theory (ANT) will be used in the study as it is "the approach to understanding humans and their interactions with inanimate objects" (Cresswell et al., 2010).The ANT will allow the study to uncover and describe the elements and actors involved in the implementation of RPA and Process Mining to address the specifically chosen research questions (Davis, 1985). According to (Lakay & Iyamu, 2022) , an actor is "any entity that can make a difference in a network, which is both human and non-human," and Cresswell et al. (2010) describe an actor as "the source of an action regardless of its status as a human or non-human." – non-human can also refer to non-living things such as technology. The networks in the ANT framework can contain human and non-human actors, as well as things that may reflect ideas, things humans, and concepts are all referred to as actors in the ANT.

ANT is also defined as "technology and related factors as a socially constructed system evolving through a complex dynamic of interactions" by (Lee et al., 2015). According to Lee et al. (2015), ANT "helps in the analysis of how actors form alliances and involve other actors, including non-human actors (i.e., technology), to strengthen such alliances and secure their own interests."

The goal of ANT is to evaluate and theorize how to identify networks, which relationships exist within the network, which interactions are important, how actors are enrolled in a network, and which important parts of the network are required to form the network (Cresswell et al., 2010). Lee et al. (2015) also defines ANT as "technology and related factors as a socially constructed system evolving through a complex dynamic of interactions" According to Lee et al. (2015) ANT "assists in analysing how actors form alliances and involve other actors, including non-human actors (i.e., technology), to strengthen such alliances and secure their own interests".

The ANT approach promotes the contribution of non-human actors in uncovering some of the challenges and issues that may be encountered when implementing

IT solutions, as well as the social and technical impact that may affect how business organizations react to new ways of working, as well as the complexity that may be associated with implementation (Cresswell et al., 2011). This theory will emphasize the benefits of automating different elements of human activity-driven functions and how they executed data may be used for mining digital projects in the context of RPA.

ANT enables the researchers to evaluate and theorise how to identify networks, how to identify which relationship existing within the network and which interactions are important and how actors are enrolled into a network and the important parts of the network which are required to form the network (Cresswell et al., 2010). Similarly, the ANT approach is being used to uncover some of the challenges and issues that may be encountered when implementing IT solutions, as well as the social and technical impact that may affect how business organizations react to new ways of working, as well as the complexity that may be associated with implementation (Cresswell et al., 2011).

The study will be able to unpack the factors that contribute to the success and failure of RPA and Process Mining from a combination of human actors and non-human actors, which will include the type of processes selected for RPA initiatives, the data sources required for Process mining, the users of the technology, the methodology, the skills required, as well as the technologies used to implement the solution, as (Cresswell et al., 2010) outlined.

According to (Lee et al., 2015), the first stage is 'problematization,' which begins with the key actor at the network's center, where the key actor "defines the interests that others may share, establishes itself as indispensable, and sets the obligatory passage point through which all the actors in an actor-network must pass."
In the research study, the problematization specifies the critical success factors for both RPA and Process Mining based on business problems and/or business questions. According to (Lee et al., 2015), the second stage is referred to as 'interestment,' in which the main actor encourages or advocates to other network

actors about the benefits and disadvantages of not enrolling. The third stage is 'enrolment,' which occurs when other actors in the network adopt on the interests of the key actor. The final phase is ‘mobilization,' in which the primary actor establishes methods and processes to keep the other actor linked to the network (Lee et al., 2015).

ANT may be used to examine business opinions and insights during and after solution implementation, as well as how the solution has impacted workforce individuals inside the business. Using the ANT approach will also allow the study to provide theories on how to advocate for the solution's integration into the new ways of working for the business (Cresswell et al., 2011).

2.10 Conceptual Framework

The research will focus on the interaction between human actors (users) and non-human actors, including the technology tools, skills required, and methodology for implementing the project, which will add to some of the existing critical success factors and best practises for implementing RPA and Process Mining together.

The research body of knowledge contains information on what RPA is and how to identify a candidate for an RPA project Choi et al. (2021) and one author draw attention to the concept of Process Mining and also recommend which data to utilize for Process Mining projects (Aalst, 2020).

Because of a research gap, the study will focus on the following concept, RPA implementation, Process Mining implementation, digital project, and the consolidation of critical success factors which impact the combined implementation of RPA and Process Mining.

Figure 2: ANT Conceptual Framework for RPA and Process Miningillustrates which elements will be included and how they are linked to one another based on the ANT stages.

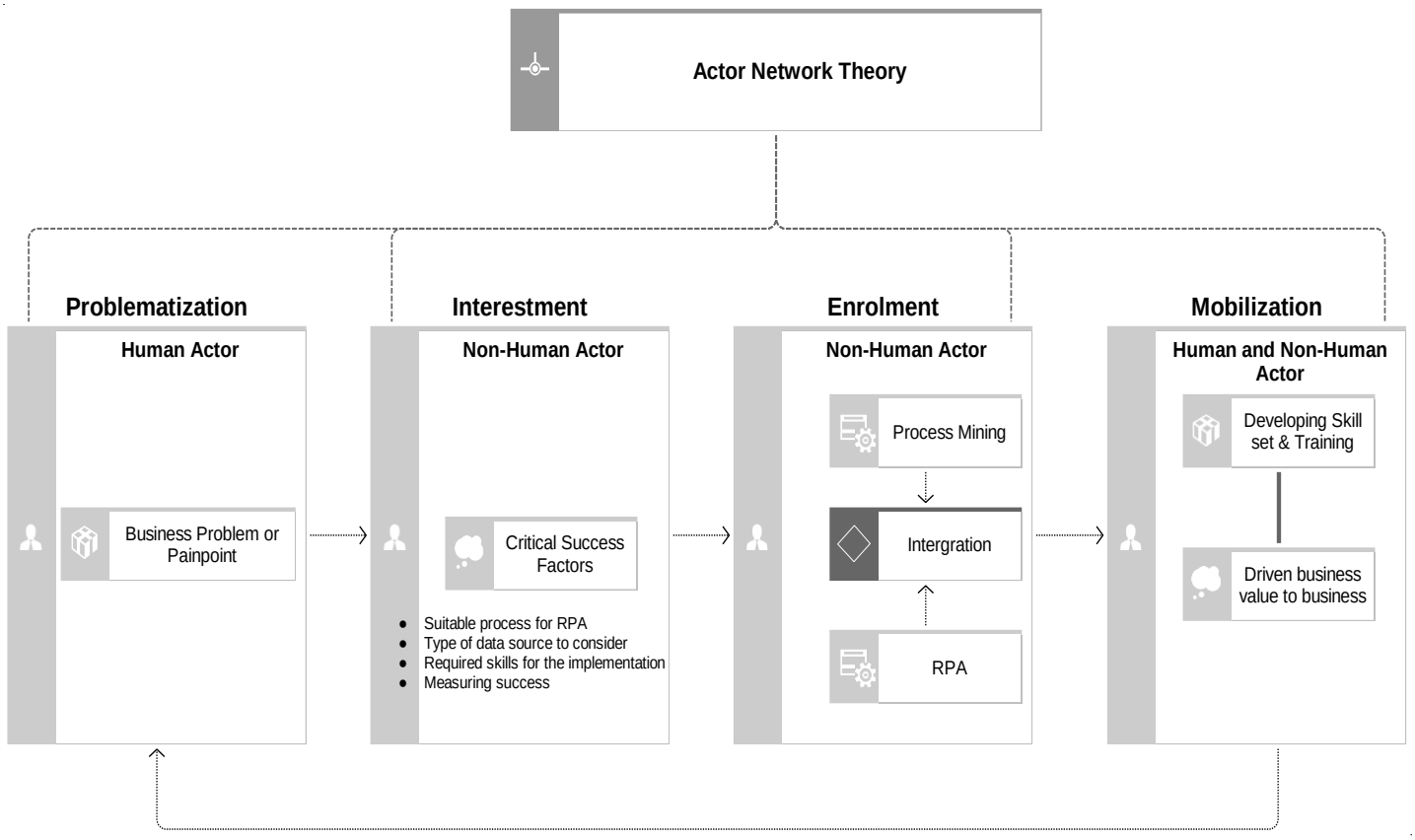

Figure 2: ANT Conceptual Framework for RPA and Process Mining

2.10.1 *Problematization*

2.10.1.1 *Business problem or pain point*

According to Lakay and Iyamu (2022), the problematization stage in the ANT framework enables network actors to identify the issues and business needs that could influence network performance and/or manipulate network activities. It can also trigger the simplification of various network factors, as well as the long-term reliability of designs and the discovery of other unknown factors that may be unconsidered business needs. This may result in identifying which actors in the network need to be enabled; it might be a technological or human factor (Lakay & Iyamu, 2022).

2.10.2 *Interestment*

2.10.2.1 *Critical success factors*

According to Plattfaut et al. (2022), it is important to fully understand the different tools and methodologies for implementing RPA solutions, as well as the methods used during implementation and the impact of using to the standard guidelines. A study of the critical success criteria, according to Plattfaut et al. (2022), has resulted in the development of a knowledgebase related to success factors, lessons learned, and considerations; nonetheless, there remains a gap in the framework for RPA implementation.

Below Table 10: Critical success factors indicate a list of critical success factors that apply to both RPA and Process Mining implementation, as well as the corresponding descriptions.

Key factors	Description
Tools and Methodologies	According to Plattfaut et al. (2022), it is important to fully understand the different tools and methodologies for implementing both solutions, as well as the methods used during implementation and the impact of using to the standard guidelines. A study of the critical success criteria, according to Plattfaut et al. (2022)has resulted in the development of a knowledgebase related to success factors, lessons learned, and considerations; nonetheless, there remains a gap in the framework for solution implementation.
Implementation approach	According to Plattfaut et al. (2022), there is a need to fully understand the various tools and approaches for implementing solution, as well as the methods utilized during implementation and the impact of using to the specified principles. According to Plattfaut et al. (2022), a study of the critical success criteria has resulted in the development of a knowledgebase related to success factors, lessons learned, and considerations; nonetheless, there is a gap in the framework for both solution implementation.
Fit for purpose	Plattfaut et al. (2022) indicated that RPA technology is aimed for automating rule-based user activity, whereas Process

	Mining is meant to optimize and analyse executable Plattfaut et al. (2022). There is a need to understand the fit for purpose of both RPA and Process Mining, Plattfaut et al. (2022) mentioned RPA technology meant for automating rule-based user activities while Process Mining is meant to optimise and improve executable processes Plattfaut et al. (2022). Based on the business needs, CSF must determine which solutions are most suited for specific solution implementations.
Integration	Syed et al. (2020) evaluated the critical success factors of implementing RPA, with one of the highlights being some of the factors that lead to the success of RPA, with one of the aspects stated to be around the implementation and integration, suggesting that it is "relatively easier and cheaper to implement, with a shorter timeframe up to six weeks to production." The duration and ease of usage may vary depending on the technology; some will be considerably easier to configure than others.
Business drivers	Other key considerations had been the business drivers for RPA, critical success factors should also cover if the business is embarking on cost-cutting measures, improving the quality of work and service provided to customers, or if there is a compliance objective that must be conformed to (Syed et al., 2020).
Organisation outcomes	Syed et al. (2020) mentions the critical success factors include "aligning company goals, challenges, and capabilities," and that the automated process must align with the organization's strategy and address a specific business process. RPA enables process transparency and standardisation, the study highlights the process will be executed the same way that will enable standardisation and all the activities will be recorded which will result in transparency (Syed et al., 2020).

Table 10: Critical success factors

The research conducted by Syed et al. (2020) details the other aspect of process intelligence which is also linked to Process Mining, the study highlights that the process intelligence can be used for the decision making by utilising the predictive analytic with the study the aim is also to assess how RPA can be used together with Process Mining in decision making. All discovered critical success factors should be made mandatory, as well as additional important requirements based on the sector and the specific offering of the business.

2.10.3 *Enrollment*

2.10.3.1 *Integration*

Syed et al. (2020) evaluated the critical success factors of implementing RPA, with one of the highlights being some of the factors that lead to the success of RPA, with one of the aspects stated to be around the implementation and integration, suggesting that it is "relatively easier and cheaper to implement, with a shorter timeframe up to six weeks to production." The duration and ease of usage may vary depending on the technology; some will be considerably easier to configure than others.

2.10.3.2 *Implementation of digital projects*

To implement a digital project successfully Vukadinović and Fabac (2022) emphasize “choosing an approach to digital transformation potentially includes an emphasis on strategy, processes, a structural approach, a project approach, and other performances.” The implementation of RPA with Process Mining should be aligned to a pain point within the business or problem which the organisation is aiming to solve.

2.10.3.3 *RPA implementation*

The RPA implementation emphasis the need for selecting the relevant process task in business process, Hyun et al. (2021) mentions “robots have been used for automation for a long time, resulting in innovation in terms of the faster operation process and higher product quality. Robotics Process Automation (RPA) can be said to have brought this innovation in the productivity improvement of many industries into the business office”. The research study will explore the

possibility of faster implementation of digital project and the prerequisite which must be included for the RPA and Process Mining projects.

According to Hyun et al. (2021) mentions that " robots have been used for automation for a long time, resulting in innovation in terms of the faster operation process and higher product quality. Robotics Process Automation (RPA) can be said to have brought this innovation in the productivity improvement of many industries into the business office" The research study will investigate the possibility of faster digital project implementation as well as the prerequisites that must be included for the RPA and Process Mining projects.

2.10.3.4 *Process Mining implementation*

According to Geyer-Klingeberg et al. (2018), Process Mining supports the implementation of RPA lifecycle initiatives which "enables digital transformation by identifying improvement potential with respect to key success factors like efficiency, speed, agility and compliance". The research will investigate how Process Mining selects candidates for RPA and the criteria use to qualify the RPA suitable project. The research will investigate at how Process Mining selects candidates for RPA and the criteria used for evaluating RPA projects.

