A Design Science Approach to Predicting RPA Implementation Outcomes in SME Freight Forwarding

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I. Acknowledgements

This thesis represents more than the completion of an academic requirement. It is the result of a long and often difficult personal journey, marked by both perseverance and transition. Over the course of this project, I was faced with one of life's greatest challenges: the passing of my father. In the midst of grief, I stepped into his role, taking over the family business and assuming responsibilities I could never have anticipated when this academic path first began. Balancing the demands of being a company owner with the complexities of academic research tested me in ways that extended far beyond intellectual effort. It required focus in moments of exhaustion and trust in moments of uncertainty.

Throughout this period, I was fortunate to be supported by people whose presence made all the difference. I would first like to thank my supervisor, J.P.S. Piest. His guidance, thoughtful critique, and clear direction were indispensable to the development of this work. More than that, I am grateful for his patience and understanding. He supported me not only as a student but as a person navigating significant life circumstances. I also wish to thank M. de Visser and study advisor C. Röring for their flexibility and support on behalf of the MSc program, which allowed me to complete this thesis under exceptional personal conditions.

To my family, your support has carried me through. To my mother, thank you for always encouraging me to rise to the version of myself you believe in. Your strength has been a constant source of motivation. To her partner, thank you for being a generous and dependable sparring partner, always ready with grounded advice. To my partner, your unwavering patience and belief in me has been one of the most enduring sources of support in this journey.

Lastly, and above all, I dedicate this thesis to my father. He always put me first. The values he instilled in me responsibility, resilience, and care. have shaped every step of this process. His absence is deeply felt, but his presence continues to guide me.

II. Abstract

This thesis presents the development and evaluation of a predictive model to assess the feasibility and expected outcomes of Robotic Process Automation (RPA) implementations in small and medium-sized freight forwarding companies. Using a design science research approach, the model was iteratively constructed through a systematic literature review, expert interviews, and a case study. The revised model captures key dimensions such as process efficiency, cost reduction, error minimization, and organizational readiness. Its applicability was validated through the implementation of an RPA solution in a micro-sized freight forwarder, where a manual invoicing process was automated. The case demonstrated substantial efficiency gains, including a 72 percent reduction in weekly process time and over 99 percent reduction in time per invoice, at a fraction of the cost of manual labour. The findings confirm that even resource-constrained logistics SMEs can achieve measurable returns from lightweight RPA projects. The model serves both as a design guide and a tool for ex-ante and ex-post evaluation, contributing to theory on automation feasibility and offering practical value to decision-makers in similar organizational settings.

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VI. List of Abbreviations

BPM	Business Process Management
L&SCM	Logistics and supply chain management domain
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RPA	Robotic Process Automation
SMEs	Small- to Medium-sized Enterprises
SLR	Systematic literature review

1. Introduction

This chapter establishes the context and introduces the research design. Section 1.1 outlines the role and characteristics of freight forwarders as the focal organizational context. Section 1.2 defines Robotic Process Automation (RPA) and explores its relevance within logistics operations. Section 1.3 elaborates on the key characteristics of RPA and the considerations for its application in Small- to Medium-sized Enterprises (SMEs). Section 1.4 presents the research design, including the main and sub-research questions and methodological orientation. Finally, Section 1.5 provides an overview of the structure of the thesis.

1.1 Freight Forwarders

Freight forwarders have long played an important role in commerce and the international carriage of goods. Traditionally, the freight forwarder has been the link between the owner of the goods and the carrier and provided forwarding or clearing services. The forwarder acted as the agent for the owner of the cargo or the carrier (Saeed, 2013). Many enterprises outsource transportation tasks by entrusting independent freight forwarding companies with their transportation activities. The forwarding company is allowed to choose the mode of fulfilment; that is, it can use its own vehicles to execute the corresponding entrusted tasks (self-fulfilment), or an external freight carrier (subcontractor) receives a fee for the request fulfilment (subcontracting). The subcontractor receives independent shipment contracts of different types and specifications for completion. According to (Chu, 2005) there are two incentives for involving a subcontractor. Firstly, when the total demand is greater than the overall capacity of owned trucks, logistics managers may consider using outside carriers. Secondly, integrating the choice of fulfilment mode into transportation planning may bring significant cost savings to the company because better solutions can be generated in an extended decision space. This extended problem is known as integrated operational freight carrier planning. In Figure 1 an overview is given of the logistics actors.

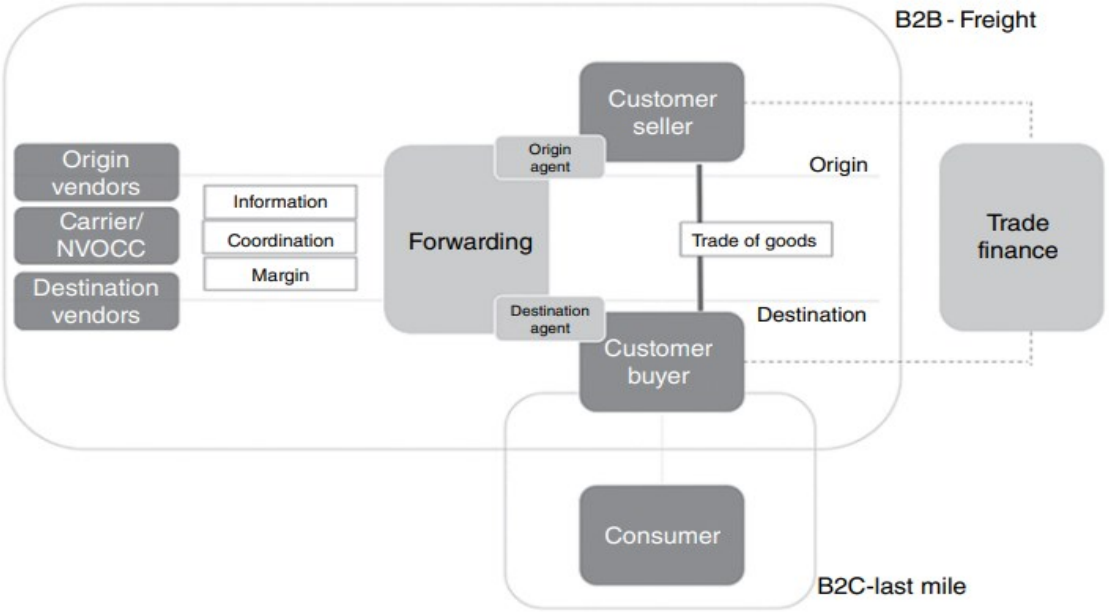


Figure 1 shipment parties (Huber, 2021), original source OceanX

A freight forwarding company's profit is the difference between the price that the customer is obliged to pay for the request execution and the costs of request fulfilment. These costs result either from fulfilment by the company's own transportation capacity or from the external processing of orders as a consequence of involving a subcontractor (Krajewska & Kopfer, 2006). A McKinsey study that analysed the impact on jobs due to advances in robotics, artificial intelligence (AI), and machine learning came to the chilling conclusion that transportation and warehousing are among the sectors with the highest potential for automation (Manyika et al., 2017). While many of these processes have proved effective, they are lacking efficiency. Considering that a substantial portion of information is repeatedly exchanged among various stakeholders, it is generally accepted that paper-based processes tend to be less efficient compared to their digital counterparts (Huber 2021).

Digitalization in the context of logistics means how whole domains are restructured around digital communication and media infrastructures transmitting information digitally (Brennen & Kreiss, 2014). Many tasks of white-collar employees in international transportation relate to communication of information: creating it, receiving it, capturing it, manipulating it, forwarding it, and taking action based on it (Manyika et al. 2017).

1.2 Robotic Process Automation

According to the Institute for RPA, "RPA is the application of technology that allows employees in a company to configure computer software or a 'robot' to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems" (Institute for Robotic Process Automation 2020). Research into the application of RPA shows that this technology is enabling automation in areas that had in the past shown too expensive to do so (Brandon-Jones et al., 2014).To address the subject of RPA, an explanation of what the technology is and how it fits into the context of an international logistics company is initially needed. A logistics company typically has large departments of clerks who are creating documents like bills of lading or invoices. These documents are often created by directly copying parsed information from documents received from clients and pasted into new templates. By mimicking the actions of these clerks, it is feasible that a properly trained automated technology could take over this task. Specifically, an RPA bot works in the presentation layer of a system and acts like a human using the same inputs that a mouse and keyboard would by clicking and typing (Fersht & Slaby, 2012). In General RPA is used for simple task automation, while the more complex tasks which require interpretation are done by human experts (Pramod, 2022). In the work of Agostinelli (2019) it is argued that the need for a shift of RPA for creating software robots that are intelligent and flexible in handling dynamic and knowledge-intensive situations. Rutschi and Dibbern (2020) introduced a framework for providing guidelines to build software robots for transforming human executed routine into an automated routine through the guidelines. However, RPA does not have a strong theoretical foundation. Nonetheless, some of the recent studies tried to explore this area. Syed et al. (2020) give a systematic review in their study and a structured literature review was carried out by Hofmann et al. (2020) with specific reference to tool analysis. In a study by Wanner et al.(2019) an automatable indicator system was established with the help of a robot for the virtual workforce and process mining techniques. Jiménez-Ramírez et al, (2020) proposed a testing environment and test suit using RPA which leverages UI log for interface actions. Action logger is a tool proposed for UI recording and generates output that can be further fed to process mining. The tool offers logging that suits RPA, data awareness and context independence (Leno et al., 2019). Agostinelli et al. (2019) proposed a classification framework RPA based on some key dimensions. RPA algorithm requires efforts in identification, elicitation and programming of the tasks to be automated. Algorithmic RPA rule deduction is carried out by capturing user behaviour to take out the RPA benefits (Gao et al. 2019). Robotics has a great role in the RPA for industry, industrial revolution and several organisations of the kingdom of Saudi Arabia have taken

efforts to adopt automation to have a sustainable advantage over its competitors (Aldossari and Zin, 2019). In summary and context of freight forwarding, RPA covers several recurring administrative and operational tasks that present clear opportunities for automation. Examples include the processing and matching of transport-related invoices, updating shipment tracking statuses across platforms, verifying booking confirmations, and extracting data from customer emails or PDF documents for entry into Transport Management Systems (TMS). These tasks are typically rule-based, high-volume, and prone to manual error, making them highly suitable candidates for automation.

1.3 RPA Characteristics

For proper identification of an RPA task, there are still a few more steps required to identify whether it is the right candidate for RPA. Traditional process automation in the context of Business Process Management (BPM), where systems are configured to interact with each other, requires many of the same cases of a task to be done in a short period to justify the costly investment. RPA, on the other hand, offers a cheaper and quicker implementation to target tasks that do have repetition, but a small amount of variation spread out over a longer time but still have enough scale to consider automation (van der Aalst et al. 2018). Insurance and credit card companies have utilized RPA as they had a large pool of claims and payments that were often being handled in very similar ways. Jesuthasan and Boudreau (2018) explain that there are three characteristics to categorize the components of jobs to identify if they are suitable for automation. The first is whether a task is repetitive or variable. The second characteristic is whether a task is independent or interactive. The third characteristic of a task ready for automation is whether it is physical or mental work. Taken together, these criteria suggest that a task is suitable for automation when it is predominantly repetitive, mentally driven, and can be executed independently without frequent human interaction.

While the initial capital expenditure in having the bot created by one of the 20+ RPA companies is continuing to drop, the Return On Investment (ROI) for that investment is still unclear for SMEs who do not have the scale to take advantage of automating these rote and repetitive tasks (Sullivan et al., 2021). Companies need to carefully identify certain processes that have a rule-based structure and are draining a considerable amount of resources (Lowes et al., 2017). Variability in the types of processes that logistics companies could automate and the 12–15 players included in almost every international shipment make it very difficult to map out how many of the tasks need to be accomplished. System errors, changes in forms, variability in documentation types, etc. all create the need for RPA tools to have the ability to “learn” like a human would. However, the tools are not developed to that level yet (van der Aalst et al. 2018). Since then, AI integration has advanced RPA capabilities significantly. For example, the incorporation of machine learning into a case study has enabled adaptive learning, real-time anomaly detection, and predictive analytics, allowing systems to adjust to dynamic conditions and reduce error rates (Pandy et al., 2024). Automation not only can help processes to run more smoothly but also enables companies to monitor processes over time in hopes of that continuous improvement goal that many large logistics companies so proudly advertise. What may not be abundantly clear is that the “monitoring” of tasks in terms of an RPA bot has a cost associated with it, as you have to have trained staff or outside consultants available to keep an eye on the tool whether it is still doing what it is supposed to do.

The main problem that will be addressed in this thesis is the lack of a structured, evidence-based framework that enables small- and medium-sized freight forwarding companies to assess the feasibility and anticipated outcomes of Robotic Process RPA implementations. The model is intended to support organizations at the stage where candidate processes for RPA have already been identified, enabling structured evaluation of their feasibility, benefits, and implementation challenges before committing to full-scale adoption. While RPA has been widely acknowledged for its potential to

enhance operational efficiency, reduce costs, and minimize human error (Santos et al., 2020 Costa et al, 2022; Pramod, 2022), existing models are predominantly conceptual in nature and often designed for application within large enterprises with extensive technological and financial capabilities (Syed et al., 2020; Hofmann et al., 2020). These models typically fail to address the context-specific constraints faced by SMEs, including integration challenges with legacy systems, compliance with evolving regulatory requirements, and resistance to organizational change (Sullivan et al., 2021; van der Aalst et al., 2018). Consequently, SME freight forwarders lack the analytical tools necessary to make informed, project-level decisions regarding RPA adoption and implementation.

1.4 Research design

This thesis will focus on identifying opportunities for RPA solutions within SMEs. Based on the context description and problem statement, the following main research questions is defined:

How can a design science research approach be applied to develop and validate a model for predicting the feasibility and benefits of RPA implementation in SME freight forwarders?

This research will follow a design science approach which is proposed by Vaishnavi and Keuchler (2015). And further build upon it with the methodology as used by Herm et al. (2022). The inductive theory building approach of Durach et al. (2021) is utilized to develop the RPA outcome and benefit prediction model. This approach combines theorizing with empirical research. More specifically, a literature review is conducted regarding RPA based on the method of Durach et al.(2021) to develop the RPA outcome and benefit prediction model. Next, expert opinion interviews are conducted to verify and refine the RPA outcome and benefit prediction model. Following, case study research is conducted at a SME to use and evaluate the RPA outcome and benefit prediction model in an operational context.

To address the main research question, the study is guided by seven sub-research questions that align with the design science methodology and its iterative structure. (1) *What insights does existing literature provide on predicting the benefits and feasibility of RPA implementation?* and (2) *Which theoretical and practical factors should be included in a predictive model for assessing RPA feasibility and outcomes?* are addressed through a systematic literature review aimed at establishing a theoretical foundation for model development. The second phase of the research involves expert interviews to evaluate and refine the initial model. In this context, (3) *How do expert perspectives align with or challenge the model derived from literature?* and (4) *What adjustments are necessary to improve the model's applicability in the SME freight forwarding context?* guide the empirical investigation of practitioner insights. The third iteration consists of a case study designed to evaluate the model in a real-world setting. Here, (5) *How effectively does the model predict the outcomes of RPA implementation in a real-world SME case?* and (6) *Which business processes within the SME case are most suitable for RPA?* is used to assess the model's practical performance. Finally, the broader implications of the research are explored through (7) *What limitations and contextual challenges affect the feasibility and scalability of RPA in SME logistics firms?* Which is informed by findings across all three research phases. How well did the model predict the outcomes?

Answering the above mentioned questions will provide a better understanding of how RPA initiatives can be systematically assessed in terms of feasibility and expected outcomes within small- and medium-sized freight forwarding companies. From a theoretical perspective, the study contributes to the growing body of literature on RPA by offering a structured, empirically informed model that integrates insights from both academic research and industry practice. It addresses a gap by extending automation research into the underexplored SME logistics domain, where existing frameworks are often not directly applicable. In doing so, this study specifically focuses on the application of RPA within SME freight forwarders, a sector that has received limited attention compared to larger enterprises. By proposing an outcome benefit prediction model tailored to SMEs, the research contributes a structured approach to evaluating automation feasibility and benefits prior to implementation. From a practical standpoint, the predictive model developed in this study provides decision-makers in SME freight forwarders with a tool to evaluate potential RPA projects before implementation, thereby reducing uncertainty, improving investment decisions, and supporting strategic alignment of automation efforts with organizational needs.