2.11 Mobilization

In most organisations, the Centre of Excellence (CoE) will be responsible for ensuring operational and strategic activities are handled appropriately to achieve success in mobilising the business to adopt new ways of working. The CoE will be in charge of process innovation, finding opportunities for improvement, and implementing the solutions (Herm et al., 2023). The CoE will also ensure that new initiatives related to process improvement, which may be related to RPA and/or Process Mining initiatives, are prioritised, as well as that standard methods and techniques to be followed when implementing the solution are developed, as well as that relevant stakeholders are trained to develop and use the solutions implemented (Herm et al., 2023).

The implementation of RPA, Process Mining and Implementation of digital projects requires are clear strategy and a suitable use case for both RPA and Process Mining. Therefore, it can be hypothesised that:

2.12 Proposition 3

The executive's support for participating as an advocate and supporting the implementation of RPA and Process Mining may result in business users adopting and embracing the technologies. To have a greater adoption rate among business users, the use case selection must align with the strategic goals as well as support the identified business drivers in the organisation.

2.13 Conclusion of Literature Review

The literature research suggests that the success or failure of the digital project depends on the use case that is selected for the implementation of RPA with Process Mining. The literature study also identified a research gap in RPA and Process Mining, which will be covered by studies to come with the aim to address the research problem as well as evaluate the following hypothesis.

2.13.1 *Proposition 1*

The proper selection of RPA and Process Mining use cases may lead to a successful digital project implementation, as well as shortened completion times and increased process efficiency. The successful implementation of RPA and Process Mining requires a defined business goal backed by important stakeholders, as well as the use of change management methods to position and market the solution and the benefits of implementing the solutions. Clear business drives for RPA and Process Mining will help in measuring project success.

2.13.2 *Proposition 2*

The outcomes and benefits of organisations aiming to implement RPA and Process Mining may differ depending on the process selected, the system interfaces, the business requirements, and the organisational culture that may contribute to the adoption of the solutions.

2.13.3 *Proposition 3*

The executive's support for participating as an advocate and supporting the implementation of RPA and Process Mining may result in business users adopting and embracing the technologies. To have a greater adoption rate among business users, the use case selection must align with the strategic goals as well as support the identified business drivers in the organisation.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter covers research methodology, which includes the approach to study, research design, data collection methods, and how the population was sampled. The data collection processes and approaches utilised to interpret the data. The next section will examine research topics related to quality assurance such as transferability, credibility, and dependability, as well as ethical considerations, study limitations, and project timeline.

The research design methods used to examine the impact of combined RPA and Process Mining implementation will be described, as will the explanations for using empirical methods and research instruments for the purposes of the study.

3.1 Research approach

The research study approach will be qualitative, with data collected through semi-structured interviews. The main argument for using this approach is to develop an understand real-world situations that can be logically examined. The qualitative research methodology entails the investigation of concepts, their proposition, as well as interpretation in particular fields of investigation (Gammelgaard, 2017). The qualitative method intended to be used for the research study to provide additional details on the impact of combined implementation of RPA and Process Mining.

3.2 Research design

The technique to research design will be case study, which is described as "an empirical study that investigates in depth a real-world scenario" (Hollweck, 2016). The intended purpose of the case study is to discover knowledge used in the implementation of RPA and Process Mining that has never been effectively applied using of multiple data sources. The case study approach will enable the study to gain more insight into the research problem while also uncovering some of the complexities involved in the implementation of RPA and Process Mining (Leech & Onwuegbuzie, 2007).

3.3 Data collection methods

Collecting data for qualitative analysis will allow the research to obtain and analyse data that would have been disregarded with standard data analysis. (Lawrence & Tar, 2013). Individual interviews with the personas from Centres of Excellence (CoE) teams who participated in RPA and Process Mining projects separately, as well as combined implementations will be used to gather the primary data. The interviews will take place via virtual meetings with the relevant individuals.

3.4 Population and sample

3.4.1 *Population*

The research population included customers who have implemented RPA and Process Mining technology, as well as colleagues in product management for a particular vendor. Individuals responsible for process excellence in several business divisions, as well as members of their organization's Centre of Excellence (CoE) team, were the focus of the research. The participants' responsibilities were to formulate use cases, developing best practices, and assisting their organisation with solution implementation. They were aware of the business and implementation challenges that are associated with RPA and Process Mining implementation.

3.4.2 *Sample and sampling method*

According to Ayhan (2011), the study involved non-probability sampling, which did not accurately represent the target population. The purposive sampling approach was chosen to target known customers who had implemented RPA and Process Mining, as well as those who were currently implementing the solution; product management teams were in charge of designing the RPA and Process Mining features for the vendor's company. Purposive sampling enabled researchers to investigate RPA and digital project mining with subject matter experts in order to evaluate study questions; this sampling technique also allowed for replication in future studies and validation of the research's validity and

dependability(Morse et al., 2002). Purposive sampling enabled the study to focus on expert users' experiences with solution implementation, as well as the challenges and limitations that affected successful implementation.

Below Table 11 indicate list of targeted participants and the numbers of interviews linked to each focus area. The difference focus areas will have different views when approaching the digital projects implementations.

- Process excellence consists of up of four individuals who are responsible for supporting the business with process management and ensuring best practices and standards are followed. Process excellence participants will share insight into how they deliver value from RPA and mining digital projects for the purposes of the research (Anagnoste, 2013).
- Process automation consists of up of four people who are responsible for identifying candidates for RPA and mining projects as well as executing the solutions. The participants have technical and business knowledge, allowing them to interpret business value (Yadav & Panda, 2022).
- The PMO will be consist of two individuals who have been involved with RPA-related projects; these individuals will have insights into the benefits and motivators of selecting digital projects, as well as critical success factors.
- Data and Integration consists of up of three individuals who are responsible for designing robots and collecting data for mining digital projects (Anagnoste, 2017).
- Consultants consist of up of two people who are responsible of utilising the solutions to carry out projects as well as positioning the solution to businesses through selling and/or implementation (Anagnoste, 2017).

Focus Areas	**Number of interviewees**
Process excellence	**4**
Process automation	**4**
PMO	**2**
Data and Integration	**3**
Consultant	**2**

Total	**15**

Table 11: Proposed participant by focus area

3.5 The research instruments

Semi-structured interviews were used as a main research instrument to address the research topics stated in Chapter 1. A prepared list of questions was delivered to the participants, followed by additional probes and clarification questions. The research instrument had all the stated interview questions, and all participants signed the Consent Form.

3.6 Procedure for data collection

The interviews had been scheduled according to the participants' availability on a specific day and time. Initially, notification of participation was sent via email, followed by a phone call for clarification and a request that the participant complete out the calendar. Remote meetings took place via Microsoft Teams.

The data collection procedure will be as follows:

a) Participants in the study had received a request for participation, which included a summary of the research study's objectives.
b) An interview schedule was set up so that the participant can choose the most suitable time for the interview.
c) The online meeting was scheduled properly, and participants were emailed a set of guidelines for interviews with potential questions to help them prepare for and discuss on the topics that were being investigated.
d) The participant was requested to complete and sign a participation consent form.
e) The questions and responds were then organised into a spreadsheet for data analysis and interpretation.

3.7 Data analysis strategies and interpretation

Qualitative data analysis is defined as a systematic examination and interpretation of spoken words and/or visually presented data in order to make

arguments about the material's both implicit and explicit dimensions and structures of meaning and what it represents as well (Mezmir, 2020). To analyse the data, Thematic Analysis (TA) will be used; this method allows for the systematic identification, organisation, and insight into patterns of meaning (themes) across the data collected (Braun & Clarke, 2012). The TA approach will allow the study to uncover similar underlying concepts between RPA and Process Mining when businesses implement process automation and process improvement to identify common themes and patterns businesses make use when selecting the ideal process.

The online forms will be utilised for gathering the data for the interviews; once all the interviews have been completed, the data analysis will kick off by organising the data by population as well as spending time listening to and taking notes on the interview recordings. Data will be extracted and organized using spreadsheets and online forms after the recorded interviews have been analysed. The data will be used to develop themes and map their relationship, which will be analysed and interpreted to provide the results. Finally, study findings and conclusions will be compiled and formally presented.

3.8 Possible limitations and challenges of the study

The study has been limited to qualitative research, and the challenge could arise from the lack of the population's availability and access to sufficient data for the research study.

3.9 Quality Assurance

3.9.1 *Transferability*

The transferability indicates the narratives developed the study can fit or similar research findings and results can be made by other researchers, implied and implemented in other context outside the research study (Lincoln & Guba, 2004). To demonstrate the transferability of the research study, the approach used to contact participants, as well as the process of planning interviews and any other information required to complete data collection, will be detailed (Lewis, 2009). Transferability is critical, particularly for the impact of implementing RPA and Process Mining in digital projects since the results and insights may be reused or replicated by other researchers and organisations pursuing process improvement and process automation.

Purposive research questions will contribute to transferability, as will providing a rich description and robust data with a wide variety of information through accurate as well as precise descriptions of RPA and Process Mining critical success factors and implementation requirements (Cypress, 2017).

3.9.2 *Credibility*

The nature of credibility in research studies, which is intended to focus on internal validity, promotes the truthfulness of what the researcher states (Lewis, 2009). In order to create categories or themes for a study, triangulation is a validity method in which researchers attempt to identify alignment across various and multiple sources of data (Creswell & Miller, 2000). The triangulation approach will be employed to verify the data gathered utilizing various data sources, including webinars and annual report and article publications.

3.9.3 *Dependability*

Qualitative research uses dependability to promote consistency, repeatability, and replication in research (Ibiamke & Ajekwe, 2017). The key words used for the search strategy were "critical success factor," "robotic process automation," "process mining," and "business process excellence" in the knowledge bases Scopus, Webofscience, Google Scholar, and IEEE. The research questions, together with corresponding propositions and guidance on how research

interviews will be carried out are stated below as part of evidence of dependability and consistency.

3.10 Ethical considerations

- The objective of the research and how it would be carried out. and then asked for permission to record the interview while also explaining why it was being recorded.
- As part of the ethical requirements, the participant was requested to sign a consent form, and the research participant's identification remained confidential; the individual was referred to as P1 for participant 1.
- During the interview, the participant might opt out at any point, and the session would be cancelled, with the data acquired not being included as part of the research data.
- Plagiarism form was completed up and submitted according to requirements the University's submission requirements.

3.11 Proposed schedule and timelines

Below Table 12 provide a potential schedule for the research project.

Phase	Activity	Estimated duration	Start Date	End Date	Deliverable
Research Proposal methodology	Introduction, research problem Literature review and theoretical framework Research methodology		18 March 2023 15 April 2023 21 May 2023	15 April 2023 21 May 2023 30 June 2023	Research Proposal *Chapter 1* *Chapter 2* *Chapter 3*
Panel presentations	Proposal Presentation Panel feedback		05 July 2023	11 July 2023	Research presentation Research proposal results
Ethic Application	Ethic Application Ethic outcomes		04 August 2023	04 August 2023	Submit completed Ethics form Ethic application results
Data analysis and presentation of results	Data analysis and presentation of results Compile the questionnaire Consolidate the data Interpret the data and prepare the results		23 August 2023 11 January 2024	10 January 2024 11 February 2024	*Chapter 4* Questionnaires Participant recordings and notes
	Discussion of results and conclusions				*Chapter 5* Research report

Discussion of results and conclusions	Submit research report	24 February 2024	

Table 12: Research project schedule

3.12 Consistency table: research questions, propositions, data collection and data analysis

Research problem: The **r**esearch to investigate challenges and the role of Robotic Process Automation in the mining of digital projects, using ANT to analyse factors like selected processes and data sources.					
RQ #	**Research Question**	**Prop #**	**Proposition**	**Data collection detail**	**Data analysis method**
1.	What are the benefits, potential challenges, and motivations for implementing RPA with Process Mining in digital projects compared to individual implementations?	1	The proper selection of RPA and Process Mining use cases may lead to a successful digital project implementation, as well as shortened completion times and increased process efficiency. The successful implementation of RPA and Process Mining requires a defined business goal backed by important stakeholders, as well as the use of change management methods to position and market the solution and the benefits of implementing the solutions. Clear business drives for RPA and Process Mining will help in measuring project success	Interview guide questions 6-11	Thematic analysis

Research problem: The **r**esearch to investigate challenges and the role of Robotic Process Automation in the mining of digital projects, using ANT to analyse factors like selected processes and data sources.					
RQ #	**Research Question**	**Prop #**	**Proposition**	**Data collection detail**	**Data analysis method**
2.	What are the critical success factors for implementation of RPA with Process Mining in digital projects?	2	The outcomes and benefits of organisations aiming to implement RPA and Process Mining may differ depending on the process selected, the system interfaces, the business requirements, and the organisational culture that may contribute to the adoption of the solutions.	Interview guide questions 12-17	Thematic analysis
		3	The executive's support for participating as an advocate and supporting the implementation of RPA and Process Mining may result in business users adopting and embracing the technologies. To have a greater adoption rate among business users, the use case selection must align with the strategic goals as well as support the identified business drivers in the organisation		

Table 13: Research consistency

(Hofstede, 2023)

CHAPTER 4. PRESENTATION OF RESULTS / FINDINGS

4.1 Introduction

This research study aimed to determine the role of implementing Robotic Process Automation (RPA) together with Process Mining and the critical success factors for integrating these technologies. The study focused on companies that have implemented initiatives related to RPA and Process Mining to accelerate digital transformation and improve business operations for their customers. The objective of the research was to investigate the benefits, potential challenges, and motivations for implementing RPA with Process Mining in digital projects compared to individual implementations. This chapter presents the study's findings, starting with an overview of the sample, followed by answering the research questions.

4.2 Overview of the sample

This section highlights the characteristics of participants in RPA and Process Mining Implementation. Diving into the complicated scenery of Robotic Process Automation (RPA) and Process Mining implementation, a diverse group of participants was gathered, each bringing unique experiences, qualifications, and roles to the table. This analysis sought to unravel the distinct characteristics of this participant cohort, shedding light on their potential influences on the study's findings.