1.5 Structure

The remainder of this thesis is structured as follows. Chapter 2 outlines the research methodology, including the design science approach, the structure of the three iterative research cycles, and the specific methods employed for data collection and analysis. Chapter 3 presents the first iteration of the design process, consisting of a systematic literature review to identify relevant theoretical constructs, success factors, and evaluation criteria for RPA feasibility and outcome prediction. Chapter 4 discusses the second iteration, which involves expert interviews aimed at validating and refining the initial model by integrating practitioner insights and identifying sector-specific implementation challenges. In chapter 5 the revised model is applied and evaluated within a real-world case study of an SME freight forwarder. Chapter 6 concludes the thesis by summarizing the key findings, discussing their theoretical and practical implications, addressing the study's limitations, and offering directions for future research.

2. Methodology

This chapter outlines the methodological approach used to develop and validate the predictive framework for RPA implementation in SME freight forwarding. Section 2.1 presents the overarching research design, based on a design science research methodology. Section 2.2 details the literature review process, including the use of PRISMA guidelines and the contextualized explanation approach. This relates directly back to sub research question 1 and 2 by establishing a theoretical foundation for prediction RPA outcomes. Section 2.3 describes the expert interview study and its role in further developing the framework. With This sub questions 3 and 4 are covered by empirically evaluating and refining the model. Section 2.4 discusses the case study methodology, including the rationale for single-case selection and triangulation strategies. By doing so questions 5 and 6 will be answered by testing the model's predictive validity in a real-world SME logistics context. Section 2.5 concludes the chapter with a summary of the methodological contributions and rationale.

2.1 Overview

This research adopts a design science research (DSR) approach as its methodological framework. The foundation for this approach is the model proposed by Vaishnavi and Kuechler (2015), which outlines five key phases: (1) Awareness of the problem, (2) Suggestion and data collection, (3) Development, and (4) Evaluation and (5) conclusion. To ensure relevance to the context of RPA, this study builds specifically on the DSR adaptation presented by Herm et al. (2022). Their framework was designed for guiding RPA implementation projects. This offers a tailored application of Vaishnavi and Kuechler's (2015) original DSR framework. It explicitly integrates iterative refinement cycles and provides structured guidance for combining theoretical development with empirical validation in automation contexts.

The Herm et al. (2022) methodology was selected because it incorporates domain-specific considerations for RPA projects, making it suited to the objectives of this study. Additionally, elements of interpretive theory building are employed, drawing on the grounded theory methodology of Strauss and Corbin (1998) to support the empirical development and refinement of the predictive model across iterations. This integration of methodological perspectives enables both theoretical sensitivity and practical relevance. research will follow a design science approach which is proposed by Vaishnavi and Keuchler (2015).

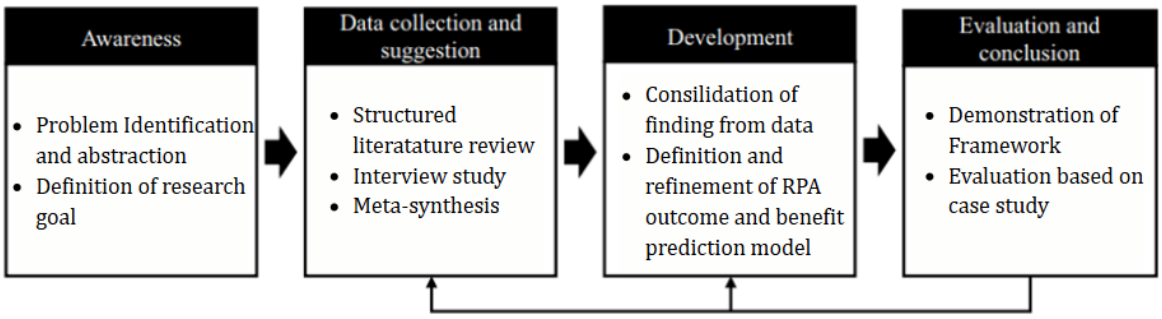


Figure 2 Methodology based on Herm et al. (2022)

The design cycle with an explicit step of data collection and have merged the last two steps. See Figure 2 for a summary. All phases are sequential but have been iterated until a consolidated framework

emerged. Specifically, we have performed three design iterations of data collection and suggestion, development, and evaluation and conclusion:

• Iteration 1: Structured literature review to enhance theoretical sensitivity, meta synthesis, initial framework.

• Iteration 2: Expert interview study, consolidated framework, demonstration, and expert feedback.

• Evaluation: Case Study and Framework Evaluation.

The initial Awareness phase of this research was shaped by the challenges outlined by Syed et al. (2020), particularly the need for a structured framework to support the systematic design, implementation, and evolution of RPA within organizations. A key issue identified in the existing literature is the lack of concrete, project-level guidance for RPA adoption. While prior studies, such as those by Gotthardt et al. (2019), acknowledge broad challenges associated with RPA implementation, these discussions remain largely conceptual and do not provide actionable insights at the project level. Similarly, Syed et al. (2020) emphasize overarching concerns but do not offer detailed frameworks for practical application. Additionally, Jiménez-Ramírez et al (2020) focus primarily on process flow identification, aligning more closely with task mining methodologies rather than providing comprehensive guidance for end-to-end RPA project execution.

To establish a foundational understanding of the field and make an initial contribution, a systematic literature review was conducted, adhering to the methodology proposed by Durach et al.(2021). The insights from the literature review will then be used for the development of the first iteration of the RPA framework. Subsequently, to refine and validate this initial model, semi-structured interviews were conducted, enabling an empirical assessment of the framework's relevance and applicability.

The integration of insights from both the structured literature review and the expert interview study serves as the foundation for developing a comprehensive RPA framework. The initial version of this framework will be constructed based on insights derived from the literature, which will then be refined and expanded through expert interviews. Any steps in the RPA implementation process identified in the literature that are deemed inapplicable or irrelevant in practical settings by the experts will be excluded. Conversely, steps that emerge as significant during the expert discussions will be incorporated to enhance the framework's applicability. leading to the final version of the framework, which will constitute a key contribution of this research.

The evaluation of the framework will be guided by the FEDS Framework (Venable et al., 2016) to assess its utility, quality, and efficacy, as outlined by Hevner et al. (2004, p. 83). Given the early stage of this research and the current lack of general recommendations for RPA implementation, a two-stage naturalistic and summative evaluation will be conducted, following a human risk and effectiveness strategy (Venable et al., 2016). In the first stage, the framework will be introduced to the interviewed experts to gather their feedback. In the second stage, the revised and refined version of the framework will be assessed utilizing a real-life case.

2.2 Literature review methodology

This section outlines the structured literature review methodology applied to address sub question 1 and 2, which explore what is already known about predicting RPA benefits and which theoretical and practical factors should be included in a predictive model. The review follows the contextualized synthesis approach proposed by Durach et al. (2021), adapted to the logistics and SME context of this research. Their main goal is to " help researchers who need to synthesize literature but are uncertain which approach is best. Our examples are mainly L&SCM-specific, but with a level of generality to also

serve related disciplines."(p.1091). They describe four possible functions of the literature review, namely; Inductive Theory building. contextualized explanations, theory testing and interpretive sensemaking. The contextualized literature review is described as a method which helps to create or improve our knowledge of "for whom,"" in what circumstances," and "when '' certain phenomena can be observed (Whetten, 1989). A deeper understanding of such causal mechanisms requires an iterative approach involving both inductive and deductive reasoning. The motivation for contextualized literature reviews arises from prior and mostly case study-based literature (Welch et al., 2011). This literature rejects causal homogeneity, or the idea that mechanisms exist that lead to causation in the same way in all circumstances. In this sense, it is similar to the abductive research approach, which is concerned with the particularities of specific situations. Many L&SCM studies reject "one-size-fits-all" solutions to designing and managing supply chains (see, e.g. Claycomb & Frankwick, 2004;Parker et al., 2008; Brandon-Jones et al., 2014). From here the following steps follow:

The researchers begin by formulating a theory and the principle causal mechanisms that might account for the hypothesized relations. We follow Hall (2006) and call this the "principal theory." However, the researchers should also adduce one (or more) alternative explanations to account for study outcomes that weaken or even reject the principal theory. The next step of Theorization through literature reviews is to develop a stringent assessment of the validity of the principal theory (Miller and Tsang, 2011). Therefore, the researchers need to read the literature closely, and sometimes even get in touch with the authors themselves. to understand the mechanisms that should occur if the principal theory is valid. The challenge is to also consider the descriptive power of other explanations not offered by the principal theory. Notes should be taken on "the sequence of those events, the specific actions taken by various types of actors, [. . .] as well as other observations designed to establish whether the causal chain that [the principal] theory anticipates is present" (Hall, 2006, p. 28). This is more than the mere search for "moderating variables," as this type of review seeks to explore whether the mechanisms observed in the studies are consistent with, or could refine, the mechanism proposed in the principal theory. The researchers should then reach a conclusion regarding the activating mechanisms of the principal theory, and carefully construct a causal chain of evidence from the sample studies. Figure 3 illustrates the iterative relationship between theory and empirical findings, combining both deductive and inductive reasoning to develop a context-sensitive understanding of causal mechanisms. This process reflects the methodological foundation of the research, where theoretical insights from literature are used to construct an initial model, which is then developed further through expert interviews and evaluated in a real-world case study.

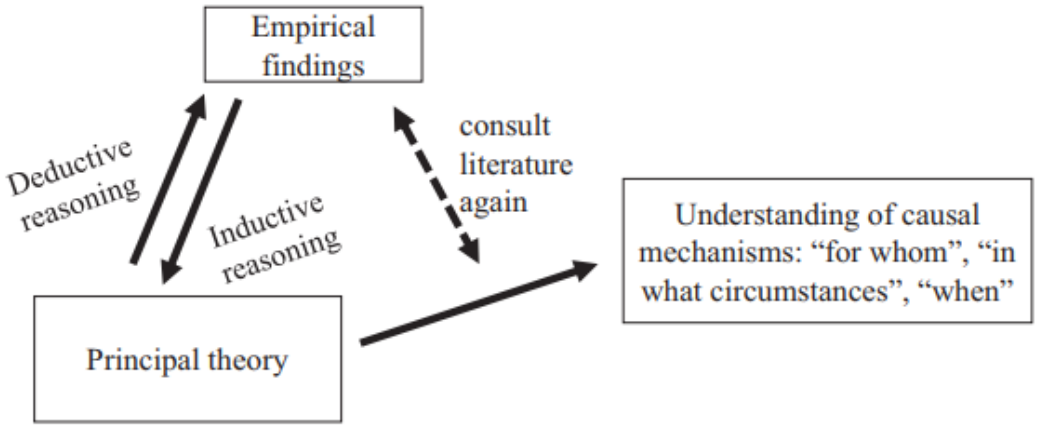


Figure 3 Synthesized literature review as contextualized explanations as shown in Durach et al. (2021)

To achieve the above mentioned goals the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al. 2021) method will be applied. PRISMA primarily focuses on the reporting of reviews evaluating the effects of interventions, but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions (e.g. evaluating aetiology, prevalence, diagnosis or prognosis)" for the literature review as its designed intent matches with the goals of the literature review.

Applying PRISMA yields the following steps for the literature review: As stated in the work of Welch et al. (2011) the L&SCM literature reviews are predominantly based on prior and case study based research. This paper will follow those lines and also utilise relevant case based research as eligible study designs.

The search started with a book chapter as a seed point (Sullivan et al. 2021). Citations from this were used to identify further sources of interest. Building on this the search strategy emerged around several main aspects: "RPA", "Project success" , "Outcome prediction", "Freight Forwarding" and "SME logistics". Searches were carried out in Q1 2025. The Strategy is applied to multiple bibliographic databases data bases namely, ScienceDirect, Ebscohost and google scholar. These sources are chosen to gather information from peer reviewed publications. Additionally, synonymous and automated term suggestions were also used. Where possible the time constriction was applied for papers published from 2005, this is done to keep working with the most recent publications. From here citations are used to identify more relevant studies. Solely studies published in the English language were considered. In the case of general issues, like platform difficulties as described in the work of MacFarlane et al. (2022). Specific ad hoc searches were used to find literature. To assess the relevance of the found literature emphasis was put on the identification and implementation of RPA projects. With this multifaceted strategy the current state of publications within this domain was mapped out.

2.3 Expert Interviews Methodology

This section describes the methodology for the expert interview study, which responds to sub questions 3 and 4. These questions investigate how practitioner perspectives align with or challenge the initial model derived from literature, and what adjustments are necessary to improve its applicability in SME freight forwarding settings. The interviews provided empirical insights which will be used for the second iteration of the model.

Potential Interview candidates were selected based on a convenience sampling basis. The sample consists of five experts with different backgrounds in terms of roles, industries, and company sizes agreed to share their experiences in an interview. The term expert is defined as someone who possesses special knowledge that can only be attained under special circumstances, that is in our case someone who has participated in at least one real-life RPA project. Since these experts were from Dutch-speaking countries, the interview study was conducted in Dutch and the concepts were later translated into English language. We opted for Physical interviews to enable synchronous communication. We followed a semi-structured interview guideline with three parts: (A) background information and skills, (B) alignment between theory and practice as well as (C) discussion of the identified preliminary stages. To align theory and practice, general questions were asked in section (B) about the how and why of their RPA project. As an example, this allowed us to distinguish theoretical and practical aspects when developing a proof of concept. Following that, in (C), we demonstrated the preliminary framework derived from literature. Here, the experts critically discussed the usefulness, sequence, and completeness of stages and framework as well as provide recommendation for changes. The questions could be answered openly to include emerging ideas. The interviews have been recorded, transcribed, and the data has been coded and analysed based on the grounded theory approach by Strauss and Corbin (1998). While (A) and (B) were conducted without any preconceived ideas, (C) was based on a review of the substantive literature to enhance theoretical sensitivity (Thistoll et al. 2016).

2.4 Case study methodology

This section explains the design and rationale for the single critical case study, which addresses sub questions 5 and 6. These questions evaluate how effectively the model predicts RPA outcomes in a real-world SME context and which processes are most suitable for automation. The case study represents the evaluation of the design science cycle and tests the model's operational relevance. For this research, a single critical case study design is adopted, as defined by Farquhar (2012). This approach is particularly suitable when existing theory is sufficiently developed to enable the case to test, support, challenge, or extend specific theoretical propositions. As Farquhar notes, "Where theory has specified a clear set of propositions which the case can then test to support, challenge or extend the theory. Clearly, the theory has to be very strongly developed for this type of investigation. To achieve information about that permits logical deductions of the type 'If this is (not) valid for this case, then it applies to all (no) cases" (p. 40). This logic of analytical generalization is relevant to the present study, as the goal is not statistical generalizability, but rather the development and testing of a theory-informed framework in a context where RPA adoption is both promising and underexplored. By selecting a single, information-rich case that aligns closely with the theoretical domain, the research aims to generate insights that are transferable to similar cases.

The main advantages are the emerging insights and depths provided from the single costs, however this comes at the cost of the potential credibility of the case within the research context. Additionally, The principle in case study research is getting a fix on the phenomenon or, as it is referred to in the extract above, 'the unknown position' from two or more other points. This fix can be achieved through using the different methods and informants or even theory triangulation (Denzin 1978). In this study several triangulation methods will be used namely; Theoretical triangulation, where more than one theoretical perspective will be used to interpret the single data set. Methodological triangulation, where it will consist of both a survey and analysis of workflows. While referred to as a survey, this phase primarily involved informal conversations with employees aimed at identifying automation opportunities and discussing workflow inefficiencies. These conversations were not systematically recorded or analysed, and thus do not constitute formal qualitative data. However, they served as a practical, low-impact mechanism to surface candidate processes for automation based on operational

pain points observed by staff. This approach is consistent with early-stage problem identification in design science research, where the researcher must develop an understanding of both the nature of the problem and the importance of addressing it. As Peffers et al. (2007) state, this understanding forms a foundation for artifact development and may be supported by the researcher's contextual awareness and practitioner input. Additionally it is stated that problem identification is only the first step. It must be followed by the translation of real-world needs into performance objectives for an artifact. In this study, the identified process inefficiencies were used to derive the core functional requirements for the RPA solution. To support the practical relevance of the case selection, the process chosen for automation was evaluated against commonly accepted RPA suitability criteria, including rule-based logic, high volume, repetitive execution, and low exception handling requirements (Aguirre and Rodriguez, 2017). These heuristics are particularly applicable to SME contexts, where automation opportunities are often identified through qualitative judgment rather than large-scale process mining or quantitative screening.