Business Titles – The group of participants is marked by a collection of business titles, ranging from the strategic realm of Head of Process Excellence to the technical domain of Scrum Master. This diverse mix suggests that the study encapsulates perspectives from both high-level strategic decision-makers and hands-on technical practitioners.

Experience in Role – With over a decade of experience for some participants and a few years for others, this cohort embodies a rich tapestry of professional backgrounds. The inclusion of both seasoned veterans and those relatively new to their roles ensures a dynamic exchange of insights. The longevity of some participants in their positions brings a wealth of industry knowledge, while the newer entrants may provide fresh perspectives unimpeded by long-established practices.

Level of Education – The academic fabric woven into this group is equally diverse, featuring Master's degrees, MBAs, Doctoral degrees, and National Diplomas. This amalgamation hints at varying theoretical foundations and approaches to problem-solving. The interplay between practical experience and academic grounding is poised to influence the participants' analyses, contributing to the multifaceted understanding of RPA and Process Mining.

Gender Composition – While most participants identify as male, with only one female participant, gender diversity in this study is somewhat limited. Recognising the potential impact of gender on perspectives, it is imperative to glean insights from the female participant to ensure a more balanced and comprehensive understanding of the topic. Table 1: Participant Profile Overview in RPA and Process Mining

Part	Business Title	Experience in Role	Level of education	Gender	RPA Experience	Process Mining Experience
P01	Head of Process Excellence – Banking	11 years	MBA	Male	Seven years	2 to 4 years
P02	Senior Director – Business Transformation (EMEA)	More than five years	Master's Degree	Male	Eight years	Eight years
P03	Head of Professional Services Advisory (UK & Nordics)	One year	Doctoral Degree	Male	3.5 years	Four years
P04	Scrum Master in the automation engineering	More than five years	National Diploma or an Advanced Certificate	Male	More than five years	More than five years
P05	Senior Solution Architect	Four years	Bachelor's Degree or Advanced Diploma – ICT	Male	Five years	15 years
P06	Senior Professional Service Consultant	Four years	Bachelor's Degree or Advanced Diploma	Male	Less year	2 to 4 years
P07	Principal Business Consultant – Business Architecture (UK)	Four years	Master's Degree	Male	More than five years	Six years

Part	Business Title	Experience in Role	Level of education	Gender	RPA Experience	Process Mining Experience
P08	Product Manager	Two years	MBA	Male	1 to 2 years	2 to 4 years
P09	Solutions Architect – Business Architecture in the UK	More than five years	2 Masters & MBA	Male	1 to 2 years	2 to 4 years
P10	ARIS Presale Technical Advisor	15 years	MBA	Male	Six years	Three years
P11	Senior Solution Engineer	Two years	Master's in Business Informatics.	Male	Eight years	Ten years
P12	Senior Director Product Management ARIS	Seven years	PhD in Business Administration – Information Systems.	Male	Four years	Eight years
P13	Senior Business Architect	Ten years	Master's in Mathematics Information Science & MBA	Male	Four years	20 years
P14	Senior Solutions Architect • Sales NAM Business Transformation	15 years	Master's Degree in Process Engineering	Male	Six years	Ten years
P15	Junior Professor/ Assistant Professor	Four years	Doctoral Degree	Female	Six years	12 years

4.3 Proposition 1 – Results and Analysis

4.3.1 *Dynamics of RPA and Process Mining Integration in Digital Projects*

The first research question can be restated as follows: "*What are the benefits, potential challenges, and motivations for implementing Robotic Process Automation (RPA) with Process Mining in digital projects compared to individual implementations?*"

Table 2 presents this research question's codes, subthemes, and themes. The analysis of the empirical data pertaining to Research Question 1 focused on understanding the benefits, challenges, and motivations associated with implementing RPA with Process Mining in digital projects, comparing them to individual implementations. The findings were organised into subthemes and an overarching theme, revealing the "Dynamics of RPA and Process Mining Integration in Digital Projects." By analysing the data, we discovered the benefits, challenges, and motivations associated with implementing RPA with Process Mining in digital projects. We compared these to individual implementations and organised the findings into subthemes and an overarching theme, revealing the "Dynamics of RPA and Process Mining Integration in Digital Projects."

Table 14: Dynamics of RPA and Process Mining Integration in Digital Projects

Subthemes	Themes
Complexity of Multiple Source Systems	Challenges in Data Extraction for Process Mining
Impact of Unstructured Data	
Concerns about Quantity and Quality of Data	
Diversity in Data Granularity	
Data Access and Testing Scenarios	Challenges in Implementing RPA Projects
Clear Understanding of Project Scope	
Distinction Between Attended and Unattended Bots	
Organisational Resistance	
Optimisation of Shared Services	Benefits of RPA Implementation
Time Savings	

Potential Replacement of Human Activities	
Optimisation of Employee Time	
Transparency in Business Processes	Benefits of Process Mining Implementation
Data-Driven Understanding	
Objective View, Discovery, and Continuous Improvement	
Measurement and Discovery	
Efficiency in Discovery Phase	Benefits of Combined Implementation (RPA and Process Mining)
Strategic Use Case Understanding	
Leveraging Business Value	
Integration Potential	
Need for Additional Tools	Complexity of Combined Implementation
Differences in Technologies	
Varied Perceptions of Complexity	

4.3.2 *Challenges in Data Extraction for Process Mining*

The participant responses offered unique perspectives on the challenges associated with data extraction for process mining. Participant 3 highlighted the complexity introduced by multiple source systems and software solutions in a given process, stating: *"It is usually when you think of a process, it can use several source systems as several software solutions to power the process" [P03].* This insight underscored the diverse nature of processes and the challenges that arise from the integration of various sources.

Participant P04 emphasised the impact of unstructured data on automation, stating, *"If the data is all over the place and there's no structure to their data, it makes it very difficult to automate something that is unstructured" [P04].* Here, the participant pointed out that unstructured data poses a significant challenge to automation, underlining the importance of structured data for effective automation. Participant P07 introduced concerns about both the quantity and quality of data, stating, *"The challenge I see is, of course, the lack of data or the quality of data" [P07].*

This participant's viewpoint added a layer of complexity by highlighting that the availability and reliability of data are critical factors in addressing the challenges of data extraction. Finally, participant P10 provided insights into the intricacies of data extraction, emphasising the diversity in data granularity across multiple source systems: *"Data extraction, we have multiple sources systems and multiple levels of granularity that the data is provided, and these different levels of granularity require very different methods of analysis and then aggregation" [P10].*

This participant underscored the need for varied analysis and aggregation methods based on the data's different granularity levels.

Challenges	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	P14	P15
Complexity of Multiple Source Systems	+	N	+	N	+	+	+/-	-		+	+	+	+	+	+
Impact of Unstructured Data	N	+	N	+	-	+/-	N	-		N	+	-	N	+	N
Concerns about Quantity and Quality of Data	+/-	+	+	+/-	+	N	+	+		+/-	+	+	+	+	+
Diversity in Data Granularity	+	+	+/-	N	+/-	N	+/-	+		+	+	+	+	+	+

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.3.3 *Challenges in Implementing RPA Projects*

There are various challenges encountered during the implementation of Robotic Process Automation (RPA) projects. Participant P04 emphasised challenges related to data access and testing scenarios, stating, *"It's obviously, you know, getting the data from the system, getting access to the application, getting the test data that we need in order to test the different scenarios within the system" [P04].* This points to the difficulties associated with data retrieval, application access, and obtaining necessary test data, which are crucial aspects in the initial stages of an RPA project.

Participant P08 highlighted the need for a clear understanding of the project scope and decision-making regarding automation, stating, *"To implement a robot, the challenge I see is, of course, the lack of data of it, where to implement it, and*

somebody has to make a decision if something is being automated or still a manual thing" [P08]. This underscored the importance of strategic planning and decision-making in determining the areas suitable for automation.

Participant P12 introduces the distinction between attended and unattended bots. *"An attended or unattended bot. So basically, you have a small tool running on your machine and activate it" [P12].* This brought attention to the consideration of bot types and activation methods, indicating a technical aspect that requires careful consideration during the implementation phase.

Lastly, participant P15 touched upon organisational challenges, specifically resistance from employees. The participant explained, *"Organisationally, there tends to be a lot of resistance from employees who don't basically want to be replaced as they like. They are always in fear that your software robot during their job" [P15].* This emphasised the crucial factor of managing organisational change and addressing concerns among employees who may perceive RPA as a threat to their roles.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Data Access and Testing Scenarios	**+**	**N**	**N**	**+**	**+**	**N**	**+/-**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**N**
Clear Understanding of Project Scope	**+**	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**N**	**+**	**N**	**+**	**N**	**+**	**+**
Distinction Between Attended and Unattended Bots	**N**	**+**	**N**	**+/-**	**+**	**N**	**N**	**+/-**	**+/-**	**+**	**+**	**+**	**+**	**+**	**-**
Organisational Resistance	**+/-**	**N**	**+**	**N**	**N**	**N**	**+/-**	**N**	**N**	**+**	**N**	**+**	**+**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.3.4 *Benefits of RPA Implementation*

The participant responses highlighted various benefits associated with the implementation of Robotic Process Automation (RPA) in their businesses. Participant P01 outlined the benefit of implementing RPA in the context of shared services, stating, *"Benefit for implementing RPA was based on the shared services*

function, which was the backend service, which was manual intensive which were automated and downsizing the manual to replace and enable BOTS to perform human activities" [P01]. This suggested that RPA was applied to automate manual-intensive backend services within shared services, leading to downsizing in manual efforts and enabling bots to perform these activities.

Participant P05 emphasised the time-saving aspect of RPA, stating, *"Essentially, the benefit is that you save time. People were spending time on X, and now they actually could utilise that time for other things" [P05].* The participant pointed out that RPA allows employees to redirect time previously spent on certain tasks to more valuable and productive activities.

Participant P09 mentioned the potential replacement of human activities through systems, noting *that it "Will replace human beings in doing activities through the systems, and this could have different benefits" [P09].* This indicated that the automation of certain activities through RPA can bring about various benefits potentially related to efficiency, accuracy, and cost-effectiveness.

Lastly, participant P14 discussed the value of automating the least valuable part of employees' time, stating, *"You take the number of employees you have, and I'm not talking about necessarily like, you know, I'm talking about knowledge workers and talking about fairly high billing rate employees, and you're taking away the least valuable part of their time" [P14].* This viewpoint underscored the optimisation of high-value human resources by automating less valuable aspects of their work, leading to increased efficiency.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Optimisation of Shared Services	**+**	**N**	**+/-**	**N**	**+/-**	**N**	**N**	**+**	**+**	**+/-**	**N**	**+/-**	**N**	**+**	**+**
Time Savings	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**
Potential Replacement of Human Activities	**+/-**	**N**	**N**	**+**	**+**	**+/-**	**N**	**+**	**+**	**+**	**+**	**+/-**	**+**	**+/-**	**+**
Optimisation of Employee Time	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.3.5 *Benefits of Process Mining Implementation*

The participant responses provided insights into the benefits associated with the implementation of Process Mining in their business. Participant 2 emphasises transparency as a key benefit, stating, *"Transparency into the actual execution of business processes is one of the most important ones" [P02].* This suggests that Process Mining brings visibility and clarity into how business processes are executed, enabling a clear understanding of the workflow.

Participant P04 underscores the value of data in understanding process execution, stating, *"Data will tell you exactly what's happening within that process" [P04].* This highlighted the data-driven nature of Process Mining, where analysing data provides precise insights into the dynamics and performance of business processes. Participant P07 outlines multiple benefits, including obtaining an objective view of how the business runs, discovering processes, highlighting areas for automation, and facilitating continuous improvement through root cause analysis. The participant stated, *"Objective view of how the business runs, the discovery of process, highlight areas automation candidates. Continuous improvements by implementing root cause analysis" [P07].* This reflected the broader impact of Process Mining on business operations, from objective observation to actionable insights for automation and continuous improvement.

Participant 11 focuses on measurement and discovery, stating, *"I think it is measuring the processes that they are interested in measuring, finding bottlenecks, finding things they haven't thought of" [P11].* This emphasised the capability of Process Mining to measure and analyse processes, identify bottlenecks, and uncover aspects that might not have been initially considered.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Transparency in Business Processes	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**+**	**+**	**+**	**+/-**	**+**	**+**	**+**	**+**
Data-Driven Understanding	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**

Objective View, Discovery, and Continuous Improvement	**+**	**+**	**+/-**	**+**	**N**	**+/-**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**
Measurement and Discovery	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+/-**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.3.6 *Benefits of Combined Implementation (RPA and Process Mining)*

The participants provided insights into the benefits of a combined implementation between Process Mining and Robotic Process Automation (RPA). Participant P01 highlighted the importance of understanding the correct use case for RPA implementation and the monitoring capability post-implementation to measure performance. The participant stated, *"Benefits for combined implementation will be to understand the correct use case to ensure the right RPA are implemented. Monitoring capability post-implementation to measure performance and conformance once implemented" [P01].* This underscored the significance of aligning RPA implementation with appropriate use cases and the continuous monitoring of performance and conformance facilitated by the combined implementation. Participant P07 emphasised the role of Process Mining in the discovery phase of an RPA project, stating, *"Mining can help a lot with the discovery phase in an RPA project. Typically, RPA projects are expensive. They take a bit of time if you must manually discover candidates for automation process" [P07].*

This pointed to the efficiency gained by using Process Mining in the discovery phase of RPA projects, especially in identifying candidates for automation more quickly and cost-effectively.