2.5 Summary

This chapter has outlined the methodological foundation of the research, which follows a design science research approach based on the model proposed by Vaishnavi and Kuechler (2015). To ensure alignment with the specific context of Robotic Process Automation (RPA), this study adopts the adapted framework developed by Herm et al. (2022), which integrates iterative model development and empirical validation tailored to RPA implementation projects. The research consists of three iterations: a systematic literature review, expert interviews, and a single-case study.

The first iteration involved a systematic literature review, conducted according to the PRISMA guidelines (Page et al., 2021) to ensure methodological transparency and replicability. To guide the analysis and synthesis of findings, the approach by Durach et al. (2021) was applied, using contextualized explanations and a combination of inductive and deductive reasoning to identify relevant causal mechanisms and theoretical constructs for the initial model.

The second iteration involved semi-structured expert interviews to assess the applicability of the literature-based model in practice and to identify necessary adjustments. The interviews were analysed using grounded theory principles to support theory building through empirical insight. The finally an evaluation consisting of a single critical case study, selected according to the logic outlined by Farquhar (2012), which allows for the analytical testing of theoretical propositions. Triangulation methods, both theoretical and methodological, were applied to enhance the validity of the findings.

Together, these methodological steps form the basis for developing and validating a predictive framework for assessing the benefits and expected outcomes of RPA implementations in SME freight forwarding, while contributing to both academic knowledge and practical application.

3. Iteration 1: Systematic Literature Review

This chapter presents the first iteration of the research, which involves a systematic literature review aimed at establishing the theoretical foundation for the predictive framework. Section 3.1 outlines the state of theory and introduces the sub-research questions guiding the review. Section 3.2 through Section 3.7 provide a structured discussion of key benefit dimensions identified in the literature, including operational efficiency, cost savings, productivity, risk management, ease of use, and security. Section 3.8 summarizes the key findings. Finally, Section 3.9 presents the initial version of the RPA Outcome and Benefit Prediction Model, synthesizing the theoretical insights into a conceptual structure for further empirical testing.

3.1 State of theory

To structure this literature-based iteration, the following sub-research questions guide the analysis: (1) What insights does existing literature provide on predicting the benefits and feasibility of RPA implementation? And (2) Which theoretical and practical factors should be included in a predictive model for assessing RPA feasibility and outcomes? These questions are addressed through a systematic review with the aim of synthesizing core outcome dimensions. Following the PRISMA guidelines, as described in Section 2.2, the SLR was conducted. The PRISMA Item Checklist is included in Appendix A and the PRISMA Flowchart in Appendix B. Table 1 presents the literature review results. Each advantage will be discussed in a separate Section. An additional literature review can be found in Appendix B which was retrieved from the work of Plattfaut and Borghoff (2022).

Results Literature Review	Advantages of RPA					
Reference	Operational Efficiency & Automation	Cost Savings & Resource Efficiency	Enhanced Productivity & Creativity	Risk Management & Compliance	Ease of Use & Implementation	Security & Enterprise-Safe
Ansari et al. (2019)	X	X	X	X	X	X
Brzeziński (2022)	X	X	X			
Costa et al., (2022)	X	X	X			
Flechsig et al. (2022)	X	X	X			
Penttinen et al. (2018)	X	X	X			
Plattfaut and Borghoff (2022)	X	X	X			
Pramod (2022)	X	X	X			
Radke et al. (2020)	X	X	X			
Santos et al. (2020)	X	X	X			
Syed et al. (2020)	X	X	X	X	X	X

Table 1 Literature Review Results

RPA has emerged as a transformative technology for businesses seeking to streamline operations and enhance efficiency. The adoption of RPA solutions has proliferated in various industries, and researchers have examined the advantages it offers. However, in terms of the quantifiable advantages of RPA, the literature remains vague. The quantifiable advantages identified fall mostly under the facet of increased productivity. Concerning the financial aspects of RPA, the authors argue that RPA is cheaper than humans or that RPA is able to create cost-effective processes, resulting in operational/resource efficiency and cost savings (Penttinen et al. 2018). Others argue that by automating routine tasks, RPA is able to maximize automation effects and reduce costs of auditing processes (Cho et al., 2021; Mendling et al., 2018). The identified quantifications are mainly derived from specific case studies, varying from cost savings of 30–80 percent, to ROIs between 650 percent and 800 percent (Lacity & Willcocks 2016; Polak et al. 2020; Schmitz et al., 2019). In other publications, RPA is quantified in terms of FTEs, with the authors arguing that one bot is able to do the work of two to five human FTEs (Lacity et al. 2016). The associated financial advantages of RPA provide

organizations with an alternative to traditional business process outsourcing (Gami et al., 2019). Organizations are able to bring their outsourced processes back in-house as RPA mitigates the cost pressure at the same level as business process offshoring (Lacity et al. 2016), resulting in significant business cases demonstrating explicit financial benefits. In addition to productivity and cost-related advantages, the literature identifies several other benefits of RPA. One such benefit is risk management, where automation reduces the likelihood of human error and enhances regulatory compliance by standardizing and monitoring repetitive tasks (Syed et al., 2020; Ansari et al., 2019). Ease of use and implementation is also frequently noted, with RPA tools being described as user-friendly, low-code, and non-invasive, allowing organizations to integrate automation without major system overhauls (Ansari et al., 2019; Syed et al., 2020). Lastly, RPA offers substantial advantages in terms of enterprise security and auditability. The use of orchestrators facilitates centralized control, logging, and compliance tracking, supporting secure execution in alignment with governance and certification requirements (Ansari et al., 2019; Syed et al., 2020)…

3.2 Operational Efficiency and Automation

A recurring theme observed across the extensive array of literature is the continual exploration of operational efficiency and automation integration. The works of Santos et al. (2020), Costa et al. (2022), Syed et al. (2020), Flechsig et al. (2022), Plattfaut and Borghoff (2022), alongside Radke et al. (2020), Pramod (2022) and Brzeziński (2022) collectively provide insights into the multifaceted dimensions of this overarching theme. RPA is positioned as a pivotal catalyst by Santos et al (2020), facilitating continuous 24/7 availability, thereby mitigating errors and expediting the seamless deployment of novel functionalities within organizational frameworks. This assertion finds resonance in the work of Costa et al (2022), who emphasize the transformative role of RPA in enhancing scalability and freeing employees to allocate their cognitive resources to more mission-critical tasks.

Furthermore, In the works presented by Syed et al. (2020), Flechsig et al (2022), and Plattfaut & Borghoff (2022) collectively aligns with the prevailing consensus that RPA encompasses substantial time savings and fosters efficient information exchange, thereby significantly contributing to the realization of operational excellence. The concurrence among these scholars underscores the universal acknowledgment of RPA as an indispensable instrument in the pursuit of organizational efficiency. Where the overarching objective is to streamline processes, minimize human errors, and cultivate an environment conducive to sustained operational advancement. This comprehensive exploration delves into the intricacies of RPA's impact on operational dynamics, illuminating its role as a driving force in the contemporary landscape of automation and efficiency enhancement.

3.3 Cost Savings and Resource Efficiency

RPA has garnered recognition in academic discourse for its perceived potential to drive cost savings and enhance overall resource efficiency. In the work by Santos et al. (2020), emphasis is placed on the reduction of error rates as a core feature of RPA, contributing to noticeable improvements in cost-effectiveness. This insight is expanded upon by Costa et al. (2022), who highlight RPA's transformative capacity in not only mitigating error rates but also substantially reducing process hours, leading to a more streamlined and efficient operational framework. The multifaceted impact of RPA on organizational processes, through the combined effects of error reduction and process optimization, is highlighted as contributing to tangible cost savings.

Building on these findings Pramod (2022) complements these observations by accentuating the broader implications of RPA implementation. The focus extends beyond cost-effectiveness, encompassing the realization of resource savings and a marked improvement in overall productivity. Pramod's examination delves into the intricate interplay between RPA and resource allocation,

elucidating how the strategic integration of automation technologies facilitates the optimization of workforce capabilities and, consequently, augments productivity levels. The holistic perspective presented by Pramod(2022) reinforces the idea that RPA extends beyond simple cost reduction. It serves as a strategic enabler by streamlining repetitive workflows, improving data accuracy, and freeing human resources for more value-added activities. These outcomes support longer-term operational efficiency and financial sustainability.

3.4 Enhanced Productivity and Creativity

In the context of enhanced productivity and creativity, the literature suggests that RPA can reshape the workforce's role. Syed et al. (2020) state that RPA can free employees from mundane, repetitive tasks, allowing them to engage in more insightful and creative endeavours. Furthermore, Costa et al. (2022) and Penttinen et al. (2018) concur that the implementation of RPA can contribute to increased productivity and improve overall work organization. These benefits highlight RPA's role in empowering employees to focus on value-added tasks and foster creativity.

The literature highlights how RPA can significantly reshape workforce responsibilities by enhancing productivity and supporting more creative, value-added work. As articulated by Syed et al. (2020), the contention emerges that the integration of RPA into organizational frameworks possesses the capacity to liberate employees from the shackles of mundane and repetitive tasks, thereby affording them the opportunity to delve into more profound, insightful, and creatively demanding pursuits. This perspective aligns with the overarching theme that RPA acts as a catalyst for a paradigm shift in the nature of work undertaken by individuals within an organization.

Costa et al. (2022) and Penttinen et al. (2018) further support the idea that RPA does more than reduce repetitive work; it also leads to clear improvements in productivity and how organizations structure their processes. These researchers concur in their findings, positing that the strategic incorporation of RPA technologies stands poised to yield a dual dividend, manifesting as heightened productivity levels while concurrently refining the overall architecture of work processes. This dualistic outcome underscores RPA's multifaceted role in not only liberating human capital from repetitive drudgery but also in actively contributing to the optimization of broader organizational workflows.

As a result, employees are empowered to shift their focus toward more meaningful and intellectually engaging tasks. The nuanced facilitation of value-added activities, as underscored by the insights gleaned from the literature, positions RPA as an enabler of heightened creativity and innovation within the workforce. In synthesizing the perspectives presented by Syed et al. (2020), Costa et al. (2022), and Penttinen et al. (2018), a comprehensive narrative emerges, affirming the integral role played by RPA in reshaping the contours of modern work dynamics and inextricably linking enhanced productivity with a paradigmatic shift towards more insightful, creative, and value-driven endeavours for employees.

3.5 Risk Management and Compliance

Risk management and compliance are crucial aspects of how businesses operate, requiring continuous attention and care. It's an ongoing challenge for companies to keep up with high standards of operational quality, manage risks effectively, and follow the rules and regulations that apply to their industry. Syed et al. (2020) and Ansari et al. (2019) point out the important role that RPA can play in dealing with these challenges. They highlight that RPA is not only good at reducing risks but also at making sure businesses stick to the rules.

RPA, as explained by these authors, is like a helpful tool that can bring significant benefits to businesses dealing with the complexities of risk management and compliance. By using RPA in their operations,

companies can reduce mistakes and make things work more efficiently. This doesn't just make the services better, but it also shows that the company is committed to following the detailed rules that apply to their industry. In summary RPA becomes a dependable tool that helps businesses find their way through the complicated world of following rules while also lessening the potential impact of operational risks. Integrating RPA allows businesses to take a careful and practical approach to risk management and compliance, aligning their strategies with the needs of a constantly changing business environment.

3.6 Ease of Use and Implementation

One of RPA's notable advantages is its user-friendliness and ease of implementation. Ansari et al. (2019) asserts that RPA software is straightforward to configure and operate. This non-invasive technology integrates seamlessly with existing systems, eliminating the need for extensive development efforts. Furthermore, the user-friendly interface enables the creation of automated processes by dragging and dropping steps, generating code automatically. Integration with legacy systems is smooth, streamlining the implementation process and contributing to enhanced operational efficiency.

RPA is distinguished in the contemporary tech landscape for its remarkable simplicity in use and seamless implementation, as explained by Ansari et al. (2019). This technological advancement not only offers user-friendly functionalities but also presents a straightforward integration process that significantly contributes to operational efficiency.

Ansari et al. (2019) states that RPA software is easy in both configuration and operation, this unveils a crucial aspect of its user-centric design. The simplicity in navigating the RPA software interface empowers users with varying technical backgrounds to utilize its capabilities effectively. This accessibility is particularly advantageous in organizational settings, where individuals with diverse skill sets collaborate on automating various processes. The non-invasive nature of RPA, highlighted by Ansari et al. (2019), further reinforces its user-friendly profile. This characteristic ensures that the implementation of RPA does not disrupt existing systems, alleviating concerns related to potential conflicts and minimizing the need for extensive training programs.

A noteworthy attribute contributing to the ease of implementation is RPA's integration with pre-existing systems. The compatibility with legacy systems ensures a harmonious amalgamation, obviating the need for substantial adjustments or overhauls. This synergy fosters a cohesive environment where RPA functions as an augmentative force rather than a disruptive element in organizational workflows. The streamlined integration process minimizes downtime, enabling swift transitions and thereby enhancing overall operational agility.

The practicality of RPA is further exemplified by its intuitive interface, allowing users to create automated processes effortlessly. The drag-and-drop functionality facilitates the assembly of procedural steps with ease, making the automation of complex tasks an accessible endeavour. This user-centric approach not only expedites the implementation process but also democratizes the automation capabilities within an organization, empowering users across departments to contribute to process optimization.

In summation, the multifaceted ease of use and implementation of RPA, as articulated by Ansari et al. (2019), encompasses a holistic approach that includes compatibility, accessibility, and efficiency, positioning RPA as a transformative technology capable of optimizing operational workflows across diverse organizational landscapes.

3.7 Security and Enterprise-Safety

The consideration of security and enterprise safety assumes importance in the evaluation and assimilation of technological innovations, as presented by Syed et al. (2020) and Ansari et al. (2019). The interfacing of RPA software with diverse systems, executed through the presentation layer, minimizes negative impacts upon extant software infrastructures with precision.

The orchestration capabilities intrinsic to the RPA paradigm contribute to the fulfilment of enterprise requisites, encompassing dimensions such as security, scalability, and auditability. The utilization of orchestrators creates a paradigm of centralized processing aligning with multifaceted exigencies inherent in contemporary enterprises. This centralized orchestration, beyond augmenting the operational efficiency of RPA, is instrumental in ensuring adherence to extant corporate standards. The acknowledgment of RPA as an enterprise-safe solution transcends theoretical abstraction, manifesting palpably as a technological entity with the capacity to furnish a secure and scalable automation platform congruent with established corporate norms.

In summation, the indication on the robust security features to RPA underscores its pertinence for organizations navigating the intricate contours of digital transformation. The precision in system interfacing, coupled with orchestration capabilities, positions RPA as an apt solution addressing the numerous imperatives of security, scalability, and auditability within the contemporary milieu of enterprise dynamics. The ascription of enterprise-safe status to RPA, far from being a nominal attribution, conveys its substantive import as an astute and secure automation platform, poised to address the evolving exigencies of organizations within the dynamic technological milieu.

3.8 Conclusion

RPA has emerged as a transformative technology, gaining recognition for its quantifiable advantages in operational efficiency, cost savings, enhanced productivity, and risk management. The literature indicates a consensus on RPA's potential to drive increased productivity by automating routine tasks, resulting in significant cost savings ranging from 30–80 percent and impressive ROIs between 650 and 800 percent. RPA is portrayed as a catalyst for operational excellence, providing continuous 24/7 availability and mitigating errors.

Furthermore, RPA is highlighted for its role in cost reduction, resource efficiency, and optimization of workforce capabilities. It is seen not just as a cost-cutting measure but as a strategic enabler fostering an environment of enhanced operational efficiency and financial prudence. The integration of RPA is portrayed as user-friendly, with straightforward implementation and a non-invasive nature, allowing seamless integration with existing systems. This ease of use democratizes automation capabilities across diverse organizational landscapes.

In the context of enhanced productivity and creativity, RPA is depicted as a transformative force that frees employees from mundane tasks, enabling them to engage in more insightful and creative endeavours. The literature emphasizes RPA's dual role in not only alleviating monotony but also actively contributing to heightened productivity levels and organizational structuring.

Risk management and compliance are recognized as crucial aspects of RPA's impact, with the technology seen as a helpful tool in reducing risks and ensuring adherence to industry regulations. RPA is positioned as a dependable tool that helps businesses navigate the complexities of following rules while lessening the potential impact of operational risks.

Lastly, security and enterprise-safe considerations are highlighted as essential components of RPA's evaluation and assimilation. The interfacing of RPA with diverse systems is emphasized for minimizing negative impacts on existing software infrastructures. The orchestration capabilities of RPA contribute

to fulfilling enterprise requisites, ensuring security, scalability, and auditability within the contemporary dynamic technological landscape.

In summary, the literature underscores RPA's multifaceted benefits, positioning it as a strategic technology for organizations seeking to streamline operations, enhance efficiency, and navigate the challenges of the modern business landscape.

3.9 Model for RPA Outcome and Benefit Prediction

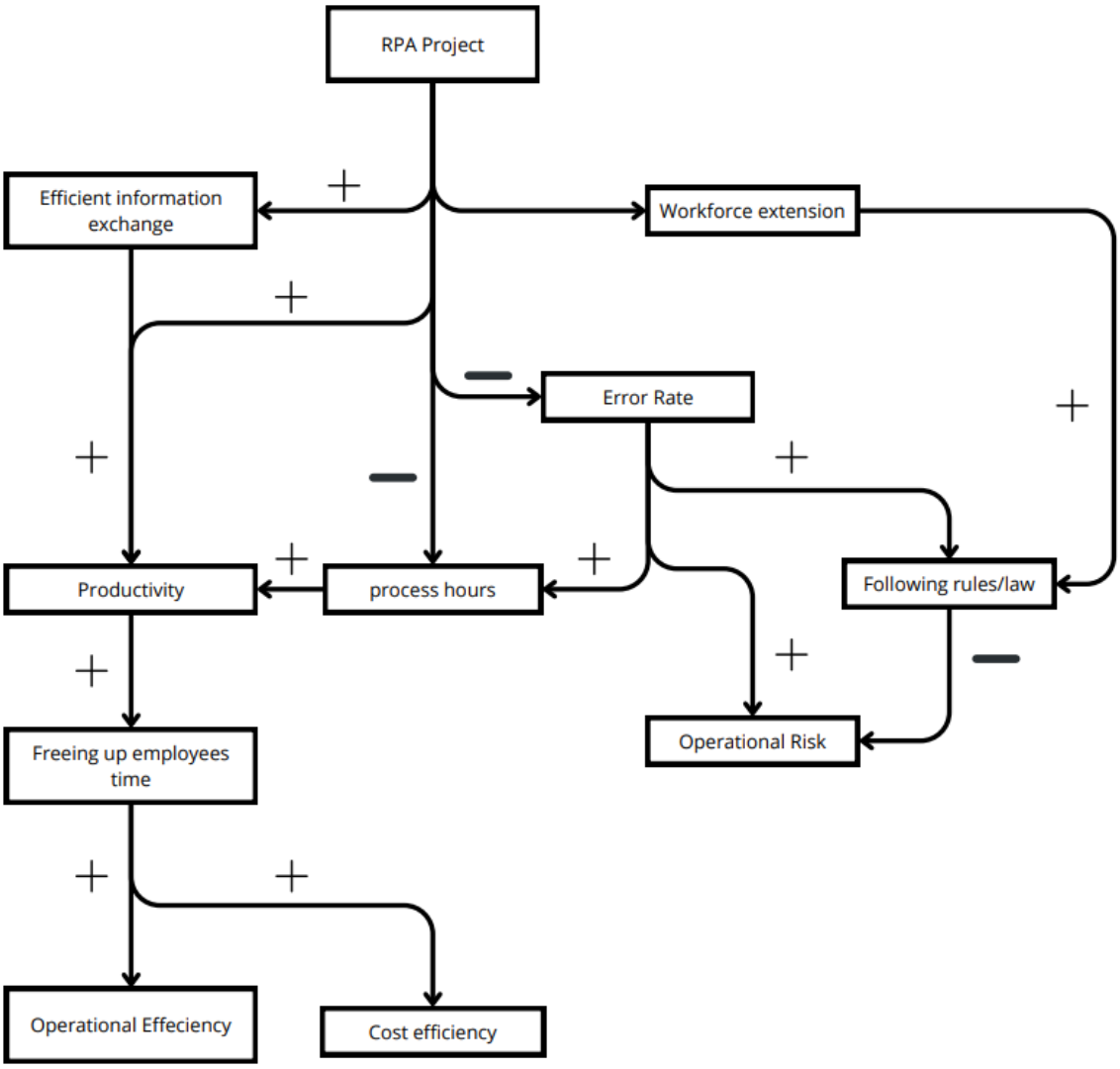


Figure 4 RPA Outcome and Benefit Prediction Model

Figure 4 outlines an Outcome and Benefit Prediction Model for RPA projects. In the context of this model, outcomes refer to the direct operational effects of implementing RPA, such as reduced processing time, improved accuracy, and increased task throughput. Benefits are the broader organizational gains that stem from these outcomes, including cost savings, improved compliance, and enhanced workforce productivity. The predictors include process characteristics (e.g., rule-based, high-volume tasks), technological readiness, and organizational factors such as employee engagement and system integration capability. These categories were derived from patterns identified in the literature review, which consolidated findings across academic studies on RPA feasibility, impact metrics, and implementation challenges (e.g., Syed et al., 2020; Costa et al., 2022; Pramod, 2022). The model brings these factors together to offer a structured lens for evaluating whether an RPA initiative is likely to deliver the expected benefits in a specific SME context. The model serves as a tool to evaluate these predictors prior to implementation, enabling organizations to assess the likely success and value of RPA projects in advance. The flowchart provided illustrates how automation can serve as a tool for productivity, cost savings, and compliance, while also supporting long-term operational goals.

At the core of the framework is the role of RPA in automating repetitive, rule-based tasks. This shift enables employees to allocate their time to more complex and strategic activities, reducing the reliance on manual processes. This reallocation of efforts enhances overall productivity, as tasks are completed more efficiently and with greater accuracy. The automation of these processes contributes to reducing operational delays and errors, which are common in manual workflows.

The flowchart highlights a direct link between RPA-driven automation and cost efficiency. By reducing the need for extensive manual labour and lowering the likelihood of costly errors, organizations can achieve measurable financial savings. These savings are not just a byproduct of efficiency but can also be reinvested into other strategic areas, enabling the organization to adapt and innovate more effectively.

A feature of the framework is the concept of "workforce extension." RPA functions as a digital workforce, complementing human employees by handling high-volume, repetitive tasks. This not only increases the capacity to manage workloads but also allows organizations to scale operations without proportionally increasing headcount. This balance of human and digital labour ensures that resources are optimized while maintaining flexibility to address fluctuating demands.

Another important aspect of the framework is the improvement of information exchange across systems and departments. By automating data processing and communication, RPA reduces inefficiencies and ensures a seamless flow of information. This enhanced connectivity supports collaboration and decision-making within the organization.

The reduction of error rates and process times plays a significant role in improving operational efficiency, as depicted in the flowchart. Automation ensures consistent adherence to predefined rules, which minimizes mistakes and increases reliability. This precision also supports compliance with legal and regulatory requirements, reducing the risks associated with non-compliance.

Operational efficiency, as a central element of the flowchart, ties together the benefits of RPA. Fewer errors and faster task completion lead to improved reliability and output, which in turn helps mitigate risks associated with inconsistent performance or external regulatory scrutiny. By fostering a systemized approach, RPA provides the tools to address these challenges while maintaining flexibility to adapt to new opportunities or challenges.

The framework presented emphasizes how RPA can serve as a strategic enabler rather than just a cost-cutting measure. The interconnections outlined in the flowchart suggest that automation has the potential to transform workflows, enhance productivity, and support sustainable growth. By integrating RPA into its operations, an organization can position itself to be more efficient, responsive, and competitive in a rapidly evolving business landscape.

4. Iteration 2: Expert Interviews and Model Refinement

This chapter presents the second iteration of the research, focused on validating and developing the initial framework through expert interviews. Section 4.1 introduces the purpose and scope of the interviews. Section 4.2 discusses the alignment between literature-based assumptions and practical insights. Section 4.3 identifies sector-specific barriers to RPA implementation, while Section 4.4 explores broader strategic considerations emerging from practice. Section 4.5 outlines expert recommendations for model improvement, and Section 4.6 presents the revised RPA Outcome and Benefit Prediction Model. Section 4.7 concludes the iteration. This chapter addresses sub-RQ3 How do expert perspectives align with or challenge the model derived from literature? And sub-RQ4 What adjustments are necessary to improve the model's applicability in the SME freight forwarding context?

4.1 Introduction

The implementation of RPA has been widely discussed in the literature, emphasizing its potential benefits in terms of efficiency, error reduction, and productivity gains as described in the literature review. However, as automation technologies evolve, the practical application of RPA across various industries presents both opportunities and challenges. To bridge the gap between theoretical insights and real-world applications, a series of expert interviews were conducted with professionals from diverse sectors, including logistics, accountancy, marketing and IT.

Table 2 provides an overview of the experts, their background, and the reason for involvement.

Expert ID	Sector/Industry	Role	Reason for Involvement
Expert 1	Accountancy / Financial Services	Accountancy Firm Owner & Automation Consultant	Hands-on experience with RPA in accountancy
Expert 2	Air Freight / Logistics	Product & Service Manager	Extensive practical knowledge of RPA in freight operations
Expert 3	Logistics Software Consulting	Logistics IT Consultant	Field experience implementing logistics automation systems
Expert 4	IT Services / Automation	Software Company Owner	Technical experience with RPA solutions across sectors
Expert 5	Marketing and Digital Services	Marketing Agency Owner	Experience with automation in marketing and back-office tasks

Table 2 Overview of expert participants

The objective of these interviews was to assess the extent to which the proposed RPA benefit prediction model aligns with actual business practices and to identify areas for refinement. By systematically evaluating expert perspectives, it becomes possible to integrate their insights into the existing framework, ensuring a more robust and applicable model. …

4.2 Consistency Between Literature and Practical Insights

The findings from the expert interviews largely align with the academic literature regarding the expected benefits of RPA implementation. Consistent with the literature, all experts emphasized the role of RPA in improving operational efficiency by automating routine, rule-based tasks. Expert 1 confirmed this, noting that " 'Freeing up employees' time" is obviously a result of increased productivity and reduced process hours. That's already a time saver for the organization" (Appendix G, 00:26:54). Similarly, Expert 2 emphasized that automation not only reduced workload but also enabled staff to focus on more strategic tasks, reinforcing the idea that RPA serves as a workforce extender rather than a replacement tool.

Error reduction was also shown in practice. Expert 1, working in the accountancy domain, underscored how automation enhanced accuracy in financial workflows, contributing to both internal quality control and compliance with external standards. This is I line with the findings in Santos et al. (2020) and Costa et al. (2022), which associate RPA with lower process error rates and improved auditability.

The link between RPA and regulatory compliance was present in highly regulated sectors. Both Expert 1 and Expert 4 noted that compliance is not only driven by internal procedures but also by requirements imposed by clients or regulatory bodies. As Expert 4 explained, RPA implementations must often meet external certification standards, such as ISO requirements, adding complexity to vendor selection and integration decisions.

While these core benefits were consistently validated, experts also highlighted sector-specific limitations not sufficiently addressed in existing models. As Expert 2 explained, the logistics environment is often fragmented across different software systems, making integration a persistent challenge. While RPA can bridge some gaps, it is not a comprehensive solution to system incompatibility (Appendix H). Likewise, Expert 3 stressed the importance of interoperability, particularly in cases where older legacy systems are still in operation.

In sum, the expert interviews confirmed the claims in the literature while surfacing practical constraints that necessitate a more context-aware and adaptive model.

4.3 Sector-Specific Implementation Barriers

The practical application of RPA remains highly dependent on the industry context. In the logistics sector, it was observed that many companies continue to rely on traditional, manual planning methods, particularly in transportation management. While literature suggests that RPA can alleviate inefficiencies in supply chain processes, Expert 2 and Expert 3 expressed concerns regarding the adaptability of automation solutions to legacy systems. This suggests that a key limitation in the existing model is its assumption of seamless technological integration, which does not always align with the operational realities of businesses that depend on outdated infrastructure.

In contrast, the accountancy sector has shown greater receptiveness to automation, particularly in repetitive and standardized tasks such as invoice processing and compliance reporting. However, Expert 1 emphasized that automation should not be viewed as a static implementation but rather as an evolving process that requires continuous monitoring and refinement. As they noted, “What I might be missing in this model is maybe the feedback from usage within the organization… What changes do you implement afterward to make sure that error doesn’t happen again?” (Appendix G, 00:22:08). The absence of a structured feedback mechanism in the existing model was identified as a limitation, as it fails to account for the iterative nature of automation adoption. This necessitates the inclusion of a post-implementation evaluation phase, wherein organizations can systematically assess the effectiveness of RPA applications and make necessary adjustments to optimize performance.

The marketing and media sector presents a different challenge, where automation is less focused on compliance and more on customer engagement and content management. Here, the primary concern raised in the interviews was the cultural resistance to automation within organizations. Expert 5 noted that employees often perceive automation as a threat to job security rather than as an enabler of efficiency. While the literature acknowledges change management as a consideration in RPA adoption (Syed at al., 2020), the proposed model does not explicitly address organizational culture and employee adaptation. This suggests a need to incorporate a structured approach to change management, ensuring that automation is positioned as an enhancement rather than a replacement for human labor.

Additionally, the IT security expert noted that data integrity and long-term system maintenance pose unique challenges in RPA deployment. Over time, software updates, regulatory shifts, and modifications in internal workflows can create inconsistencies in automated processes. Expert 4 described the necessity of conducting periodic audits, akin to an RPA maintenance cycle, to ensure that automation remains aligned with operational requirements. This suggests that the model should integrate a structured maintenance and oversight component to monitor the ongoing reliability and compliance of RPA implementations.

One of the insights emerging from the expert interviews is the strategic dimension of RPA implementation. While the literature tends to focus on automation as a means of achieving operational efficiency, industry professionals emphasized that its application varies based on economic and organizational conditions. In periods of economic expansion, RPA can facilitate innovation by reallocating resources toward strategic initiatives. Conversely, during times of financial constraint, automation is often leveraged as a cost-cutting measure, leading to workforce reductions. The current model does not account for these macroeconomic considerations, suggesting the need for a more flexible framework that acknowledges the dual role of automation in both fostering innovation and enabling cost efficiencies.

Additionally, the experts proposed that the model should differentiate in how elaborate it is between operational and strategic levels of RPA application. Depending on the user of the model. While automation is primarily discussed in the literature as a tool for improving efficiency, interviewees noted that at higher management levels, RPA serves as a decision-support mechanism. In the air freight sector, for example, automation is employed not only to streamline pricing and contract management but also to provide predictive insights based on historical data. This suggests that the model should distinguish between automation's impact on routine task execution and its potential as an analytical tool for business intelligence.

Moreover, the concept of workforce scalability and adaptability in automation, particularly concerning the onboarding of new employees. The experts observed that well-designed RPA implementations create structured knowledge repositories, enabling new hires to quickly familiarize themselves with organizational workflows. This insight suggests that the model should incorporate a workforce scalability metric, ensuring that automation not only reduces manual workload but also facilitates knowledge transfer and long-term skill development.

Furthermore, it was widely agreed among interviewees that the current model lacks adaptability across industries. While the framework is theoretically comprehensive, its rigid structure does not allow for sector-specific modifications. A modular approach, whereby companies can select and prioritize relevant components based on their unique operational needs, may enhance the model's applicability. Such flexibility would enable organizations to integrate RPA incrementally, reducing resistance and ensuring a smoother transition.

4.4 Recommendations for Model Enhancement

The evaluation of expert interviews in relation to the existing literature has reinforced the fundamental principles underpinning RPA while highlighting key areas for refinement in the proposed model. The insights gathered underscore the need for a more nuanced approach that accommodates industry-specific barriers, cultural considerations, and strategic implications. To address these gaps, several modifications are recommended.

First, a feedback mechanism should be integrated into the model to allow organizations to assess and refine automation processes iteratively. This would ensure that RPA implementations remain aligned with evolving business needs and regulatory requirements.

Second, the model should explicitly incorporate change management strategies, recognizing that employee adaptation plays a crucial role in the success of automation projects. Clear communication and training initiatives should be embedded in the framework to mitigate resistance and enhance workforce engagement.

Third, a structured system maintenance and oversight mechanism should be incorporated to periodically audit and fine-tune RPA processes, ensuring their continued reliability and compliance with industry regulations.