Participant P10 highlighted the potential of integration between Process Mining and RPA, stating, *"They talk to each other, so there is more potential, but whatever you can integrate" [P10].* This emphasised the advantage of seamless communication and integration between the two solutions, allowing for a more cohesive and effective implementation. Participant P12 discusses leveraging business value through combined implementation, stating, *"You would leverage the biggest business value out of such an RPA implementation project and with Process Mining,*

I think you can identify what is worth to become automated" [P12]. This suggests that Process Mining aids in identifying areas with the most significant business value for automation in the context of an RPA project.

Challenges	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	P14	P15
Efficiency in Discovery Phase	+	+	+	+	N	+	+	+	+	+	+	+	+	+	+
Strategic Use Case Understanding	+	+	+	+	N	+	+	+	+	+	+	+	+	+	+
Leveraging Business Value	N	+	+/-	+/-	N	+	+	+	N	+	+/-	+	+/-	N	+
Integration Potential	+	+	N	+	N	+/-	+	+	+	+	+	+	N	+	+

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.3.7 *Complexity of Combined Implementation*

The participant responses provided varied perspectives on the complexity of implementing Process Mining and Robotic Process Automation (RPA) combined. Participant P01 suggested that task mining is required as an additional tool to simplify the combined implementation. The participant highlighted, "*Task mining is required, which is another tool to simplify the combined implementation. It's becoming less complex depending on the tool you select" [P01].* This indicated that the complexity might be mitigated by using specific tools, and task mining is presented as a tool that could simplify the overall process.

Participant P03 acknowledged the complexity of the combined implementation, attributing it to the different technologies involved. The participant explained, "*It is quite complex because they have different technologies. First, you need access to the database structure to understand how the process's different parts are stored and moved in a source system and potentially across multiple source systems" [P03].* The challenges arise from the differences in technologies and the need for understanding the database structure, especially when dealing with multiple source systems.

Participant P09 expressed a contrasting view, stating that the complexity is not significant. The participant mentioned: *"The complexity is not really big. If you record, for example, in the RPA, some activities around an order, you must collect this reference. Then, to merge those events with the events you could capture in different systems after that, it's not really complex to use" [P09].* This perspective suggests that, under certain conditions, the process of recording and merging events may not be overly complex. Participant P04 presented a perspective that contradicts the notion of complexity, stating, *"I don't think it's complicated because I think they are two separate processes" [P04].* This participant identified the processes (Process Mining and RPA) as separate entities, implying that the complexity might be lower if treated as distinct activities. Figure 1 summarises the findings with the thematic map.

The findings of Research Question 1 shed light on the intricate dynamics of integrating Robotic Process Automation (RPA) with Process Mining in digital projects. Challenges related to data extraction, implementation complexities, and organisational resistance were identified. On the positive side, benefits such as optimisation of shared services, time savings, transparency, and data-driven insights emerged. The combined implementation was found to offer strategic advantages, but varying perceptions of complexity highlighted the need for careful consideration and additional tools. Understanding the interplay of challenges and benefits is crucial for organisations seeking to leverage the synergies between RPA and Process Mining in their digital projects.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Need for Additional Tools	**+**	**−**	**+**	**+**	**+/−**	**N**	**N**	**+**	**+**	**N**	**+**	**+**	**N**	**+**	**−**
Differences in Technologies	**+**	**+/−**	**+**	**+/−**	**+**	**+**	**+**	**−**	**+/−**	**+**	**+**	**+/−**	**+**	**+**	**+/−**
Varied Perceptions of Complexity	**+**	**+**	**+**	**+**	**+−**	**+/−**	**N**	**N**	**+**	**+/−**	**+/−**	**+**	**N**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

The research utilized inductive thematic analysis to investigate the connections between RPA and Process Mining Integration in Digital Projects. The data was collected from fifteen participants, and the coding process was designed to identify key themes and sub-themes. The findings were presented with supporting direct quotes from the transcripts, which strengthened the research's credibility (Braun & Clarke, 2012). The diagram below Figure 3 presents the research findings on the dynamics of RPA and Process Mining Integration in Digital Projects.

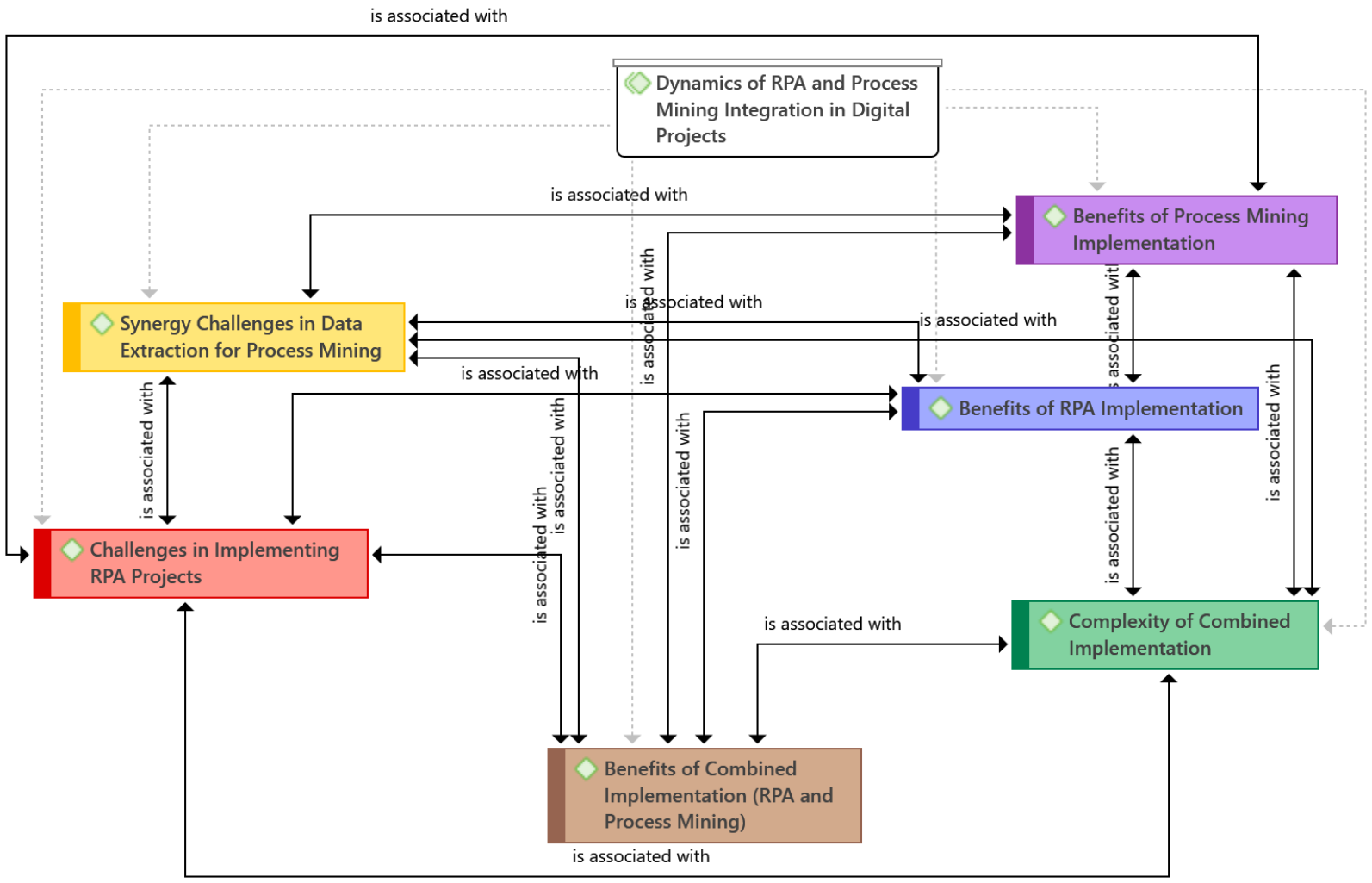

Figure 3: Dynamics of RPA and Process Mining Integration in Digital Projects

4.4 Proposition 2 and Proposition 3 – Results and Analysis

4.4.1 *Critical Success Factors for RPA Implementation with Process Mining in Digital Projects*

Research Question 2 aimed to identify the critical success factors for the implementation of Robotic Process Automation (RPA) with Process Mining in digital projects. The analysis of raw data, using inductive coding, led to the extraction of a comprehensive set of codes, specifically addressing Research Question 2.

These codes were subsequently refined and organised into subthemes and overarching themes, culminating in the identification of critical success factors for RPA implementation with Process Mining in digital projects. The overarching theme of the analysis is "Critical Success Factors for RPA Implementation with Process Mining in Digital Projects." This theme encompasses various dimensions, each contributing to the overall success of the integration. Table 3 gives a summary of the subthemes and themes.

Table 15: Critical Success Factors for RPA Implementation with Process Mining in Digital Projects

Subthemes	Themes
Comprehensive Understanding of Business Operation	Deriving Business Values: Key Factors to Consider
Contextual Variability	
Subjectivity of Business Value	
Context-Specific Business Value	Benefits of Implementing Digital Projects: Key Elements to Keep in Mind
Holistic Project Success	
Transformative Power of Automation	
Sound Business Case	

Subthemes	Themes
Proof of Value Session	Business Case Approval Process: Key Steps to Follow
External Triggers	
Strategic Application in Legacy Systems	RPA Projects: Key Differentiating Elements to Consider
Pre-Automation Analysis	
Comparative Dimension	
Operational Excellence	Motivators for RPA Implementation: Key Factors to Keep in Mind
Standardisation of Processes	
Holistic Improvement	
Automating Rule-Based Manual Work	Process Mining Projects: Key Differentiating Elements to Consider
Value of Data and Diverse Perspectives	
User-Centric Approach	
Addressing Bottlenecks and Compliance	Motivators for Process Mining Implementation: Key Factors to Keep in Mind
Continuous Improvement and Standardisation	
Context for Problem-Solving	
Leveraging Impactful Use Cases	Software Cost vs Use Cases: Key Considerations
Alignment with Integration Use Cases	
Regional Nuances	

4.4.2 *Deriving Business Values: Key Factors to Consider*

According to participant P02's perspective, a fundamental element for success in business is obtaining a comprehensive understanding of the business operation. *"I would say that one of the key success factors is having insight into your business*

operation because that will give you a handle on" [P02]. As suggested by the participant, this insight serves as a crucial factor, providing a practical handle on the intricacies of operations. The implication is that possessing such insight empowers individuals to navigate better and manage the various aspects of their business.

Participant 8 introduced a crucial contextual aspect to the discussion, highlighting the variability of key success factors based on the size and state of the business. The participant contends that the determinants of success are contingent on the specific circumstances existing at the point of implementation. *"The key Success Factors depend on the state of the business at the point of implementing this thing. For a small organisation, you know, the Success Factors could be very different from a very large organisation. The answer cannot be generalised" [P08].* This perspective challenges the notion of a universal set of success factors, emphasising the need for a tailored approach that recognises the diverse needs of small and large organisations.

Participant 15 expands on the idea of deriving business value, emphasising the role of personal experience and perspective. The participant suggests that the determination of business value is subjective and based on individual experiences. *"It can be based on your experience and the things that you look at to derive business value." [P15].* This statement underscores the participant's recognition that business value assessment is inherently shaped by the lens of personal encounters and the specific aspects one deems crucial in the evaluation process.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Comprehensive Understanding of Business Operation	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**
Contextual Variability	**N**	**+**	**+/−**	**+**	**+/−**	**+**	**+**	N	**+/−**	**+**	**+**	**+**	**+**	**+/−**	**+**
Subjectivity of Business Value	**+**	**+**	**+/−**	**N**	**+/−**	**+**	**+**	**+/−**	**+**	**+**	**+**	**+**	**+**	**+/−**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.3 *Benefits of Implementing Digital Projects: Key Elements to Keep in Mind*

The domain of digital projects brings forth a dynamic landscape where the realisation of business value is intricately tied to the specific use case in focus. A participant (P03) keenly observes that: *"Business value is going to completely change depending on the use case" [P03].* This insight acknowledged the diverse and context-specific nature of benefits underscored by the need for a nuanced understanding of the unique circumstances surrounding each digital project, recognising that the impact and value derived can vary significantly based on the application.

An important factor highlighted by another participant revolves around the significance of sponsorship, organisational commitment, and the human element. The participant emphasised, *"For me, it's always around the sponsorship, the organisation, the people, the methodology that it's all in place" [P07].* This perspective underscored the interconnected nature of successful digital project implementation. It suggests that beyond technological considerations, the backing of leadership, a supportive organisational culture, and a well-defined methodology are imperative for project success.