Fourth, the model should include a workforce scalability component, capturing how automation can be leveraged not only to improve efficiency but also to streamline employee onboarding and long-term workforce development.

By integrating these refinements, the proposed model will better reflect the complexities of RPA implementation, ensuring closer alignment with real-world business environments. These modifications will enhance the model's effectiveness as a predictive tool while fostering a more comprehensive and adaptable approach to automation adoption.

4.5 Revised Model for Outcome and Benefit Prediction

Figure 5 depicts the revised model of the RPA Outcome and Benefit Prediction Model. Compared to the initial model, the revised model incorporates several enhancements based on expert insights and recommendations identified in Section 4.4. A structured RPA Control Maintenance feedback loop has been integrated, reflecting the necessity of periodic oversight and system audits to ensure continuous alignment with operational and regulatory demands. Additionally, the revised model explicitly includes a Workforce Scalability component, linked to onboarding and knowledge sharing, acknowledging automation's potential to improve employee integration and workforce efficiency. Furthermore, a clearer distinction between Workforce Efficiency and overall Operational Efficiency has been introduced, emphasizing the interplay between employee performance and process optimization. Collectively, these refinements provide a more comprehensive, practical, and adaptive framework,

aligning the model closely with real-world RPA implementation dynamics and addressing key gaps highlighted by expert interviews.

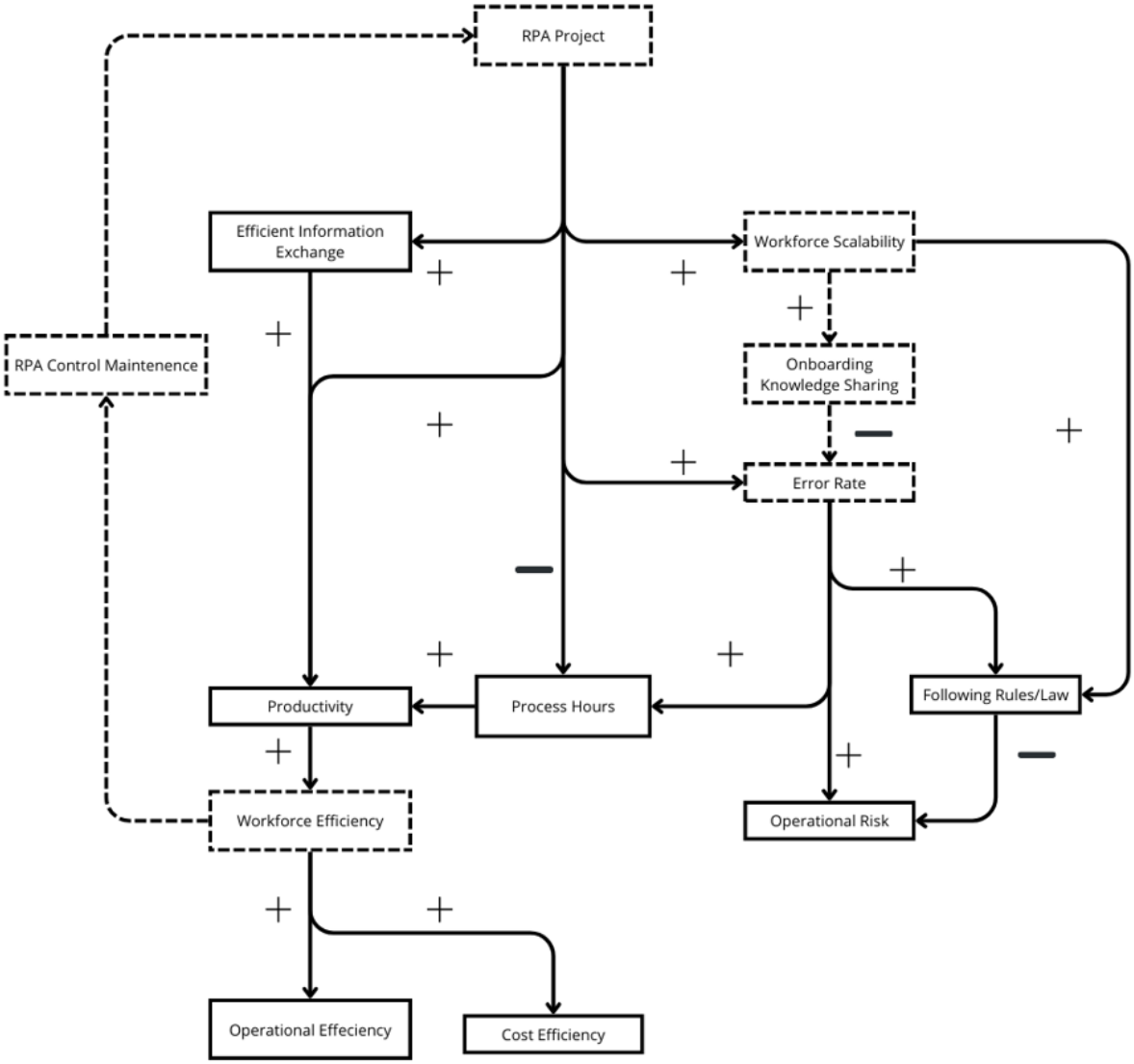


Figure 5 Revised RPA Outcome and Benefit Prediction Model with expert interview enhancements

4.6 Conclusion

This chapter presented the second iteration of the research, focusing on the refinement of the initial RPA Outcome and Benefit Prediction Model through expert interviews. The qualitative insights gathered from five domain experts provided empirical grounding to assess the applicability and completeness of the model derived from the literature review.

Sub-RQ3: How do expert perspectives align with or challenge the model derived from literature?

The expert interviews broadly confirmed the theoretical constructs of the initial model, particularly regarding RPA's impact on productivity, error reduction, compliance, and cost efficiency. For example, Expert 1 emphasized that automation significantly reduces error rates and increases productivity in accountancy workflows, while Expert 2 validated RPA's role in improving process standardization and regulatory adherence in logistics. However, experts also highlighted sector-specific challenges that

exposed gaps in the model's assumptions, notably, the difficulty of integrating RPA with legacy systems (Expert 3), the absence of feedback loops to support continuous improvement (Expert 1), and organizational resistance due to cultural and workforce concerns (Expert 5).

Sub-RQ4: What adjustments are necessary to improve the model's applicability in the SME freight forwarding context?

The findings resulted in several concrete recommendations for model enhancement, as detailed in Section 4.4. Key adjustments include the addition of a feedback mechanism to support iterative refinement, the inclusion of change management strategies to address employee adaptation, and the incorporation of a system maintenance loop to ensure long-term compliance and alignment with evolving operational requirements. Furthermore, a workforce scalability component was added to reflect automation's potential to support onboarding and knowledge sharing, an aspect that aligns well with SME constraints in logistics and freight forwarding.

These refinements were integrated into a revised version of the predictive model (Figure 5), presented in Section 4.5. The updated model captures not only the functional benefits of RPA but also addresses the organizational, technological, and human factors that emerged as critical in practice. This iteration brings the model closer to real-world applicability.

5. Case Study: RPA Implementation in a Micro-Sized Freight Forwarder

This chapter presents the evaluation, in which the revised RPA Outcome and Benefit Prediction Model is applied and evaluated in a real-world setting. Section 5.1 introduces the case company and its operational context. Section 5.2 outlines the process selection, including the rationale and criteria used to identify a suitable candidate for automation. Section 5.3 describes the design of the RPA solution and its alignment with the predictive model. Section 5.4 discusses the anticipated outcomes prior to implementation, based on model-driven expectations. Section 5.5 presents the implementation process and the ex-post evaluation of the realized benefits. Finally, Section 5.6 summarizes the findings and reflects on the case's implications for the model and for RPA adoption in SME logistics environments.

5.1 Company profile

The subject of this case study is a small freight forwarding company operating within the European logistics sector. Based on the European Commission's classification of enterprise size, the company falls within the micro-enterprise category, with annual revenues below the €2 million threshold and a limited number of employees. Its core business activities involve managing the transportation of goods and facilitating coordination between suppliers, carriers, and customers. As a micro-sized entity, the company faces several operational constraints, particularly in workflow management. Many of its core processes continue to rely heavily on manual input and verification, resulting in potential inefficiencies, increased administrative burden, and a heightened risk of human error. These challenges make the organization a representative case for exploring the feasibility and impact of process automation within resource-constrained logistics environments.

5.2 RPA Use Case Selection

During an initial assessment in the early stages of the project, informal conversations with operational staff were used to identify automation opportunities and highlight areas of inefficiency. Although these discussions did not constitute formal qualitative data collection, they revealed a shared perception that the invoicing process was particularly time-consuming, repetitive, and prone to error. Based on these practitioner insights, the process of handling inbound invoices and allocating associated costs to existing orders was selected as a candidate for RPA intervention. This selection aligns with established RPA suitability criteria. Such as rule-based structure, high volume, and low variation. This reflects common practices in SME environments, where process identification is often guided by practitioner knowledge rather than formal process mining techniques. This process involves the handling of inbound invoices and the accurate allocation of associated costs to existing orders. Employees reported that a considerable amount of time was spent processing invoices, with a high risk of human errors necessitating frequent manual intervention to identify, verify, and correct discrepancies. The inefficiencies within this workflow not only contributed to delays but also increased the likelihood of financial inaccuracies.

The manual invoicing process begins with the receipt of invoices from various suppliers providing transportation and logistics services. Employees are responsible for manually matching each invoice with the corresponding order to ensure that the billed amounts align with the agreed-upon costs. Upon verification, the associated costs are manually recorded within the company's internal financial system. When discrepancies arise, such as missing order references, incorrect billing amounts, or unapproved charges, employees are required to flag the invoices and undertake corrective actions. This includes identifying the source of the discrepancy and, where applicable, adding surcharges or additional costs to the corresponding customer order to ensure accurate billing. The final stage of the

process involves notifying relevant personnel of inconsistencies and confirming that all issues are resolved before financial records are finalized and the inbound invoice is approved for payment. A brief overview can be found below in Figure 6.

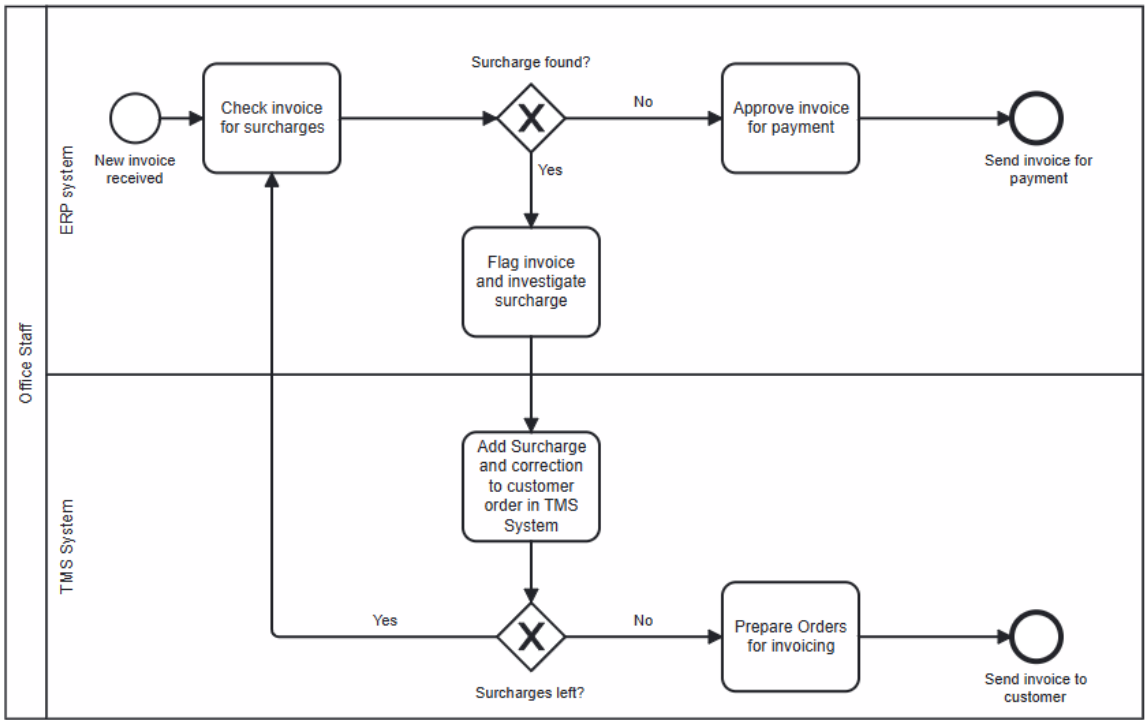


Figure 6 BPMN flowchart surcharge process

5.3 RPA Solution Design

To address these challenges and improve operational efficiency, an RPA solution was proposed for implementation. The automation system is initiated once a new invoice is received and stored in the ERP system. The RPA bot scans the invoice and extracts relevant data fields, including supplier information, order numbers, and cost breakdowns. It then checks the invoice for surcharges or discrepancies. If any mismatches are detected, the bot generates a structured overview and sends an automated email containing both the original invoice and the identified surcharge data. This information is reviewed by office staff and forwarded to the Transport Management System (TMS), where surcharges and corrections are applied to the corresponding customer order. Once updated, the orders are prepared for invoicing, ensuring that the customer receives an accurate and complete invoice. If no discrepancies are found, the invoice is directly approved for payment.

5.4 RPA Outcome and Benefit Prediction

The anticipated benefits of implementing the RPA solution were evaluated ex-ante using the predictive model developed in Chapter 4. This model provided a structured framework to estimate expected outcomes based on process improvements and their downstream effects. Several variables from the model were used to anticipate the impact of the automation initiative on the company's invoicing process.

The predictive model consists of several dimensions such as task complexity, error sensitivity, process volume, and exception handling. that were used as lenses to assess the feasibility and expected benefits of automating the invoicing process. Each variable was mapped against the characteristics of the target process. For example, the repetitive and rule-based nature of cost matching aligned strongly

with the model's "process structure" criteria, while the frequency of manual corrections highlighted the "error risk" dimension. These characteristics allowed to anticipate potential outcomes, such as time savings and error reduction. Additionally, the model's inclusion of maintenance and scalability indicators informed the design of exception reporting and oversight mechanisms within the RPA system.

First, reduction in manual processing time was expected. The current process requires employees to spend an estimated 3 hours per week on data verification and cost allocation. This reduction in process hours was expected to have a direct positive effect on overall productivity, as employees could shift their focus toward higher-value, non-repetitive tasks. According to the model, such an increase in productivity would also contribute to gains in both workforce efficiency and cost efficiency.

In addition, the automation system was expected to reduce the frequency of human errors, particularly those related to misallocated costs, missing references, or incorrect billing amounts. These errors previously required manual resolution and presented a risk to accurate financial reporting. In the model, a lower error rate is linked to improved compliance with billing regulations and a subsequent reduction in operational risk.

Another element of the model addressed the importance of control and oversight in sustaining automation outcomes. The implemented solution includes mechanisms to review flagged mismatches and iteratively adjust exception handling logic, supporting the ongoing maintenance of the RPA system. This feedback loop is reflected in the model as RPA control maintenance, which contributes to long-term operational alignment and system reliability.

While not the primary focus of the case, the model also outlines the potential for RPA to support workforce scalability and onboarding through structured knowledge transfer. By generating standardized outputs such as surcharge reports and discrepancy summaries, the automation supports internal information sharing and reduces the reliance on individual expertise.

Taken together, the predictive model helped define and structure expectations regarding the impact of the RPA solution. It facilitated early identification of areas of improvement, such as time savings and error reduction, while also accounting for broader operational and compliance-related benefits. This ex-ante evaluation supported both the business case and the design of the RPA implementation.

5.5 RPA Implementation and Evaluation

The RPA implementation was designed to automate the initial stages of the company's manual invoice handling process. As illustrated in Figure 7, the automation is encapsulated within a subgroup labeled "RPA Solution" which operates within the scope of the ERP system and office staff responsibilities.

Although the RPA was not designed using the predictive model as a technical specification, the model did inform several key design decisions. For instance, the model's emphasis on task structure, exception handling, and error sensitivity guided the inclusion of discrepancy detection, rule-based matching, and oversight mechanisms in the RPA logic. Furthermore, the BPMN model served as a practical tool for mapping and validating process suitability, aligning with the model's feasibility criteria. In this sense, the predictive framework not only supported the ex-ante evaluation of outcomes but also influenced the conceptual and operational design of the RPA implementation.

The process begins when a new invoice is received by the company. At this point, the RPA bot is triggered to initiate a set of automated tasks. The first step is to check the invoice for potential surcharges, such as additional transport-related costs that may not have been captured in the original order. This step functions as the primary decision-making logic in the automation flow.

If no surcharges are found, the process proceeds directly to invoice approval and payment stage. However, if a surcharge is detected, the automation creates a separate structured report detailing the discrepancy. This report includes an overview of the surcharge amounts in relation to the original invoice and the accompanied order references in the TMS Following this, the RPA bot sends an automated email to designated internal personnel. The email includes both the original invoice and the surcharge report, providing a standardized and timely notification of the discrepancy for further action. Simultaneously, the original invoice is sent to a central database for archival and internal reference.

Tasks that fall outside the scope of automation, such as the adjustment of customer orders in the TMS system and the preparation of outbound invoices, are handled by office staff and existing systems. These remain manual or semi-automated processes that follow after the RPA subprocess.

The RPA component is modular in nature, As can be seen in Appendix L, where there are three individual workflows operating together. They target the most repetitive and error-prone aspects of the invoicing workflow. Its implementation aims to increase accuracy, reduce processing time, and improve the consistency of internal communication regarding billing exceptions. The solution was designed with maintainability in mind, supporting future adaptations as business logic or exception handling needs evolve. …

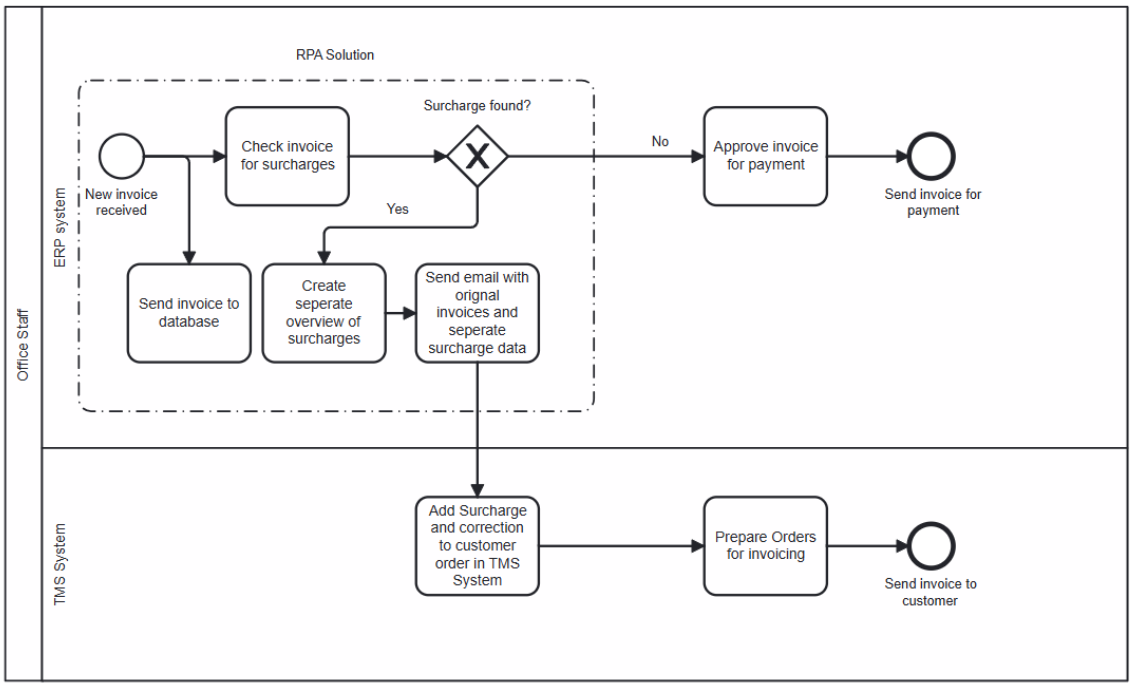


Figure 7 BPMN flowchart surcharge process with RPA

The implementation of the RPA solution was evaluated ex-post using the predictive model developed in Chapter 4. The model provided a structured basis for assessing outcome realization in relation to process efficiency, error reduction, and operational benefits.

The total development time for the RPA solution was approximately 13 hours. Prior to implementation, the invoice handling process required an estimated 180 minutes of manual processing per week. Following automation, the total weekly process time has been reduced to approximately 50 minutes,

resulting in a time savings of roughly 72 percent for the total process. This improvement reflects a substantial gain in operational efficiency with minimal implementation overhead.

At the task level, the automation has significantly reduced the average duration per invoice. Previously, employees spent between 100 and 130 minutes manually matching, verifying, and processing each invoice. The automated process now performs these tasks in approximately one minute per invoice. This represents an efficiency improvement of 99,2 percent. While human intervention is still required for certain exceptions, the overall burden on administrative staff has been substantially reduced. Moreover, the benefit arises because the automation has created a background process.

These gains align with the model's assumptions about the relationship between reduced process hours and increased workforce efficiency. Employees are now able to redirect their time to tasks that require judgment or complex coordination. In addition, the automation has introduced greater consistency in exception handling through structured reporting and standardized email notifications. This has improved internal communication and reduced ambiguity in the resolution of invoice discrepancies.

Although exact figures on error reduction were not formally recorded during the pilot phase, anecdotal observations suggest fewer issues with misallocated costs and missing surcharges. The bot's consistent application of matching rules and discrepancy reporting likely contributed to this improvement.

Overall, the evaluation confirms that the RPA solution delivered measurable benefits in line with the model's predictions. The time and productivity improvements validate the practical utility of the model and reinforce the potential for small-scale automation initiatives to produce meaningful efficiency gains, even in resource-constrained environments such as SME freight forwarding.

In addition to efficiency gains, the implementation was evaluated in terms of cost-effectiveness. As shown in Table 3, the RPA solution incurs a recurring license fee of €15 per month. The cost-benefit comparison highlights the economic advantage of the automation initiative, particularly when considering that the RPA now handles the majority of the process with minimal oversight. These findings reinforce the model's assumption that lightweight RPA solutions can yield not only operational improvements but also financial efficiencies in small-scale logistics settings.

Metric	Before RPA	After RPA
Monthly Processing Time	12 Hours	3,33 Hours
Average Time per Invoice	100 - 150 minutes	1 minute
Implementation Effort (one-time)	N/A	13 hours
Estimated Time Savings	N/A	72%
Estimated Per-Invoice Efficiency Gain	N/A	99%
Ongoing RPA License Fee	N/A	€15/month

Table 3 RPA quantitative comparison

5.6 Summary

This chapter presented the evaluation of the research, in which the revised RPA Outcome and Benefit Prediction Model was applied and evaluated in a real-world case setting. The case study focused on a micro-sized freight forwarding company operating in the European logistics sector. A repetitive invoicing process was selected for automation based on informal practitioner insights and validated using established RPA suitability criteria.

The RPA solution was designed to automate key process steps, including data extraction, discrepancy detection, and exception reporting. Its design was closely aligned with the predictive model introduced in Chapter 4, ensuring a direct connection between expected benefits and implemented

functionality. The implementation yielded substantial improvements, including a 72 percent reduction in total weekly processing time and 99 percent reduction in time per invoice. These results confirmed the predictive validity of the model within the targeted SME logistics context.

The evaluation further demonstrated that the RPA solution contributed to measurable gains in operational consistency, productivity, and internal communication. The solution was achieved within a timeframe of 13 hours and has a monthly licensing fee of €15 per month.

This case study illustrates how RPA can be successfully leveraged by small-scale freight forwarding companies to optimize operational workflows. The findings suggest that targeted automation within financial and administrative processes can improve accuracy, reduce inefficiencies, and enhance overall process reliability. More broadly, the results highlight the potential for RPA to serve as a strategic enabler for small logistics firms seeking to modernize their operations without requiring large-scale system overhauls. The outcomes support the utility of the predictive model as both a design guide and a post-implementation evaluation tool for lightweight automation in resource-constrained environments.

6. Conclusion

This chapter provides the conclusion of the research and reflects on its theoretical, practical, and methodological contributions. Section 6.1 summarizes the main results and findings in relation to the research question. Section 6.2 outlines the theoretical implications of the study, including its contribution to RPA literature in the SME logistics context. Section 6.3 presents the practical implications for organizations considering RPA adoption. Section 6.4 discusses the limitations of the research, and Section 6.5 offers directions for future academic work in the field of RPA implementation in freight forwarding.

6.1 Main Results and Findings

This thesis presents a RPA Outcome and Benefit Prediction Model. The initial model is based on a SLR. Five experts verified the model and suggested model enhancements. The revised model was used and evaluated in a case study. The findings of the case study provide valuable insights into the main research question, which seeks to determine how small and medium-sized freight forwarders can leverage an RPA outcome benefit prediction model to assess the feasibility of RPA projects. The implementation of RPA in the invoice management workflow of a small freight forwarding company serves as an empirical demonstration of how automation can enhance operational efficiency, reduce human error, and streamline financial workflows. These outcomes directly contribute to understanding how a predictive model can be designed to assess the viability of RPA initiatives in similar SME-scale logistics firms.

One of the key considerations in the main research question is the feasibility of RPA projects, particularly for smaller freight forwarders that operate with limited financial and technological resources. The case study illustrates that manual invoice processing posed significant inefficiencies, requiring extensive human intervention for verification and correction of errors. Before implementation, the invoice process consumed approximately 180 minutes of manual processing per week. After automation, the total time required for this workflow was reduced to 50 minutes per week, representing a time savings of approximately 72 percent. At the task level, the average processing time per invoice was reduced from 100 to 130 minutes to approximately one minute per invoice a 99.2 percent efficiency improvement. These results illustrate that RPA can generate significant gains with low overhead. Furthermore, the benefit is amplified by the fact that the automation runs as a background process, eliminating the need for direct user engagement in routine tasks. These empirical observations confirm that for SME-scale freight forwarders, RPA has the potential to optimize workflows with a measurable return on investment, making it an attractive solution for businesses with constrained operational capacity.

In addressing the feasibility of RPA implementation, the research question requires an understanding of how an RPA outcome benefit prediction model can systematically evaluate the potential impact of automation before deployment. The case study highlights several quantifiable metrics that serve as key indicators of feasibility, including processing time reduction, error minimization, and improved cost allocation accuracy. These factors provide a structured basis for developing a predictive model that assesses whether automation will yield sufficient benefits to justify investment in an SME context. By incorporating real-world performance data into a prediction model, freight forwarders can estimate the effectiveness of RPA before implementation, thus mitigating financial and operational risks.

Furthermore, the case study emphasizes the need for a structured framework that accounts for sector-specific constraints, particularly in logistics, where system integration and adaptability are crucial challenges. The experience of the company in automating invoice processing underscores the importance of ensuring compatibility between RPA systems and existing operational workflows. This

insight suggests that an effective RPA benefit prediction model must include an evaluation of technological readiness and system integration feasibility, ensuring that automation can be seamlessly incorporated into existing logistics operations.

Beyond feasibility assessment, the case study also provides an empirical foundation for understanding the broader strategic implications of RPA adoption for SMEs. The findings suggest that while automation can significantly enhance efficiency, its success depends on how well the technology is aligned with organizational needs and workforce adaptation strategies. These considerations reinforce the necessity of incorporating change management and employee engagement metrics into an RPA benefit prediction model, as workforce buy-in is often a determining factor in the long-term success of automation initiatives.

In conclusion, the case study serves as a practical validation of the core components necessary for an RPA outcome benefit prediction model. It demonstrates that for SME-scale freight forwarders, RPA can be a viable solution when applied to repetitive, time-intensive tasks such as invoice processing. However, feasibility assessment must go beyond theoretical advantages to include quantifiable impact measures, integration challenges, and organizational readiness. These insights directly contribute to addressing the research question by informing the development of a structured model that enables freight forwarders to systematically predict, evaluate, and optimize the benefits of RPA implementation before committing to full-scale adoption.

6.2 Theoretical implications

The study contributes to the academic literature on RPA by addressing a research gap in the application of automation within SME freight forwarders. Existing literature predominantly focuses on large enterprises with significant technological and financial resources, leaving the question of scalability and feasibility for SMEs largely unexplored. By proposing an RPA outcome benefit prediction model, this research advances theoretical understanding by offering a structured approach for SMEs to assess the potential impact of automation before committing to implementation.

The research questions that are outlined in this study guide its theoretical contributions. Firstly, by evaluating what is already known about RPA benefit prediction, the study consolidates insights from prior literature and empirical findings, providing a refined understanding of how RPA benefits can be systematically forecasted. This synthesis contributes to theoretical frameworks on digital transformation by establishing a clearer linkage between automation benefits and decision-making processes in logistics SMEs.

A theoretical advancement arises from the development of a model that encapsulates these benefits in a structured framework. Existing models of RPA benefit prediction often focus on either financial or operational outcomes in isolation. This research expands the scope by incorporating multiple dimensions, including operational efficiency, cost reductions, error minimization, and workforce implications. The proposed model serves as a starting point for future theoretical exploration of how predictive frameworks can enhance decision-making in SME-scale automation.

Furthermore, the research addresses the applicability of the model in a case study, demonstrating its practical validation in a real-world setting. This empirical application strengthens theoretical discourse by providing evidence-based support for the model's utility. It also identifies variables influencing automation success, such as process suitability, workforce adaptation, and system integration.

By examining how well the model predicted outcomes, the study highlights the strengths and limitations of predictive modelling in RPA adoption. The findings suggest that while the model effectively forecasts efficiency gains and cost savings, certain external variables, such as workforce

resistance and system compatibility, remain challenging to predict. This insight contributes to the debate on the adaptability and precision of automation forecasting models.

The research further extends theoretical knowledge by assessing how RPA can add value to SMEs beyond cost savings. While previous studies emphasize financial returns, this research broadens the discussion by exploring the qualitative benefits of RPA, such as improved compliance, streamlined data management, and enhanced strategic decision-making. These insights contribute to the evolving conceptualization of RPA as not merely an efficiency tool but a strategic enabler of business transformation.

Additionally, the study identifies which processes are most suitable for RPA in the SME freight forwarding sector. This contribution refines theoretical models of automation by emphasizing that process selection is contingent upon factors such as data standardization, rule-based structure, and integration potential. The findings align with and extend existing theories on automation readiness, reinforcing the idea that not all business processes are equally viable for RPA.

Finally, the study engages with the shortcomings of RPA, critically evaluating its limitations within SMEs. This research highlights constraints, such as technological dependency, change management challenges, and the need for continuous monitoring. By integrating these considerations into the proposed model, the research contributes to a more balanced and nuanced theoretical understanding of RPA adoption.

In conclusion, this study advances the theoretical landscape of RPA adoption in SMEs by providing an empirically validated prediction model, refining existing digital transformation theories, and expanding the discourse on automation feasibility, benefits, and limitations. These contributions serve as a foundation for future academic inquiries into the scalability and strategic impact of RPA within SME logistics enterprises.

6.3 Practical contributions

From a practical standpoint, this research offers valuable insights for business leaders considering RPA adoption in freight forwarding. The findings demonstrate that small logistics companies can achieve significant operational efficiency gains by automating repetitive tasks. The case study serves as a roadmap for other SMEs looking to implement similar solutions.

Moreover, the research emphasizes the importance of selecting the right processes for automation. Not all tasks are suitable for RPA, and careful assessment is necessary to ensure automation delivers tangible benefits. Companies should conduct feasibility studies before implementation to identify high-impact areas.

Another key takeaway is the need for effective change management. Resistance to automation is a common barrier, and businesses must prioritize employee engagement, training, and communication to ensure a smooth transition. Organizations that proactively address workforce concerns are more likely to see successful RPA adoption.

Finally, the study underscores the potential for integrating RPA with other digital technologies. Businesses should explore combining automation with AI, data analytics, and cloud-based solutions to further enhance efficiency and decision-making capabilities. This integration can lead to more resilient and agile supply chain operations, providing a competitive edge in the logistics industry.

6.4 Limitations

A critical evaluation of the research findings reveals both strengths and limitations in the study's methodology and outcomes. While the research successfully demonstrated the potential of RPA in

optimizing invoice processing workflows in small freight forwarding enterprises, several aspects warrant further discussion.