Furthermore, the theme of automation emerges prominently in the discourse, with a participant succinctly expressing the potential benefits. According to this insight, *"Automation and by means of automation making things simpler"* [P15] encapsulates a belief in the transformative power of automation. The participant implies that the simplification of processes through automation is a key outcome that can be achieved by integrating digital projects.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Context-Specific Business Value	**+**	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**N**	**+**	**+**	**+**	**N**	**+**	**+**
Holistic Project Success	**+**	**+**	**N**	**+/−**	**N**	**N**	**+**	**+**	**N**	**+**	**+**	**+**	**N**	**+**	**+**
Transformative Power of Automation	**+**	**+/−**	**+/−**	**N**	**+/−**	**N**	**N**	**+/-**	**N**	**+/−**	**+**	**+**	**N**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.4 *Business Case Approval Process: Key Steps to Follow*

In the approval process lies the imperative of presenting a compelling business case, as underscored by the participant: *"There needs to be a sound business case in terms of benefits and cost" [P01].* This foundational step requires meticulous consideration of both the anticipated benefits and associated costs, ensuring a comprehensive and compelling rationale for the proposed initiative. This insight emphasises the importance of a thorough and well-documented business case as the linchpin for obtaining approval. A pivotal moment in the approval process is illuminated by participant P05, who introduces the concept of a "proof of value" session. The participant described it as a typical practice, *"That's a typical way to like its session, the name proof of value. That gives confidence to whatever business case you come up with" [P05].*

This step serves as a confidence-building exercise, validating the feasibility and viability of the business case. Expanding the perspective to external triggers, participant P06 introduces a crucial external dimension to the approval process, stating, *"Whenever we receive any request for a proposal from the customer side" [P06].* This external cue underscored the need for agility and responsiveness, recognising that external demands and opportunities can initiate and shape the business case approval process. This external validation aligns the internal decision-making process with customer needs, enhancing the overall strategic alignment.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Sound Business Case	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**N**	**+**	**+**	**+**	**+**	**+/-**
Proof of Value Session	**+**	**+**	**+/-**	**N**	**+**	**+**	**+**	**N**	**+**	**N**	**+**	**+**	**+**	**+**	**+/-**
External Triggers	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+/-**	**+**	**N**	**+**	**+**	**+/-**	**+**	**+/-**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.5 *RPA Projects: Key Differentiating Elements to Consider*

Looking into the landscape of Robotic Process Automation (RPA) projects, participants highlighted key differentiating elements that should be considered for effective implementation. A fundamental consideration highlighted by one

participant centred around the nature of existing systems. In the context of legacy systems, the participant emphasised: *"Where you've got the legacy type of systems is where you would obviously utilise your automation" [P04].* This recognition underscores the strategic application of RPA, particularly in scenarios where legacy systems may pose challenges in terms of efficiency and integration. Conversely, the participant notes that digital systems inherently possess components that facilitate digitisation, potentially negating the need for explicit automation. This insight underscores the importance of aligning RPA initiatives with the specific technological landscape in which they operate.

Ensuring a thoughtful and strategic approach to automation is emphasised by participant P09, who asserted: *"You must be sure of the steps that you want to automate. You must, in fact, understand your process before you try to automate" [P09].* This perspective underscores the critical importance of a pre-automation analysis, advocating for a thorough understanding of the processes at play. It reinforces the idea that successful automation is contingent upon clearly comprehending the workflow, ensuring that automation is applied judiciously and precisely.

Participant P11 introduces a comparative dimension, drawing attention to the differentiation among RPA projects. The participant noted: *"So one project compared to another RPA project, or one RPA project compared to other solutions" [P11].* This insight prompts consideration of the unique characteristics that distinguish RPA projects from one another and from alternative solutions. It underscores the need for a tailored approach, recognising that the effectiveness of RPA can vary based on the specific context and objectives of each project.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Strategic Application in Legacy Systems	**N**	**+**	**+**	**+**	**+**	**N**	**+/-**	**+/-**	**+**	**+**	**+/-**	**+**	**+**	**+/-**	**+/-**
Pre-Automation Analysis	**+/-**	**+**	**+**	**+**	**+/-**	**N**	**+**	**+**	**+/-**	**+/-**	**+**	**+**	**+**	**+**	**+**
Comparative Dimension	**N**	**+**	**+**	**+**	**-**	**N**	**+**	**+**	**+**	**N**	**+**	**+**	**+/-**	**N**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.6 *Motivators for RPA Implementation: Key Factors to Keep in Mind*

Exploring the driving forces behind Robotic Process Automation (RPA) implementation reveals key motivators that participants deem critical for success. The perspectives shared shed light on the factors that organisations prioritise when venturing into the realm of automation. Participant 8 underscored operational excellence as the foremost motivator, emphasising the speed at which RPA can achieve it. The participant noted: *"The key motivators include the speed of achieving operational excellence #1 and then the chance to standardise the processes and less dependency on humans" [P08].* This insight highlights organisations' urgency in enhancing operational efficiency, with RPA positioned as a catalyst for rapid and transformative change. Additionally, the motivation to standardise processes and reduce dependence on human involvement reflects a desire for operational consistency and reliability.

In alignment with the quest for standardised operations, participant P13 echoed a similar sentiment: "*The motivation was really to get a standardised execution" [P13].* This emphasises a strategic alignment with standardised practices, suggesting that RPA is seen to achieve uniformity and precision in the execution of tasks. The pursuit of standardisation streamlines operations and contributes to improved quality and reliability. A broader perspective on improvement is presented by participant P15, who articulated, *"It's this hope for better, faster, cheaper processes" [P15].*

This statement encapsulates the overarching motivation for RPA implementation, focusing on the trifecta of improvement: better processes, faster execution, and cost efficiency. This holistic viewpoint suggests that organisations view RPA as a transformative force capable of simultaneously elevating multiple aspects of their operations.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Operational Excellence	**+**	**+/-**	**+**	**+/-**	**N**	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**N**	**+**	**+**
Standardisation of Processes	**+**	**+**	**N**	**+**	**N**	**+**	**+**	**+**	**+**	**+**	**N**	**+/-**	**+**	**+**	**+/-**
Holistic Improvement	**+**	**+**	**+**	**+**	**N**	**+/-**	**+**	**+/-**	**+/-**	**N**	**+**	**+/-**	**+/-**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.7 *Process Mining Projects: Key Differentiating Elements to Consider*

Process Mining projects have revealed distinct elements that participants deem crucial for differentiation and success. These insights shed light on key factors that organisations consider when delving into the domain of process mining. Participant P01 underscored a fundamental motivation for Process Mining projects: *"To automate rule-based manual work. People can do more meaningful work within the organisation, adding value to clients" [P01].* The participant emphasised that by automating such tasks, individuals within the organisation can redirect their efforts towards more meaningful work that adds value to clients. This insight aligns with the broader objective of enhancing efficiency and elevating the contribution of human resources to higher-value activities.

A nuanced perspective on motivation emerges from another participant who highlighted the importance of understanding the value data can bring and the desired method of utilising Process Mining. The participant noted: *"They understand what value their data could add and Process Mining as a capability in a method that they want to use, and then the other one is kind of from change teams and business areas that kind of know that there's a different perspective" [P03].*

This dual focus on data value and diverse perspectives suggests that successful Process Mining projects require a comprehensive understanding of both the potential value locked within data and the specific needs and perspectives of different organisational units. Participant P06 introduced a user-centric dimension, emphasising the importance of tool implementation ease. The participant articulated: *"If I'm a customer, I definitely would go for how easy the tool is to implement. So, I mean, is it really too technical, or is it whether the end user who is using this application will be able to navigate the system easily" [P06].* This user-centric consideration recognised that the success of Process Mining projects is not solely contingent on technical capabilities but also on the accessibility and usability of the tools for end-users.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Automating Rule-Based Manual Work	**+**	**N**	**-**	**-**	**N**	**N**	**+/-**	**N**	**+/-**	**+/-**	**N**	**+**	**+/-**	**+**	**+/-**

Value of Data and Diverse Perspectives	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**+/-**	**+**	**+**	**+**	**+**	**+**	**+**	**+**
User-Centric Approach	**N**	**+**	**+/-**	**N**	**N**	**+**	**-**	**+**	**+**	**+/-**	**N**	**+**	**+/-**	**+**	**+**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.8 *Motivators for Process Mining Implementation: Key Factors to Keep in Mind*

Exploring the motivations behind the implementation of Process Mining revealed key factors that participants consider essential for success. These insights provide a nuanced understanding of the driving forces propelling organisations toward the adoption of Process Mining methodologies.

Participant P10 highlights critical questions that drive the adoption of Process Mining, emphasising concerns related to bottlenecks in Key Performance Indicators (KPIs), conformity, and compliance. *"Questions of bottlenecks in terms of KPI, questions of conformity or compliance. Questions of the need to standardise." [P10].* This perspective underlines the strategic motivation to address operational challenges and ensure adherence to standards and regulations. Organisations aim to streamline processes and enhance overall operational efficiency by pinpointing bottlenecks and ensuring compliance. Participant P13 articulates a broader context of process improvement and standardisation. The participant notes, *"So it's process improvement, so the different improvement cycles are standardised typically in large companies that have multiple regions or are operating in multiple countries" [P13].* This viewpoint underscores the role of Process Mining as a catalyst for continuous improvement and standardisation, particularly in the complex operational landscapes of large organisations operating across multiple regions or countries. The motivation here lies in achieving harmonisation and consistency in processes. Participant P05 introduced a distinctive perspective on the value of Process Mining, emphasising its ability to provide context for problem-solving. The participant stated: *"I think the biggest thing with project mining is it provides context for a problem because it looks at a problem in the context of the process, so it gives the horizontal view right traditional BI focus on a problem but misses the game" [P05].* This insight highlights Process Mining as a tool that identifies issues and places them within the broader context of the entire process. It offers a holistic, horizontal view that

traditional Business Intelligence might miss, enabling organisations to address problems more comprehensively.

Challenges	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	P14	P15
Addressing Bottlenecks and Compliance	+	N	+	+	+	+	+	+/-	+	+	+/-	+	+	+	+
Continuous Improvement and Standardisation	+/-	+/-	N	+	+	+	+	+	+	+	+	+	+	+	+
Context for Problem-Solving	+	N	+	+	+	+	+/-	N	N	+/-	+/-	+/-	+	+	+

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

4.4.9 *Software Cost vs Use Cases: Key Considerations*

When evaluating the deployment of software in relation to cost and use cases, participants offered insights that underscored the strategic considerations organisations weigh in adopting these technologies. Participant P02 introduces a common approach where the initial cost of the software influences the selection of use cases. Acknowledging that the technology isn't inexpensive, the participant notes, *"Yeah, I think so... it's not a cheap technology. So, what you very often see is that customers look at the biggest use case first to justify the initial cost of process mining" [P02].*

This perspective reflects a pragmatic approach, where organisations prioritise the most impactful use cases to justify the upfront investment in the technology. It underscores the need for a compelling business case to align with the significant initial cost of the software. Expanding the focus to Robotic Process Automation (RPA), participant P11 draws attention to the consideration of real integration use cases and automation. The participant suggested: *"I think yes, especially by looking at RPA in that regard, if RPA is compared to real integration use cases and automation" [P11].* The emphasis was on assessing RPA against tangible integration scenarios and automation requirements. This implies a strategic evaluation where the alignment of RPA capabilities with specific use cases is crucial for optimising the software investment.

A regional perspective is introduced by participant P06, who noted that in certain regions like the Middle East, the emphasis may not solely be on cost considerations.

The participant stated: *"If you take one of the regions like the Middle East, they wouldn't be much bothered about the cost, but they would see how flexible the product is to implement the solutions" [P06].* This regional nuance underscores that flexibility and ease of implementation might outweigh cost considerations in certain contexts. It highlights the importance of adaptability and user-friendly features in technology selection.

Challenges	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**P11**	**P12**	**P13**	**P14**	**P15**
Leveraging Impactful Use Cases	**+**	**+**	**+**	**+/−**	**+/−**	**+**	**+/−**	**+/−**	**+**	**+**	**+**	**+/−**	**+**	**+/−**	**+**
Alignment with Integration Use Cases	**+/−**	**+**	**+**	**+/−**	**+/−**	**+**	**N**	**+/−**	**+**	**+**	**+**	**+/−**	**N**	**+/−**	**+**
Regional Nuances	**N**	**N**	**+**	**N**	**+**	**+**	**+/-**	**N**	**N**	**+/-**	**N**	**+/-**	**+**	**+**	**N**

Note. +: **valued,** −: **not valued,** +/−: **sometimes valued**; N: **not mentioned.**

The research utilized inductive thematic analysis to determine the key factors to consider for successful implementation of Robotic Process Automation (RPA) with Process Mining in Digital Projects. The research study collected data from fifteen participants; the coding was organized according to themes and sub-themes, and direct quotes from transcripts were used as evidence to back up the research findings (Braun & Clarke, 2012). Overall, the method will allow for a more detailed discussion of the findings and results, illustrating the factors that contribute to the successful implementation of RPA with Process Mining in Digital Projects. The diagram below Figure 4 presents the research findings on the Key Factors to Consider for Successful RPA Implementation with Process Mining in Digital Projects.

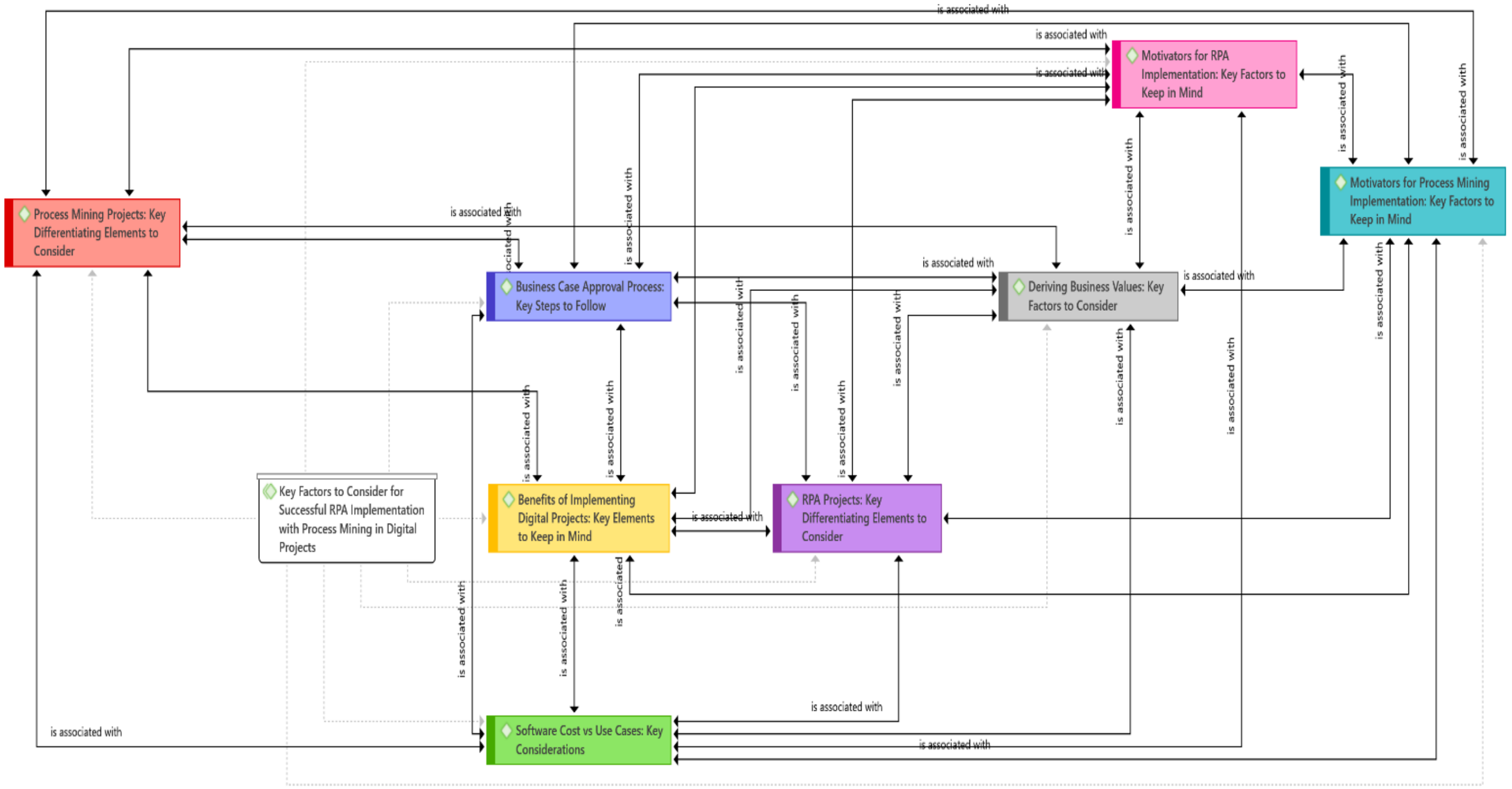

Figure 4: Key Factors to Consider for Successful RPA Implementation with Process Mining in Digital Projects

4.5 Conclusion

The in-depth discussion of Research Questions 1 and 2 provided insight into the challenging landscape of combining Robotic Process Automation (RPA) with Process Mining in digital projects.

Research Question 1 explored into this integration's challenges, benefits, and motivations. Challenges such as data extraction complexities, implementation hurdles, and organisational resistance were identified. On the positive side, benefits included time savings, transparency, and data-driven insights, while the combined implementation showcased strategic advantages. Varying perceptions of complexity emphasised the need for careful consideration and the potential use of additional tools. Understanding the interplay of these challenges and benefits is pivotal for organisations navigating the synergies between RPA and Process Mining in their digital endeavours.

Research Question 2 focused on unravelling the critical success factors for implementing RPA with Process Mining in digital projects. The identified factors ranged from gaining deep business insight and acknowledging contextual variability to strategic project success elements and meticulous business case approval processes. The strategic application of RPA, consideration of motivators, and recognition of the dynamic landscape of digital projects added layers to the understanding of success factors. This comprehensive insight serves as a valuable guide for organisations aspiring to seamlessly integrate RPA with Process Mining, fostering success in their digital initiatives. In conclusion, the findings from both research questions collectively contribute to a nuanced understanding of the complexities, challenges, and success factors inherent in the integration of RPA with Process Mining in digital projects.

CHAPTER 5. DISCUSSION OF THE RESULTS OR FINDINGS

5.1 Introduction

In this chapter, will delve into the discussions related to Proposition 1, Proposition 2, and Proposition 3. The aim is to compare the literature review against the research findings while also incorporating The Actor-Network Theory (ANT) to the discussions. Through doing this, the research aims to provide an in-depth analysis of the propositions, emphasising their importance and relevance to the key research topic.

5.2 Discussion pertaining to Proposition 1

Proposition 1: The proper selection of RPA and Process Mining use cases may lead to a successful digital project implementation, as well as shortened completion times and increased process efficiency. The successful implementation of RPA and Process Mining requires a defined business goal backed by important stakeholders, as well as the use of change management methods to position and market the solution and the benefits of implementing the solutions. Clear business drives for RPA and Process Mining will help in measuring project success.

5.2.1 Selection of Use Cases

The first element is to examine the selection of use cases for RPA and Process Mining. If the use cases are well-chosen and aligned with business goals, they are more likely to lead to successful digital project implementation, shortened completion times, and increased process efficiency.

The business case selection and approval process are a crucial step in addressing business challenges as it involves identifying the problem, assessing the cost, and determining which solutions are required. The validation process is critical for fostering collaborating and ensuring that the business case is accurate.

External influences such as customer needs, access to opportunities, and innovation may impact the approval process. External validation of a business case must be in line with the internal decision-making processes and business needs.

The ANT Framework was utilised in this study to engage with network actors for *Problematization*, especially human actors, in identifying important challenges and business needs (Plattfaut et al., 2022). To begin, the study examined both the benefits and challenges of implementing RPA and Process Mining separately. The research further looked at the benefits of implementing both solutions at the same time, which made the ANT Framework a suitable option for the use case selection and approval process.

The research findings revealed that to select the right use case for RPA and Process Mining, the organization must first understand current business challenges that could potentially be addressed by implementing RPA and Process Mining. Previous research suggests that RPA use cases should include repeated manual processes to increase productivity and minimize errors, which ultimately decreases operating costs (Osman, 2019). The selection of use cases for Process Mining needs to focus on analysing historical data of process executions in the form of event logs, which can provide fact-based insights and support process improvements by discovering process models and other relevant data that can identify bottlenecks and process compliance (Yasmin et al., 2018).

5.2.2 *Defined Business Goals*

The second element is to assess whether the business goals for implementing RPA and Process Mining are clearly defined and supported by important stakeholders. If the business goals are well-defined and supported, they are more likely to lead to successful project implementation.

Based on the research findings, defining business goals is closely related with generating business value and understanding how an organization provides value. According to Mooney et al. (1995), business value is determined by two

factors: business processes and the impact of IT on operations. When implementing a digital project, it is critical to assess the organization's landscape through an understanding of business processes, applications, and people. The impact of implementing solutions on the business itself, its capabilities map, its potential for overall adoption, and the long-term costs of maintaining the solution must all be assessed as well. Defining business goals must be anchored to how the business will generate value and the impact of project success on the organization.

That can help obtain executive sponsorship, as well as financial support for the tools and business ownership. Sponsorship could influence how the tools are perceived by the organization, potentially leading to business buy-in and successful implementation of RPA and Process Mining.

5.2.3 Change Management Methods

The third element is to evaluate the use of change management methods to position and market the solution and the benefits of implementing the solutions. If change management methods are effectively used, they are more likely to lead to successful project implementation.

The research findings indicates that lack of RPA and Process Minig adoption occurs when the impact of automation and process optimisation is not properly articulated, and there are gaps in scope RPA and Process Mining initiatives and the changes will impact the current stakeholder who performs the tasks being automated and optimised. If RPA is positioned as a tool that will replace humans, it will cause resistance; but, if RPA is positioned as a tool that will take a portion of tedious tasks and allocate relevant work to humans, that resistance issue will be managed. To avoid resistance in adopting the implementation of RPA and Process Mining the organisation should consider incorporating the change management model such as Mento’ change model “proposes a 12-phase approach to successfully implementing and managing change initiatives. These include determining the idea and its context, defining the change initiative, evaluating the climate for change, developing a change plan, identifying a

sponsor, preparing change recipients, creating cultural fit, developing and selecting the change leadership team, creating small wins for motivation, constantly and strategically communicating the change, measuring change progress, and integrating lessons learned" (Errida & Lotfi, 2021).

Incorporating change management strategies into the implementation plan is critical to ensuring that the benefits of RPA and Process Mining are properly articulated and clarified within the organization. This will assist the organisation understand the importance of the change effort, minimize resistance to change, and improve the chances of successful implementation.

5.2.4 *Clear Business Drives*

The fourth element is to determine whether there are clear business drives for RPA and Process Mining, which will help in measuring project success. If there are clear business drives, they are more likely to lead to successful project implementation.

The literature review conducted by Syed et al. (2020) to established the business drivers for implementing RPA and Process Mining. These business drivers include cost-cutting measures, improving the quality of work, improving customer interactions, and fulfilling compliance requirements. Understanding these business drivers allows organisations to better align their digital initiatives with their overall business goals and objectives.

According to a literature review carried out by Syed et al. (2020), implementing RPA and Process Mining may provide multiple benefits to organizations, such as cost savings, improved quality of work, improved customer service, and regulatory compliance requirements. Organizations have to understand these business factors to match their digital initiatives with the wider business objectives and goals.

Based on research findings, for an organisation to achieve business drivers such as cost savings and improved work quality, common processes that may be

causing issues must be identified. Performing this task can help organizations discover how to improve across the organization as well as benefit from shared services. Effective implementation of RPA and Process Mining projects can additionally help organisations establish shared services, allowing them to optimize their processes and align their business goals with their digital initiatives. According to Lacity and Willcocks (2016), shared services should be centralized, standardized, and optimized before automation.

In order for an organization to benefit from an RPA and Process Mining shared service, common processes must be planned out i.e. centralized, standardized, and optimised before initiating robotic process automation. The optimisation of shared service will enable the organization to derive the value quickly and to align business goals with digital initiatives.

5.2.5 Measurable Outcomes

The fifth element is to assess whether the outcomes of implementing RPA and Process Mining are measurable. If the outcomes are measurable, it will be easier to determine whether the project has been successful.

The literature review by Vukadinović and Fabac (2022) emphasizes the importance of choosing the right approach to digital transformation, which could include focusing strategy, processes, structure, project management, and other performance-related elements. When implementing RPA with Process Mining, it is important to first identify a pain point or issue that the organization seeks to address. In order to evaluate project success, the organization must align and realize business needs and implementation successful outcomes.
The research finding reveal that measurable outcomes that can be used to assess the successful implementation of RPA and Process Mining are.

- *Cost and time savings* could be a utilized as a measurable outcome for RPA with the robots completing the task, the work is carried out quickly as well as accurately, improving the time to execute tasks and the related cost of labour to the process (Lacity & Willcocks, 2016).

- *Optimisation of Employee Time* could be a utilized as a measurable outcome for RPA provides individuals more time to focus on other activities and re-skill in other critical skills required for their line of work. Employees spend more time interacting with customers, which improves customer satisfaction (Osman, 2019).
- *Potential Replacement of Human Activities* could be a utilized as a measurable outcome for RPA has the ability to replace human-driven tasks in which a user has to carry out a specific task involving an interaction with a system or tool. The process must be repetitive, prone to human error, and high in volume. A suitable example would be invoice processing or payments. If an invoice needs to be issued on monthly basis, using the same tools then a robots could be assigned to perform invoice processing. Businesses can choose whether to use an attended robot, in which humans may supervise what's being done, or an unattended robot, which can perform duties without human supervision.
- *Improve accuracy through standardisation of processes* could be a utilized as a measurable outcome for both RPA and Process Mining, most standardized processes end up generating standardized tasks that can be supported by a proper technical solution (Trkman, 2010). As stated by Küng and Hagen (2007), “BPM systems can lead to more uniformity since processes are carried out per specifications rules, and guidelines”. The standardization of processes should be part of a strategic alignment to ensure uniformity and accurate execution of tasks while implementing RPA. Process standardization increases operational reliability and accuracy in the services and products provided by organizations.
- *Holistic process improvement* could be a utilized as a measurable outcome for Process Mining, based to the author Benraad et al. (2022), "without process performance metrics, it can be difficult to spot areas of process improvement". To understand areas for improvement for specific process performance metrics, they should be defined. This allows business to determine when processes are being performed correctly. Holistic improvement helps the business to establish the standard for best process performance, accelerated execution, along cost efficiency. This holistic

approach can be used as measurable outcome for success implementation of Process Mining can determine the candidates for RPA by identifying processes with the most bottlenecks and process check for compliance, which can ultimately improve efficiency before implementing RPA (Osman, 2019).

- *Process compliance* could be a utilized as a measurable outcome for Process Mining, enabling the discovery of rule-based processes as well as deviations from process conformance criteria. Depending on data insights, it can suggest potential automation candidates for specific processes, aligning with business goals of improving efficiency and increasing the value of human resources. The primary goal of Process Mining is to discover processes, check compliance, identify bottlenecks, and compare process variations using event data (Van der Aalst, 2016). This method can assist detect excessive rework and delays while also providing insights into bottlenecks, predicting processes, tracking process violations, proposing alternatives, and optimising the process.
- *Ease of implementation* is a measurable outcome of implementing RPA and Process Mining, which assist organizations in discovering relevant performance indicators and improving business operations and processes (Van der Aalst, 2016). Businesses can be accomplished their process improvement goals by implementing powerful use cases and lining them to integration use cases. For example, reducing customer onboarding time can shorten the time required to onboard the customer while improving process quality. It is important to always assess business value when using tools to support strategic initiatives. When the solution comes with a formulated use case, it is comparatively straightforward to justify the financial investment in the technology. It is also critical to consider regional nuances such as deployment preferences, language, and cultural differences. The simplicity of implementation and flexibility could outweigh the financial cost of the technology. This nuance emphasises the importance of flexibility and simplicity of use in technological selections, which can sometimes outweigh financial considerations. Technology vendors need to take into account geographic differences and adjust the solutions they offer accordingly to cater to the different needs of customers.

The research identified five key elements for successful implementation of RPA and Process Mining: proper selection of use cases, defined business goals, change management methods, clear business drives, and measurable outcomes. The research emphasizes the importance of understanding current business challenges, defining business goals, and using change management models to position the solution and benefits of implementing RPA and Process Mining. Measurable outcomes such as cost and time savings, optimization of employee time, replacement of human activities, standardization of processes, holistic process improvement, process compliance, and ease of implementation can help assess the success of implementing RPA and Process Mining.

The research supports the Proposition 1 that these elements can lead to a successful digital project implementation, shortened completion times, and increased process efficiency.