Firstly, the reliance on a single case study, though beneficial in providing detailed insights, limits the generalizability of the findings. The impact of RPA may vary depending on company size, operational complexity, and technological infrastructure. Future research should explore multiple case studies to provide a more comprehensive understanding of RPA implementation across different organizations

Another limitation concerns the scope of the automation process studied. The research primarily focused on invoice processing, which is a structured, rule-based task. However, many logistics operations involve more dynamic and complex decision-making processes that require cognitive automation. Investigating how RPA integrates with artificial intelligence or machine learning could provide a more nuanced understanding of automation's broader capabilities in freight forwarding.

Furthermore, the research acknowledges that human factors play a significant role in the success of RPA adoption. Employee resistance, lack of technical skills, and change management challenges must be addressed to facilitate smoother implementation. Future studies should examine strategies for organizational adaptation to automation, including training programs, job redesign, and cultural shifts toward automation acceptance.

The absence of a structured feedback mechanism in the existing model was identified as a limitation, as it fails to account for the iterative nature of automation adoption. This necessitates the inclusion of a post-implementation evaluation phase, wherein organizations can systematically assess the effectiveness of RPA applications and make necessary adjustments to optimize performance. Without this feedback loop, organizations may struggle to ensure that automation solutions remain aligned with evolving business needs and operational demands

Additionally, the proposed model does not explicitly address organizational culture and employee adaptation. This suggests a need to incorporate a structured approach to change management, ensuring that automation is positioned as an enhancement rather than a replacement for human labor. A failure to consider the human element in automation adoption can lead to increased resistance among employees and may hinder the full realization of automation benefits. Future research should explore frameworks for integrating RPA into workplace cultures in a way that fosters acceptance and facilitates workforce transition.

Economic conditions also play a significant role in the implementation and scaling of RPA solutions. In periods of economic expansion, RPA can facilitate innovation by reallocating resources toward strategic initiatives. Conversely, during times of financial constraint, automation is often leveraged as a cost-cutting measure, leading to workforce reductions. The current model does not account for these macroeconomic considerations, suggesting the need for a more flexible framework that acknowledges the dual role of automation in both fostering innovation and enabling cost efficiencies. Future research should explore how economic cycles influence the decision-making process for RPA investment and its long-term sustainability.

Finally, while the study highlights efficiency gains, it does not deeply analyze the financial return on investment (ROI) over an extended period. Longitudinal studies assessing the economic sustainability of RPA, including maintenance costs and evolving business needs, would contribute to a more holistic evaluation of automation's impact. Further investigation into the comparative cost-benefit analysis of RPA versus traditional process management approaches would also enhance understanding of its long-term viability for SMEs in the freight forwarding sector.

6.5 Future Research

Further academic research in the field of RPA implementation in freight forwarding is necessary to explore several dimensions that remain underdeveloped in the literature. One area that warrants further investigation is the scalability of RPA solutions within SMEs. While this pilot project has demonstrated efficiency gains, the extent to which RPA can be expanded across multiple processes within an organization remains unclear. Research is needed to assess the challenges associated with scaling automation solutions, including infrastructure requirements, integration with existing enterprise systems, and the financial feasibility of larger-scale implementations.

Another avenue for future study is the long-term cost-benefit analysis of RPA adoption in SMEs. While initial implementations often result in reduced manual workload and improved accuracy, there is limited empirical evidence on whether these benefits sustain over time. Further research is needed to determine whether the financial investment in RPA yields continued operational advantages or whether diminishing returns emerge due to maintenance costs, software updates, and evolving business needs.

The intersection of RPA with artificial intelligence and machine learning represents another crucial area for further inquiry. Current implementations of RPA primarily focus on rule-based automation, yet the integration of AI-driven decision-making capabilities could significantly enhance automation potential. Studies are needed to investigate how AI-enhanced RPA can handle more complex tasks, such as predictive analytics in freight forwarding, adaptive error handling, and intelligent data extraction from unstructured sources.

Additionally, the evolving role of human workers in RPA-enabled environments should be examined. The transition to automation fundamentally alters workforce dynamics, raising questions about job redesign, skill development, and employee adaptation. Research should explore how SMEs can facilitate a smooth transition for their workforce by providing adequate training, redefining job roles, and fostering collaboration between human workers and automation tools.

Lastly, further studies should address the regulatory and compliance implications of RPA in freight forwarding. Given the stringent documentation and regulatory requirements within the logistics sector, it remains unclear how automation affects compliance with industry standards. Research is needed to assess whether RPA implementations align with legal obligations and whether automation can help businesses mitigate regulatory risks more effectively.

By addressing these research gaps, scholars can contribute to a more comprehensive understanding of the potential and limitations of RPA in the freight forwarding industry, ultimately guiding businesses in making informed decisions regarding automation adoption and optimization.

Appendices

Appendix A: PRISMA Item Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	

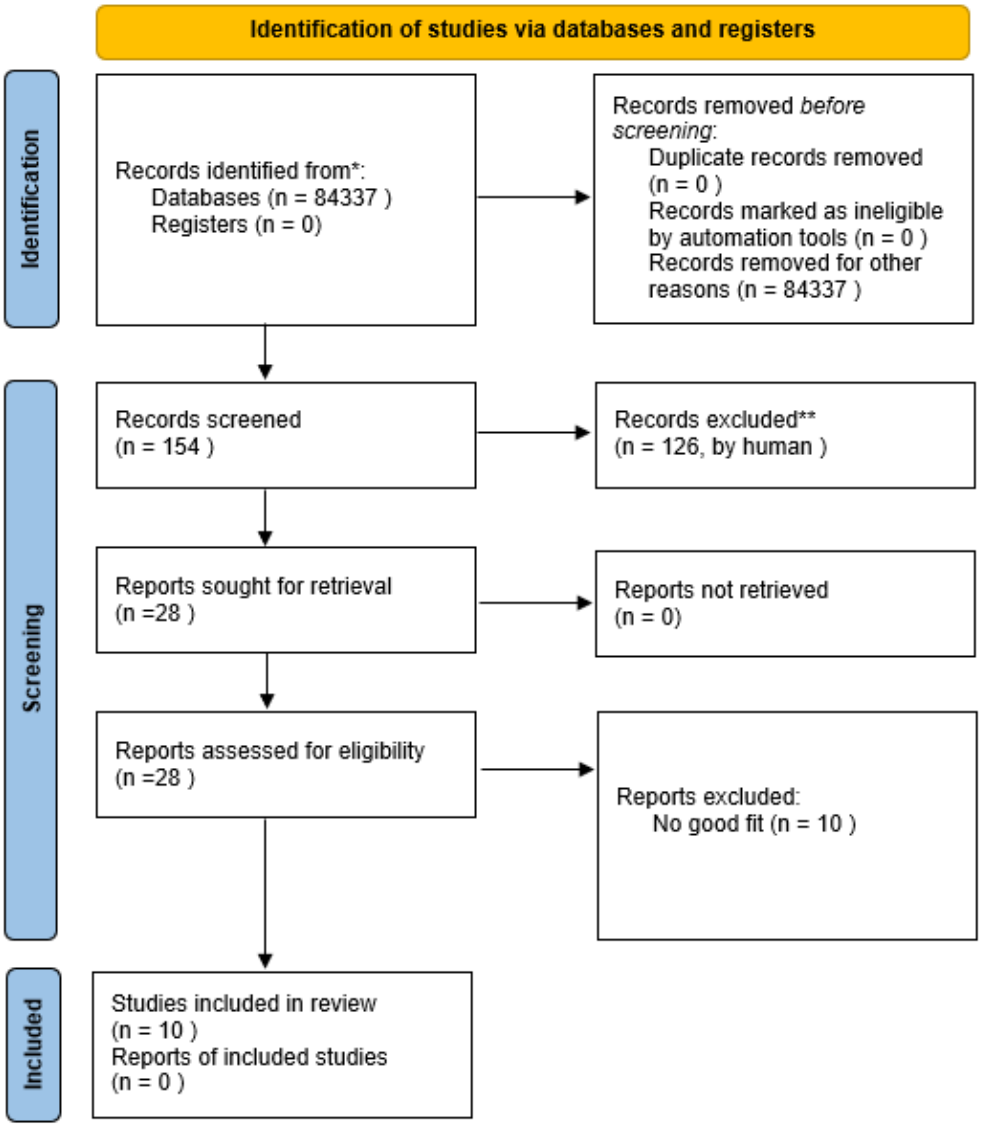
Section and Topic	Item #	Checklist item	Location where item is reported
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	

Section and Topic	Item #	Checklist item	Location where item is reported
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix B: PRISMA Flowchart

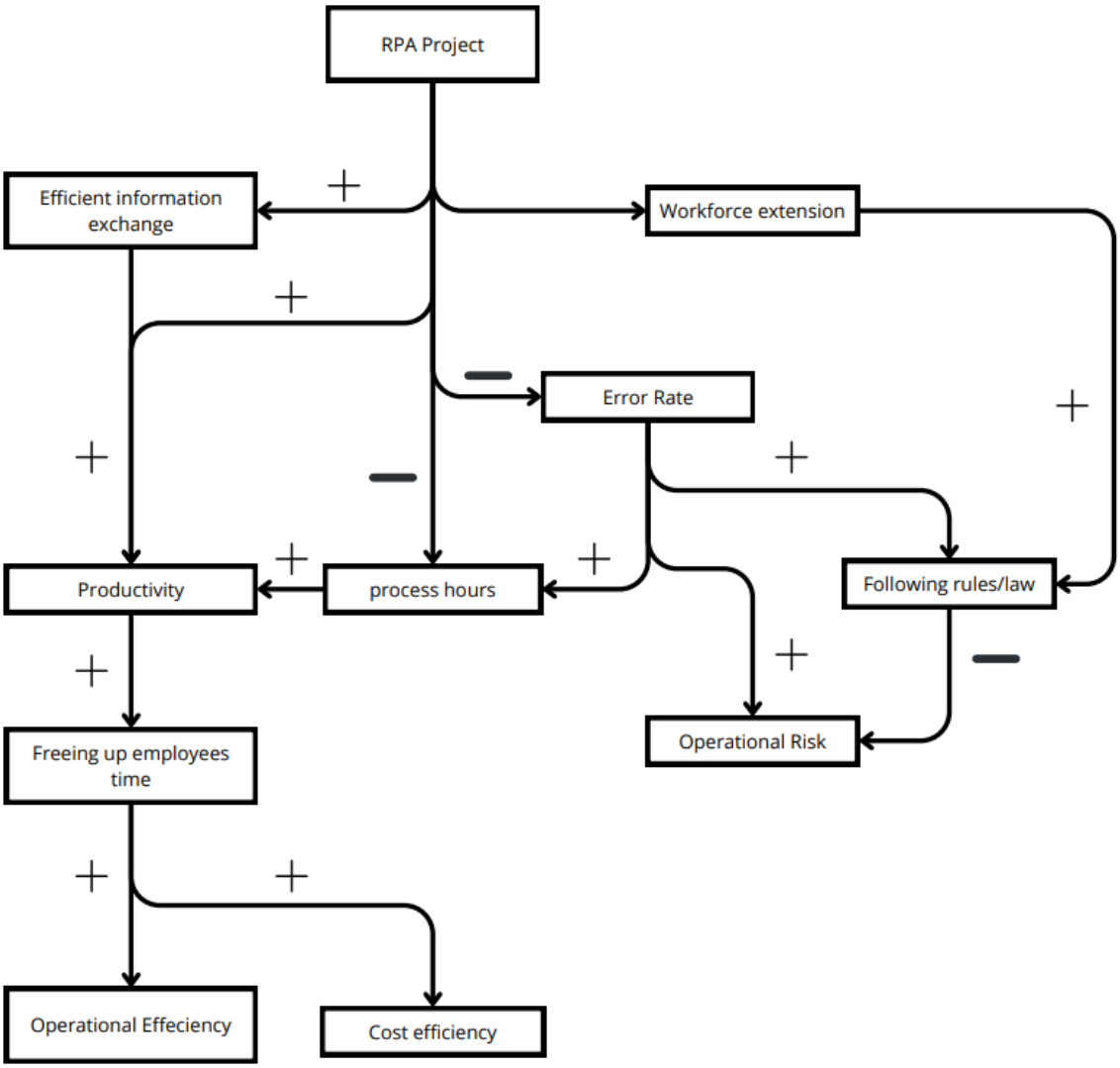


Appendix C: Results Literature review Plattfaut and Borghoff (2022)

Findings for the Advantages of RPA

	General Automation Effects			RPA Specific Advantages		
Reference	Productivity Increase	Reduced Error Susceptibility	Conformity and Traceability	Non-Invasiveness	Ease of Use	Extent Automation Scope
(Aguirre and Rodriguez 2017)	X					
(Almutairi and Nobanee 2020)		X				
(Alt 2018)	X					
(Ansari, Diya, S. Patil, and S. Patil 2019)					X	
(Bosco et al. 2019)					X	
(Cewe et al. 2018)					X	
(Cho et al. 2020)	X					
(Cho et al. 2019)	X			X		
(Choo 2018)	X	X				
(Cooper et al. 2019)	X				X	
(Denagama Vitharanage et al. 2020)	X	X		X	X	
(Dietzmann et al. 2020)		X	X			
(Fernandez and Aman 2018)					X	
(Fischer et al. 2020)						X
(Gami, Jetly, Mehta, and Patil 2019)	X					
(Guhathakurta 2018)	X					
(Hallikainen et al. 2018)				X	X	
(Hofmann et al. 2020)			X		X	
(Ivančić et al. 2019)				X		
(Koch et al. 2020)					X	
(Kokina and Blanchette 2019)	X					
(Kokina et al. 2019)	X					
(Lacity and Willcocks 2015)				X		
(Lacity and Willcocks 2016)				X	X	
(Lacity et al. 2016)	X					
(Mendling et al. 2018)	X	X		X		
(Nawaz 2019)	X					
(Nili et al. 2019)		X				
(Penttinen et al. 2018)				X	X	X
(Polak, Nelischer, Guo, and Robertson 2020)	X					
(Schmitz et al. 2019)	X	X				
(Schuler and Gehring 2018)				X	X	
(Siau et al. 2018)	X					
(Tarafdar and Beath 2018)	X				X	
(Urbach et al. 2019)	X					
(van der Aalst et al. 2018b)	X					X
(Vishnu et al. 2017)					X	
(Zasada 2019)	X					X

Appendix D: First iteration RPA Outcome and Benefit Prediction Model



Appendix E: RPA-Model explanation for interviewee

English:

This document outlines a framework for the implementation of Robotic Process Automation (RPA), focusing on its interconnected impacts on organizational processes, workforce efficiency, and overall performance. The flowchart provided illustrates how automation can serve as a foundational tool for driving productivity, cost savings, and compliance, while also supporting long-term operational goals.

At the core of the framework is the role of RPA in automating repetitive, rule-based tasks. This shift enables employees to allocate their time to more complex and strategic activities, reducing the reliance on manual processes. This reallocation of efforts enhances overall productivity, as tasks are completed more efficiently and with greater accuracy. The automation of these processes contributes to reducing operational delays and errors, which are common in manual workflows.

The flowchart highlights a direct link between RPA-driven automation and cost efficiency. By reducing the need for extensive manual labor and lowering the likelihood of costly errors, organizations can achieve measurable financial savings. These savings are not just a byproduct of efficiency but can also be reinvested into other strategic areas, enabling the organization to adapt and innovate more effectively.

A notable feature of the framework is the concept of "workforce extension." RPA functions as a digital workforce, complementing human employees by handling high-volume, repetitive tasks. This not only increases the capacity to manage workloads but also allows organizations to scale operations without proportionally increasing headcount. This balance of human and digital labor ensures that resources are optimized while maintaining flexibility to address fluctuating demands.

Another important aspect of the framework is the improvement of information exchange across systems and departments. By automating data processing and communication, RPA reduces inefficiencies and ensures a seamless flow of information. This enhanced connectivity supports collaboration and decision-making within the organization.

The reduction of error rates and process times plays a significant role in improving operational efficiency, as depicted in the flowchart. Automation ensures consistent adherence to predefined rules, which minimizes mistakes and increases reliability. This precision also supports compliance with legal and regulatory requirements, reducing the risks associated with non-compliance.

Operational efficiency, as a central element of the flowchart, ties together the benefits of RPA. Fewer errors and faster task completion lead to improved reliability and output, which in turn helps mitigate risks associated with inconsistent performance or external regulatory scrutiny. By fostering a systemized approach, RPA provides the tools to address these challenges while maintaining flexibility to adapt to new opportunities or challenges.