5.3 Discussion pertaining to Proposition 2

Proposition 2: The outcomes and benefits of organisations aiming to implement RPA and Process Mining may differ depending on the process selected, the system interfaces, the business requirements, and the organisational culture that may contribute to the adoption of the solutions.

5.3.1 *Outcomes and benefits of organisations*

The first element is to examine the outcomes and benefits for the implementation of RPA and Process Mining. if the relevant outcomes are identified, benefits are properly defined and aligned with business goals, they are more likely to contribute to the adoption of the solution.

The literature review highlighted by Mooney et al. (1995), indicates that outcomes and benefits drives business value which, cantered on two factors: business processes and IT impact on operations. To derive business value, there must be alignment between business and IT. Implying there must be clear understanding of what the business needs are, and IT is supporting the business needs with the correct tools, business value can be generated.

Based on research findings indicates the *comprehensive understanding of business operation* is required, deriving business value always refers to how business operations are interconnected to IT and business. It has been discovered that business operations must always align with the organization's strategic objectives. All business initiatives must support the strategic objectives. Even from a digital transformation perspective, initiatives must align with business initiatives. Business must ensure that all business initiatives are clearly defined and outlined, especially the business process, which identifies what functions will be performed, who will be responsible, what data will be required, and what systems will be used. This includes identifying what functions will be performed, who will be responsible, what data will be required, and what systems will be used. This understanding will create a clear image of the business operations and help businesses generate value by identifying opportunities for improvement.

When implementing digital projects such as RPA and Process Mining, it is important for businesses to assess the current technological landscape, taking into account factors like business impact, capabilities mapping, utilization, collaboration, and maintenance costs. The outcome of this assessment will be a technology landscape, capability map, and financial estimations, which will help organisation to prioritize important strategic initiatives. By doing so, businesses can ensure that they are deriving business value from their RPA and Process implementation projects.

5.3.2 *Selection of process*

The second element is to examine the Selection of process for the implementation of RPA and Process Mining. If for RPA and Process Mining. if the relevant process is selected and aligned with business goals, they are more likely to contribute to the adoption of the solution.

The literature study indicated the challenges associated with selecting a process while implementing RPA. According to Gupta et al. (2022), organizations struggle with understanding how RPA works, which processes to implement, and the impact of implementing RPA on the organisation. Furthermore, determining which tasks to automate using both robots and humans and which processes to automate on the back-end or customer-facing end is challenging (Agostinelli et al., 2019). RPA development is frequently done by trial and error, and there is typically no testing environment that can generate testing scenarios, limiting the number of scenarios that can be examined (Agostinelli et al., 2019). It is particularly challenging to scope an RPA project since RPA requires relatively straightforward processes with little or no deviations.

Organisations, as well on the other hand, may automate the straight-through process and exclude deviation and expectations if a process is repetitive, high-volume, prone to human error, and has certain variations (Agostinelli et al., 2019). Finally, organizations struggle with determining what form of robot to use: attended or unattended. Attended robots require ongoing human involvement, whereas unattended robots work independently and without involvement from

humans (Agostinelli et al., 2019). Organizations must determine which type of robot is most appropriate for the task at hand.

The findings of the research indicate the challenges encountered while selecting a process for Process Mining implementation. According to Van der Aalst (2016), discovers that *data extraction* has an important influence on process selection given that Process Mining is mainly based on data and creates challenges for process miners when accessing it (Van der Aalst, 2016). The *complexity of collecting data from multiple sources* can be a major issue, as systems may use incompatible data formats that are inadequate for Process Mining.
Another key consideration when selecting a process for Process Mining implementation is the *influence of unstructured data*, which can come in the form of free text, audio, or video. Transforming this data into meaningful event data might be difficult, and eventually, affect the selection process for Process Mining implementation (Van der Aalst, 2016).

To adequately analyse and measure process performance indicators and other dimensions, there must also be a *sufficient number of cases and activity* occurrences during a specified time period. The relevant process will not be selected unless sufficient quantities and quality of data are provided. Furthermore, while selecting a process for Process Mining implementation, consider the diversity of data granularity, project scope, and the level of granularity of the event log or data source.

The ANT Framework was utilised in this study to engage with network actors, the *Interestment*, which focuses on the non-human actors, critical success factors were identified throughout the research to understand what makes RPA and Process Mining implementation successful and what causes them to not succeed (Plattfaut et al., 2022). As a result, the types of processes required for RPA and Process Mining projects, as well as the data quality, were identified as critical factors in determining whether or not the project succeeded.
A successful implementation of RPA and Process Mining deployment depends on selecting the appropriate process. Organizations face challenges with understanding RPA, selecting which tasks to automate, and selecting a suitable

robot type. RPA development is often restricted by trial and error. The challenges of Process Mining include extracting data from multiple sources and managing with unstructured data. Sufficient data quantity and quality must be addressed while analysing and measuring process performance indicators and other parameters. Selecting the right process which is aligned with business goals contributes to increasing solution adoption.

5.3.3 *System interfaces*

The third element is to examine the system interfaces for the implementation of RPA and Process Mining. If for RPA and Process Mining. if the relevant system interface is implemented and aligned with business goals, they are more likely to contribute to the adoption of the solution.

The literature study indicated the challenges associated with selecting a process while implementing RPA and Process Mining indicated that .the development approach of system interface for the implementation of RPA and Process Mining should be structured to allow for scalability and migration of bots to other platforms, extraction of data from other sources and integration with other solutions. (Plattfaut & Borghoff, 2022)

Based on the findings of the research, determining system interfaces was challenging due to the automation and extraction of data from legacy and bespoke systems with inaccurate information. Van der Aalst (2016) suggests that implementing strategic applications in legacy systems, as well as potential integration, could contribute to increasing RPA and Process Mining adoption.

According to Van der Aalst (2016), further emphasizes the importance of assessing existing processes and tools for maintaining operations from legacy systems before embarking on the RPA and Process Mining project. Determining if RPA is the suitable approach to automation to meet business goals is important. Adoption of strategic RPA may cause issues with efficiency and integration, especially with legacy systems. Therefore, it is critical to align RPA and Process

Mining projects with the unique technological landscape to ensure compatibility between the proposed solution and the current legacy systems.

The research utilised the ANT Framework to engage with network actors for *Enrollment*. Syed et al. (2020) evaluated critical factors for implementing RPA and Process Mining projects and discovered that implementation and integration were key factors for successful implementation. Syed et al. (2020) stated that it is reasonably easy and cost-effective to implement, with a shorter time frame of up to six weeks to production, although this may vary depending on the type of technology implemented. To successfully implement digital initiatives Vukadinović and Fabac (2022) reiterated the importance of selecting the right approach to digital transformation and aligning RPA with Process Mining to a business pain point or challenge the organization is seeking to address.

RPA and Process Mining can integrate with complex business systems by implementing a mechanism for collecting data from multiple sources and using RPA to automate repetitive activities, which may be transferred to Process Mining for analysis. This integration potential might significantly improve organisational effectiveness and data analysis.

5.3.4 *Business requirements*

The four element is to examine the business requirements for the implementation of RPA and Process Mining. If for RPA and Process Mining. if the relevant business requirements defined and aligned with business goals, they are more likely to contribute to the adoption of the solution.

The business requirements are important to the success of any project due to the fact that have a direct relationship to business goals and the creation of business value. The ANT Framework emphasizes the importance of identifying key challenges and business needs when defining business requirements (Plattfaut et al., 2022).

It is important to highlight the challenges that the organisation is experiencing and how they are negatively impacting the organization's effectiveness. The research

findings highlight the importance of selecting a suitable business case to generate business value. In order to fulfil business requirements, these must be properly specified. This includes determining the business processes, data needed, project sponsor, project implementation cost, and required technologies.

All these elements are related, and all contribute to a proper selection of the business case. To ensure the project's success, it is important to select a business case that is aligned with the organization's goals and strategies. It additionally improves the possibility of the project generating business value as well as contributing to the adoption successful implementation of RPA and Process Mining.

5.3.5 *Organisational culture*

The fifth element is to examine the organisational culture for the implementation of RPA and Process Mining. If for RPA and Process Mining. if the organisational culture defined and aligned with business goals, they are more likely to contribute to the adoption of the solution.

The Benraad et al. (2022) defined organizational culture as shared fundamental beliefs, attitudes, or ideas that result in the adoption of solutions. Benraad et al. (2022) maintains that process optimization should be a culture in the organization, which may be viewed as a key business capability to drive and guide the attitude and behaviour of employees that form the organization.

The ANT Framework highlights the importance of *Mobilization* for developing organisational culture, as Benraad et al. (2022) emphasizes that it is essential of establishing process optimization as an organizational capability. The framework also emphasizes the importance to formulate a Centre of Excellence (CoE) to ensure that operational and strategic operations are managed effectively to achieve success in mobilizing the business to embrace new ways of working (Herm et al., 2023).

The CoE will also ensure that new initiatives related to process improvement, which may be related to RPA and/or Process Mining initiatives, are prioritised, as well as that standard methods and techniques to be followed when implementing the solution are developed, as well as that relevant stakeholders are trained to develop and use the solutions implemented (Herm et al., 2023). The implementation of RPA, Process Mining, and digital initiatives requires a defined strategy and a suitable use case for both RPA and Process Mining.

Based on the research findings, it is reasonable to suggest that the successful implementation of RPA and Process Mining initiatives requires a well-defined business case, a clear understanding of business requirements, and the formation of a CoE to ensure that operational and strategic activities are carried out appropriately. This will ensure that the organization is able to successfully adopt new ways of working while achieving its desired business outcomes.

The research supports Proposition 2, which suggests that the outcome and benefits of an organization aiming to implement RPA and Process Mining may be influenced by several factors. These factors include the selection of process, system interface, business requirements, and organizational culture. It is important to note that these elements may contribute positively or negatively to the adoption of the solutions. These factors can influence solution adoption, both positively and negatively. To take full advantage of the benefits of RPA and Process Mining and guarantee their effective adoption, organisations must carefully assess all these factors before implementation. To take full advantage of the benefits of RPA and Process Mining solutions and guarantee effective adoption, organizations need to carefully assess these factors before implementing them.

5.4 Discussion pertaining Proposition 3

The executive's support for participating as an advocate and supporting the implementation of RPA and Process Mining may result in business users adopting and embracing the technologies. To have a greater adoption rate among

business users, the use case selection must align with the strategic goals as well as support the identified business drivers in the organisation.

5.4.1 *Executive support and advocacy*

The literature review conducted by Plattfaut and Borghoff (2022) indicated, executive support has been highlighted as an important success factor for effective change management processes. The support from leadership ensures that RPA and Process Mining initiatives are prioritized, that operational and technological resources are available, and that suitable RPA and Process Mining processes have been identified. Furthermore, successful implementation required executive sponsorship for the project, employees participation, promoting for the inclusion of other business stakeholders, and the identification of important resources (Mamudu et al., 2022).

The executive support and participation may have an impact on the solution's implementation in terms of development and performance monitoring for RPA and Process Mining. In addition, ensure the right stakeholders, including process experts, are involved while developing and configuring the solutions. The executive support may assist with driving a structured approach to adoption, which is an important factor for successful implementation and continuous improvement (Mamudu et al., 2022). This includes the approach utilized to collect data, design the process of analysis, and identify areas for improvement.

Obtaining executive sponsorship and participation is important for ensuring appropriate business value and overall project success. This includes both financial sponsorship of the tools and business ownership. The sponsorship and participation of the executive can influence how businesses perceive the solutions, perhaps increasing organisational buy-in. The approach to change has a significant impact on how organisations participate in utilizing the solutions and how employees become informed and prepared for changes in the future. To be successful, digital initiatives require leadership support, a supportive organizational culture, and a well-defined approach.

The research review highlights the need for executive support and involvement in the successful implementation of RPA and Process Mining technologies. The selection of business cases must be aligned with the strategic goals of the business and when business users understand the business value and benefits of the solutions, it may significantly improve how they perform their duties, ultimately leading to improved adoption of technology and acceptance.

The executive participation can help validate business requirements, shape the implementation approach, and guarantee resource availability, all of which are critical factors for successful RPA adoption. Furthermore, the use case selection must be aligned with the strategic objectives of the business, and the identified business drivers must be supported to ensure relevant business value and contribute to the overall success of the project.

The research supports Proposition 3, which suggests that when the executive actively supports and promotes the implementation of RPA and Process Mining, business users are more likely to adopt and embrace these technologies. The reason is that the executive's participation assists with aligning the use case with the organization's strategic goals and ensures that all relevant business drivers are taken into consideration in the implementation plan.

5.5 Conclusion

The discussion on Proposition 1 determined that for the successful implementation of RPA and Process Mining requires a proper selection of use cases, clearly defined business goals, change management methods, measurable outcomes, and a thorough understanding of current business challenges.

The discussion of Proposition 2 determined that process selection, system interface, business requirements, and organizational culture may all have an influence on the outcome and benefits. Organizations ought to carefully consider these elements before implementing RPA and Process Mining technologies.

Finally, the discussion on Proposition 3 determined that the executive's active support and promotion can help align the use case with the organization's strategic goals and increase the possibility of adoption by business users.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This final chapter of the research discusses the conclusions from Research Questions 1 and 2. The aim is to correlate the research questions with the propositions and propose recommendations and suggestions for future research studies.

6.2 Conclusions regarding research question 1

Research Question 1: What are the benefits, potential challenges, and motivations for implementing RPA with Process Mining in digital projects compared to individual implementations?

The research question 1 focused mainly on understanding the benefits, challenges and motivations of the respective solutions, to determine the purpose for each solution.

Based on the research question 1, the research concluded the benefits of RPA as increased productivity, reduced errors, reduced operational costs, time savings, and potential human activity substitution. The additional benefits different from the previous research literature were optimization of shared services, employee time optimization, improve customer satisfaction by providing employees more time to focus on other important duties. These additional benefits add a different perspective into what the organization can accomplish with a successful implementation of RPA.

The research concludes with the challenges that organizations experience when implementing RPA. These challenges include a lack of understanding of how RPA works and how it impacts the organization, accessibility of data, testing scenarios, project scope, differentiating between attended and unattended bots, and organizational opposition. RPA development is typically done through trial and error, with no testing environment. In addition, RPA adoption is inadequate

due to a lack of information exchange on the impact of automation and the role of robots. These challenges are in line with the challenges highlighted in the literature review by Gupta et al. (2022), however the research identified additional challenges different from the previous literature review i.e.. differentiating the robot types which can impact on the implementation approach and the adoption rate within the organisation depending on how the solution is positioned.

The overall benefits of Process Mining are that it improves organisational efficiency and effectiveness by increasing transparency in business processes, data-driven insight, objective views, continuous improvement, and measurement and discovery, allowing for the identification of bottlenecks and compliance issues, collecting data from multiple sources, and discovering anomalies and inefficiencies.

The research concludes with the challenges that organizations experience when implementing Process Mining were related to data extraction, the complexity of multiple source systems, the impact of unstructured data, data quantity and quality, and data granularity a diversity. Data quality is critical for successful Process Mining, and the breadth and granularity of the event log or data source influence its performance. The research literature highlighted the data protection aspect, "which poses a problem where sensitive data must be shared and/or protected" (Reinkemeyer, 2020). However, it's also important to note that accessing the right data with sufficient details to provide meaningful insights can also be a major challenge.

The research conclude that combined implementation of RPA and Process Mining helps in identifying potential RPA candidates and improve operational efficiency. The overall benefit for the organisation is optimizing business processes, simplifying IT implementation, and generating and analysing business value. The overall challenges for combined implementation of RPA with Process Mining are data format compatibility, the need for additional tools, and technological differences. Currently, there is a lack of market for technologies that combine RPA with Process Mining, with the majority being stand-alone and requiring synchronisation. Regardless of these challenges, the combined

implementation of RPA and Process Mining is critical to generating business value and improving effectiveness in organisations.

Research Question 1 was seeking to address the benefits, challenges and motivations of implementing RPA with Process Mining in digital projects compared to individual implementations. Based on the conclusion of Provision 1, RPA with Process Mining implementation requires proper selection of use case, defined business goals, change management methods, clear business drivers and measurable outcomes these elements can lead to a successful digital project implementation, shortened completion times, and increased process efficiency.

RPA and Process Mining implementation requires a formal and structured approach which in digital projects may not be case. In conclusion, the measurable outcomes and business driver corresponds to the benefits and motivation of the RPA and Process Mining implementation which are critical for the successful implementation.

6.3 Conclusions regarding research question 2

Research Question 2: What are the critical success factors for implementation of RPA with Process Mining in digital projects?

The research question 2 focused mainly on understand the critical success factor for implementation of RPA with Process Mining in to order to understand what cause these projects to succeed or fail. Based on research question 2, the critical success factors for the successful implementation of RPA and Process Mining in digital projects includes aligning business goals, business requirements, system interfaces, organizational culture, and management support. These factors may influence how organisation establish governance, compliance, implementation approach, required skills, and the impact RPA within the organisation (Plattfaut & Borghoff, 2022).

Based on the research question 2 findings, it is possible to conclude that the factors that influence critical success factors are also closely associated with the outcomes and benefits of organisations implementing RPA and Process Mining, especially process selection, system interface, business requirements, and organisational culture. Proposition 2 was effectively proved, and factors pointed out in the study correspond to those found in the literature review. However, it was discovered that the selection of the process, the organisational culture and the impact of emerging technologies on the current technology landscape had a major impact on the outcome of the implementation and adoption.

The research question 2 cover the other aspect of Proposition 3 which is the executive support and advocacy, which was highlighted in the literature review as management support and stakeholder involvement. These factors support and prove the Proposition 3 that participation and support from executives promotes the implementation of RPA and Process Mining, encourages business users support which promotes solution adoption and embracing these technologies. The research concluded that the executive participation is a fundamental success factor as this leads to validation of business requirements, shaping the

implementation approach, and guarantee resource availability. Which are critical for the success implementation of RPA and Process Mining.

6.4 Recommendations

The results of the research demonstrated that combined implementation of RPA and Process Mining can help identify potential RPA candidates and improve operational efficiency, resulting in optimized business processes, simplified IT implementation and increased business value to the organization. Additionally, the role of RPA with Process Mining is to accelerate the process optimization in digital projects.

Here are some recommendations for organisations intending to implement RPA and Process Mining:

6.4.1 *Define Data Strategy*

The recommendation for organisations looking to implement RPA and Process Mining is to formulate a well-defined data strategy that includes important details such as how data should be kept and processed, data provision policies, data consolidation, and governance (Levy, 2018). The data strategy will help solve some of the data challenges identified by the research such as managed complex data from multiple sources, establishing how to manage unstructured data, define the Understanding this information allow organisations manage their data more effectively and make informed decisions.

6.4.2 *Establish Centre of Excellence Team*

The recommendation for organisations considering in implementing RPA and Process Mining is to establish a Centre of Excellence (CoE) team in beforehand. The CoE team will be in responsible for driving the identification of new initiatives, managing existing ones, prioritising initiatives, and defining standard methods and techniques for implementing solutions. In addition, the CoE team will ensure the relevant stakeholders are trained to develop and use the solutions implemented (Herm et al., 2023).

6.4.3 *Executive support*

The recommendation for organisations considering implementing RPA and Process Mining is to secure executive support. To successfully implement RPA and Process Mining projects, valuable executive support is required to assess business needs, shape the implementation approach, and guarantee resource availability. Executive support can help ensure that the organisation's business goals are in alignment with technology and business requirements.

6.4.4 *Deployment options*

The accessibility and simplicity of a solution are important for its adoption. As well, the study also demonstrated that the benefits and business value of RPA and Process Mining solutions can outweigh their financial costs. However, when delivering solutions, technology providers must take into account regional differences such as language, cultural nuances, and deployment preferences. This will allow them to cater to the different needs of their customer base. It is important to note that the majority of RPA and Process Mining solutions are Software as a Service (SaaS), which could pose a challenge for organizations with restricted data security policies that prohibit data storage beyond their preferred location.

6.5 Suggestions for further research

Based on the research findings and observations, the following suggestions for future research are proposed:

- Further research should focus on the sustainability and maintainability required by organizations to ensure the successful implementation of RPA and Process Mining.
- Investigate the impact of automating processes discovered as potential candidates from Process Mining.
- Examine the impact of CoE teams for process optimization initiatives.
- Examine the influence of unattended robots on organizational process optimization.

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APPENDIX A – Research instrument

(1) Participant demographic information

1. What is your present role title?
2. How long have you been in your present role?

☐Less year ☐1 to 2 years ☐2 to 4 years ☐More than 5 years

3. What is your degree of education?

☐National Senior Certificate (Grade 12)

☐Higher Certificate or Advanced National Certificate.

☐National Diploma or an Advance Certificate

☐Bachelor's Degree or Advanced Diploma

☐Honours Degree, Postgraduate Diploma and Professional Qualification

☐Master's Degree

☐Doctoral Degree

4. How many years' experience using RPA?

☐Less year ☐1 to 2 years ☐2 to 4 years ☐More than 5 years

5. How may years experience using Process mining?

☒Less year ☐1 to 2 years ☐2 to 4 years ☐More than 5 years

(2) How to utilize RPA in combination with Process Mining to successfully

RPA Implementation

6. What is the process of selecting use cases for RPA implementation?
7. How many RPA process have you implemented? Please provide more details
8. What are the types of RPA robots you have deployed? Please provide more details
9. How do you decide in the types of interactions to record and automate?
10. Why do select specific interactions and not others?
11. How efficient are the tasks performed by the robots?
12. how are you measure the accuracy of the process automation?

Process mining implementation.

13. What is the process of selection use case for Process mining implementation?
14. How have implemented the Process mining solution?
15. What are you currently using Process mining for?

16. How have you derived the value from the solution?
17. How many data sources are you using? Please provide details of the data sources.

Integrated implementation between RPA and Process mining

18. Why have you decided on combining RPA and Process mining?
19. What are the benefits to business and IT by combining the solutions?
20. What are the identified barriers to implementation for both solutions?
21. What is the common use case that you have implemented for both RPA and Process mining?
22. How do you use the user interactions recordings from RPA in Process mining?
23. How has the RPA and Process mining simplified your duties?

(3) What are the benefits, potential challenges, and motivations for implementing RPA with process mining in digital projects compared to individual implementations?

24. What is the data extraction challenges for Process mining?
25. What are the challenges faced when implementing an RPA project?
26. What is the benefit of RPA implementation in your business?
27. What are the benefits of Process mining implementation in your business?
28. What are the benefits of having combined implementation between the two solutions?
29. How complex it is to have a combined implementation?

(4) What are the critical success factors for implementation of RPA with process mining in digital projects?

Critical success factors

30. What are the key factors using to derive business values?
31. What are the key elements that constitutes a benefit for implementing digital projects?
32. What is the process of approving business case in your organisation?
33. What are the key differentiating elements for RPA projects?
34. What are the key motivators for implementing RPA projects?
35. Does the cost of the software have an impact in selecting the use cases?

(5) How to develop a road map for successful implementation of RPA with Process mining in digital projects?

36. How do you define best practices and standards for implementing RPA and Process mining projects?
37. What are the lessons learned from the RPA and Process mining implementation?
38. Why is it important for your organisation to have standards defined?
39. How do you plan to maintain the best practice and standards defined?

APPENDIX B - Participant Information Sheet (PIS)

Dear Sir / Madam

My name is Semakaleng Maherry, I am a Master's student in Digital Business at Wits Business School. I am conducting a research study about combined implementation of RPA and Process mining under the supervision of Dr Michael Sony.

The study title is **The role of robotic process automation in process mining for digital projects**

Participation details are as follows:

- Format: One on one interview
- Duration: estimated to last for 25 minutes
- Location: Virtually (MS Teams and/or Zoom), at a time convenient for you

With your permission, I would like to record the interview via MS Teams and/or Zoom. The data will be saved on my laptop for roughly one year before being destroyed. The data will be accessible only to the researcher and supervisor.

The interview will be kept confidential and anonymous. When I share the findings of the research study, I will not include your name or any other information that may be used to identify you. Other researchers may utilise the data collected in this research project with your approval, but your name and any personal information will not be used or passed on.

If you decide to take part in the research study, it should be because you want to volunteer. You can stop being in the study at any time. You do not have to answer any questions if you do not want to. You will not get any direct benefits if you choose to join the research study. You will not lose any services, benefits or rights you would normally have if you decide not to join. Taking part in the research study will not cost you anything. You will not be paid for being in this research study.

The risks for this research study are no more than what happens in everyday life / some of the questions asked may make you feel sad or upset. If this happens, I will stop the interview and continue another time.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408,
email hrecnon-medical@wits.ac.za

Researcher:
Semakaleng Maherry
Email: 2014625@students.wits.ac.za
084 729 1950
Supervisor:
Dr Michael Sony, PhD
Email: michael.sony@wits.ac.za
011 717 3817

APPENDIX C – Consent Form

The role of Robotic Process Automation in mining data for digital projects
Semakaleng Maherry

I, ……..., agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below)

The research study was explained to me. I understand what this study is about.	YES	NO
I understand that I can volunteer to take part in the study	YES	NO
I agree that the interview will be recorded	YES	NO
I agree that direct quotations from my interview may be used by the researcher in their research report	YES	NO
I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report	YES	NO
I agree that other researchers may use the information I provide in my interview (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on	YES	NO

Participant

Signature ----------
Name of participant ----------
Date ----------

Researcher

Signature ----------
Name of researcher ----------
Date ----------

APPENDIX D – CODES USED IN ANSWERING RESEARCH QUESTION 1

1. Complexity	2. Integration	3. Unstructured Data
4. Data Quantity	5. Data Access	6. Testing
7. Data Quality	8. Understanding Project Scope	9. Strategic Planning
10. Data Granularity	11. Attended vs. Unattended Bots	12. Decision-Making
13. Organisational Challenges	14. Time-Saving Efficiency	15. Downsizing Manual Efforts
16. Potential Replacement of Human Activities	17. Optimising High-Value Human Resources	18. Transparency in Business Processes
19. Data-Driven Insights	20. Objective Views	21. Continuous Improvement
22. Measurement	23. Discovery	24. Correct Use Case
25. Monitoring post-implementation	26. Correct Use Case	27. Monitoring Capability
28. Constant Changes	29. Project Discovery	30. Integration potential
31. Leveraging Business Value	32. Task Mining as a Simplification Tool	33. Technological Complexity
34. Separate Processes	35. Different Technologies	36. Database Structure Understanding
37. Recording	38. Data management	39. Efficiency
40. Data Analysis	41. Data Aggregation	42. Merging Events

APPENDIX E – CODES USED IN ANSWERING RESEARCH QUESTION 2

1. Business insight	2. Context variability	3. Business strategy
4. Organisational size	5. Business value	6. Experience
7. Legacy systems	8. Business value	9. Clunky
10. Colleague experience	11. Use case	12. People
13. Sponsorship	14. Success factors	15. Methodology
16. Simplification	17. Automation	18. Efficiency
19. Business case	20. Cost-benefit analysis	21. Outcome
22. Proof of value	23. Stakeholder involvement	24. Confidence
25. Customer initiated	26. Request for proposal	27. Automation
28. Technology	29. Strategic automation planning	30. Pre automation analysis
31. Unique distinguishing characteristics	32. Technology Comparison	33. Operational excellence
34. Standardisation	35. Efficiency	36. Work automation
37. Value creation	38. Understanding	39. Change management
40. User-friendly implementation	41. Technical accessibility for end users	42. Conformity
43. Bottlenecks	44. Contextual insight	45. Strategic adoption
46. Maximised value	47. Flexibility	48. Ease of use