The framework presented emphasizes how RPA can serve as a strategic enabler rather than just a cost-cutting measure. The interconnections outlined in the flowchart suggest that automation has the potential to transform workflows, enhance productivity, and support sustainable growth. By integrating RPA into its operations, an organization can position itself to be more efficient, responsive, and competitive in a rapidly evolving business landscape.

Appendix F: Interview Guideline

Academic Interview Guideline for Semi-Structured Open Interview on RPA Benefit Model

Introduction

Self-Introduction:

- Briefly introduce yourself, your role, and your research background.
  Ask for verbal consent for recording and state that transcripts will be provided for review and approval.
  State that transcript will be anonymised.

Interviewee Introduction:

- Ask the interviewee to introduce themselves, including their professional background, role, and experience in the field.

Research Purpose:

- Explain the objective of your research, emphasizing the investigation of Robotic Process Automation (RPA) benefits and how the interviewee's insights will contribute to refining the RPA benefit model.

Model Walkthrough

Present the RPA Benefit Model:

- Briefly describe the model, highlighting the key variables (e.g., cost savings, productivity gains, error reduction, etc.) and how they interact.
- Walk through each component of the model and explain the expected contributions of each factor.

Main Interview Questions

Model Coherence with Literature: 5. **Literature Alignment:**

- “Based on your experience, how does the model align with the current literature on RPA benefits?”
- “Are there any aspects of the model that you believe are consistent with widely accepted findings?”

Real-world Anomalies: 6. **Differences from Reality:**

- “Does the model accurately reflect what you have observed in practice?”
- “Have you encountered scenarios where the predicted benefits or variables in the model differ significantly from real-world outcomes?”

Impact on Workforce Dynamics:

- "How do you think the model addresses the impact of RPA on workforce dynamics, particularly in terms of reskilling or job displacement?"

Scalability and Long-term Benefits:

- "In your experience, how well does the model account for the scalability of RPA projects and their long-term sustainability?"

Industry-Specific Considerations:

- "Are there any industry-specific factors that might alter how this model applies to certain sectors?"

Quantifying Intangible Benefits:

- "How do you think the model could be adjusted to better capture intangible benefits like employee satisfaction or innovation potential?"

Experience-Based Adjustments:

- "What specific adjustments or changes would you make to the model based on your own professional experience?"
- "Are there any variables or factors that you believe are missing or over/under-represented?"

Additional Questions

General Feedback:

- "Do you think this model captures the complexities of RPA implementation, or are there areas where it could be simplified or expanded?"

Unanticipated Implications:

- "What potential implications, positive or negative, might arise from using a model like this to predict the benefits of an RPA project?"

Final Thoughts:

- "Is there anything else you would like to add or any additional comments on how this model could better represent RPA's benefits?"

Closing

Wrap-Up:

- Thank the interviewee for their time and valuable insights.
- Inform them about the next steps in your research and how their contributions will be incorporated.
- How would you score the model on a scale of 1 to 10?

Appendix G: Transcript expert interview 1

00:00:01 Speaker A

Good morning, we're here for an interview for my master's thesis, David Ostroga. A short part of the research here is that we're doing research into RPA, Robotic Process Automation, and especially the benefits that come with it. In front of you, you see a proposed model based on literature research. And the goal of this in-depth interview is really to gather more practical experience and knowledge so that the model can be improved or refined where needed.

I'd also like to mention, of course, that everything is treated confidentially, nothing will be shared with third parties or commercial entities or anything like that. And in accordance with the university's regulations. A transcript will be made of this, and the data will be processed anonymously. Well, with that said I'd like to begin the interview, and that can be with a short introduction about yourself, really.

Who are you?

What do you do?

What is your professional background and experience?

00:01:05 Speaker B

I'm XXXXXXXX, owner of XXXXXXX. We've been doing this since 2019, so just over five years now, where we actually saw opportunities in accountancy to automate and digitize more, and made that a real focus. And we're working on that full-on. Before that I already had years of experience in accountancy.

In addition, we also started 2.0 automation, where we basically support other accountancy firms with their automation processes.

00:01:49 Speaker A

Good to hear. You've already seen the model before the interview and read through what it all involves. So the first question is really, since you're already involved in this yourself, how does this model align with other literature sources and the benefits of this type of automation process and your experience?

00:02:11 Speaker B

Yeah, extremely useful. I think that... I see this kind of thing more and more, of course. Also with the rise of AI, this has become very relevant. And you just notice that robotization, automation of processes, and especially in our field, can have a lot of benefits.

00:02:33 Speaker A

Yeah. Are there aspects in this model that are consistent with broadly accepted findings?

00:02:40 Speaker B

Yeah, do you mean whether this is also applicable here or more...

00:02:45 Speaker A

Yeah, within your field indeed.

00:02:47 Speaker B

Yeah, definitely, definitely.

00:02:48 Speaker A

Not necessarily to critique it, but there are also a few validating questions in the interview. It's not just what's wrong, but also what definitely matches.

00:02:57 Speaker B

No, but for sure, that's right. Because if you look, and if you also take the description with the model, then you also just see, and that's also where we need to go, also in our field, that you also work with less susceptibility to errors. And that can be fairly easily automated. Also within our organization.

Which makes the process flow much more smoothly through the organization. And employees consistently deliver good work. And also, which is nicely considered in the model, is that we deal with a lot of regulation, laws and regulations in our field.

That's very important. We do have to comply with certain guidelines. And yeah, you mention that very well in this process. But okay, those rules apply to everyone, so to every employee. And if you can put that into a process that gets everyone aligned, then that's really useful.

00:03:57 Speaker A

Then on differences with reality, does the model also correspond with what you experience in practice?

00:04:05 Speaker B

Not yet actually, not yet. I do have to say we're working more and more on it. Over the past months we've really been looking around, we've had some talks with certain parties that are very focused on robotization, on AI, to see how we can, yeah, within our field, take repetitive work that looks a lot alike and improve it, simplify it, get it through the organization more efficiently, so that people spend less time and can be more productive for their clients.

Which at the moment is still applied too minimally in our field, because it's actually quite complex to even introduce something into an organization.

00:04:55 Speaker A

Is that also a bit due to gaps or constant changes in legislation?

00:05:01 Speaker B

Yeah, that too of course. You can automate a lot of processes. You just have to get the people in the organization on board, that they can also go along in those processes. But indeed, because you're also hitting on a good point here. We have to deal with a lot of decisions from the government. And those change every year, of course. But those rules, even if they change, they can still be laid down somewhere. And if they are, then they can be taken into account in the robotization process. So as soon as you have your back office on laws and regulations well organized, that doesn't have to have a dramatic impact on your processes in the organization, because it's already applied.

00:05:52 Speaker A

Do you maybe also have concrete examples or situations where the predicted benefits or variables in the model deviated significantly from the outcome?

00:06:03 Speaker B

Negatively you mean?

00:06:04 Speaker A

Yeah

00:06:05 Speaker B

Well, yeah, that's maybe... It's perhaps still underused, but I'm really working on it. I'm in the exploratory phase for example with Microsoft Copilot. I don't know if you know it. You probably do. Where you also notice, and I'm mainly working on it myself right now, to see what the benefit would be of rolling something like that out in an organization.

What are the pros and cons? You could save a lot of time responding to an email for instance. But you also notice that sometimes such an email makes no sense at all. So it's really a question of when is the right time to roll out certain processes in the organization. Because on one hand it has to bring you benefits, time savings, but on the other hand it mustn't disrupt the process.

And that's kind of what I'm in the middle of right now, what works well and what still doesn't at this point.

00:07:03 Speaker A

To summarize that a bit, indeed, that's then a part of the reduction of errors. That might not come through immediately in the beginning of course, because it's still in the startup phase. And you get two parallel process flows. On one side everything that's already running has to keep running. And on the other side, you're building new processes

00:07:22 Speaker B

Yeah, I'm keeping track of that too, where is it going wrong, where can I... indeed your error rate, where does that come from? And that links nicely to legislation of course. What is allowed, what is not. What is accepted, what's been verified, is the information I get actually correct.

Yeah, that's really important. And that's also part of why I want to roll things out within the organization. But only when it's been well tested, and that the error rate is actually minimized.

00:07:59 Speaker A

How do you think the model handles the impact of RPA on work dynamics? Especially regarding reskilling or job loss of course, because in practice everywhere people say: employees become more productive, or we're going to work more efficiently. Then people quickly think, my job is going to disappear

00:08:17 Speaker B

Well, I'm not so worried about that. I'm more inclined to look at what you can do. I hear that a lot, more and more. That the rise of AI makes people a bit scared. And they think, what's going to happen to my job? But I don't think you should think like that, because that's actually always been the case.

I mean, you used to have a blacksmith on every street corner, but you don't anymore. That's just a changing economy. And that's been going on for years. And when these kinds of things come up, you really have to look at the advantages you can gain.

And for example, if we're going to use an RPA within our organization, we gain a lot more time to advise our clients. To sit down with them, to reconnect, and to really mean something more for that client from that perspective.

00:09:09 Speaker A

So actually a bit of an unexpected split: by automating a lot, you actually get more time for the client, together with you and your employee.

00:09:17 Speaker B

Which allows you to give more advice, help the client more specifically, and yeah, I do believe there are opportunities there.

Because if you look, for example, often a financial statement is very important ,or at least, that's what it is. It's about accounting for the previous year. But well, if you look at twenty years ago, when I started in this field, you'd maybe spend two weeks putting together the financial statement, gathering everything, all the tasks involved.

By now that process is so much easier because of automating and robotizing certain steps, that it no longer takes nearly as much time.

Speaker A

Could you make that more concrete?

00:10:04 Speaker B

There was a hospitality business. Doing all the bookings manually. When I had just started in accountancy, you still had to do the whole financial statement by hand. You had to type everything out. I think that's gone from two weeks to one day, maybe one and a half. Those tasks have just gotten easier in that area, because it all runs faster.

00:10:38 Speaker A

Do you think that with the rise of RPA and similar tools, it'll be reduced even further?

00:10:40 Speaker B

I think so, yeah. A simple example: if you look at our financial statement with the compilation report, there's quite a bit of text in there. And those texts refer to the figures. You might have commercial principles in the statement, or tax principles.

Well, I won't go too deep into what the difference is. But a tool like this could check: is the financial statement correct? Are all principles actually based on what you wanted to express in the original file? What we still do now is: when you have a financial statement, you read it completely, integrally.

Does everything add up? Is what's on page 20 consistent with what we said on page 5? And if at some point you can automate that whole document, that saves a lot of time. So I definitely believe there's still efficiency to gain. And the error rate will get lower and lower of course.

00:11:46 Speaker A

I can already tell this is definitely a key area for your field.

00:11:50 Speaker B

Yeah, well, that susceptibility to error is really important, yeah ,because if something gets released…

00:12:01 Speaker A

The scalability of this model. To what extent does the model account for the scalability of RPA projects and their sustainability in the long term? Could this be applied to one specific individual project, or is it more applicable at an abstract strategic level?

00:12:18 Speaker B

I think a bit of both. I think if you're working within a project, and then I'm talking about the year-end work someone is doing, that you've got tools that can help, can speed up the process. But I also think organization-wide. If you're working on a year-end report, then you're working for a specific client.

There you can also take into account laws and regulations, but also things like the type of client. What's going on with that client? What matters to them right now? But it could also be a model where you, for example, have a general question with the tax office or about correspondence with the tax office, just saying, you could... You could throw the tax office database behind it, and that it becomes like a knowledge base that can give you the right answer, or even generate an advice letter.

00:13:09 Speaker A

Kind of like a wetten.nl chatbot, simply put.

00:13:11 Speaker B

Yeah, for example. And then it works across the whole organization. Everyone could use it. Everyone gets questions from clients where you think, okay, how was that again, how do I... we all want to have that info available. But also within a project, say you're working with a car company, then you also know what kind of legislation you're dealing with in that industry.

In that sector there are specific requirements you have to meet. And that would also become quickly clear with models like this, so you can ask the client the right questions. The questions that actually matter and need to be recorded, you know?

00:13:51 Speaker A

Then here it's indeed mainly emphasizing the efficient exchange of information and keeping the information database up-to-date. That that's really a scalable thing.

00:14:02 Speaker B

Yeah, exactly. And at a certain point, if you look at productivity, for example within a project, you can be much more productive. First, you free up time for projects, so as a firm you can also take on more. Like I said earlier, I used to work at an accountancy firm and I had lots of colleagues around me.

So then I was in a big office with people. And we still have people here of course. But I mean, what used to take two weeks, and now maybe a day, a day and a half, you can't even calculate anymore. That you can now do way more financial statements in the same amount of time than you could before.

So things have just gotten way more efficient overall.

00:14:42 Speaker A

We already touched on this a bit, but now we have the chance to make it explicit. Are there sector-specific factors that could influence the applicability of this model?

00:14:54 Speaker B

Yeah, loads. In our field of course loads. You've got all kinds of companies with typologies that also have to comply with laws and regulations. We deal with the tax authorities who want all kinds of things from us. We deal with the Chamber of Commerce. But really, there are so many institutions we have to account for.

And I think that's also part of the complexity of integrating RPA within our field. And on top of that, we work with, yeah, I counted recently,more than twenty software packages. And they also have to communicate with each other.

They are connected via APIs, which is great. But the next step would be that they understand each other, that they can complement each other.

00:15:46 Speaker A

A top layer that can communicate with everything.

00:15:50 Speaker B

A sort of helicopter view over everything that's in there.

00:15:52 Speaker A

And that's fundamentally RPA indeed.

00:15:55 Speaker B

Yeah, but I think we're slowly getting there. Just two years ago, some packages were still keeping their APIs closed. Just so they wouldn't give away too much information. And now you notice they're all opening the back door. Because, if we don't link up with other packages, then we'll price ourselves out of the market.

And that's the first step. Through those connections, through those APIs and communication with each other, you already get a lot of information to share across their work. And I think the next step is to really extract efficiency from that and simplify processes. I really do believe in that.

00:16:38 Speaker A

Okay, then a follow-up question: how could a model like this better address intangible benefits, such as employee satisfaction or innovation potential? Because those are also factors that came up in the literature review.

00:16:55 Speaker B

Yeah, if you're in accounting,the hardest part of the accounting profession is always, and maybe it's the same in other fields,is change. So people always find that very scary. And especially in accounting, because people are real creatures of habit in this field, you also notice that people cling to something.

They might have been doing something for two years already. Never really thought about, "Hey, could this be done differently?" That's kind of my role too, where I try to look more closely like, "Hey, why are you doing it like that? Why not do it another way?"

And yeah, we're very used to doing certain processes in accounting. It gets a bit grey sometimes. Change is sometimes quite complex for employees. But, yeah, if you approach it positively, if you say, "This is what we're going to do, and it only brings benefits,for you, for me, for everyone in the organization," then you can often bring them along.

That's basically step one. But of course, we also have another stakeholder, and that's our clients. And they also have to be willing to come along. And that's sometimes even more complex than within the organization itself. So we're dealing with multiple parties who have to keep up with the times. Yeah, exactly.

For example, I've got a client,this is a nice example,a client over 80.

And when he came in, when we started five years ago, Jeroen and I said, "Yeah, we're going to do things in a certain way." And if that doesn't fit with the client, we kind of had to say,although we don't really want to,we'd have to change our whole process.

If we start doing all kinds of different things. But I said, "I'll take care of it. That guy is going to go along. 80 or not, he's going to go along with the process."

And by now, he really does. So sometimes you just have to push through. But it does bring a certain complexity in getting those people on board.

00:18:50 Speaker A

So in that sense, maybe in the context of change management indeed,this kind of model could actually help internally, I just realized,to make clearer what we're doing and why and where we want to go. Which could indeed be supportive.

00:19:05 Speaker B

Yeah, I think so. I think,yeah, for me this process is very clear and if I read the texts with it, then yeah. But, okay, for HBO (college) thinking level this is probably easier to read. So you'll also have to translate it to the work floor,what is it that we actually want?

Why do we want that? This kind of process is very clear to me, but with this added, it might also be clearer to most people. Look, we have people with higher education and also people at MBO (vocational) level, for example,and you need to bring them along in those processes too. And explain: why does this need to happen? Why do we want it?

What's the benefit of it? And indeed, what you said earlier, people are maybe quick to be afraid,what's going to happen to my job? And that does play a role. Like, I may see the opportunities, but employees might just see threats.

Like, "If I do this, I'll be done faster, and then what?" That definitely plays a role. So if you want to translate something within the organization,but that's actually been the case in accounting for years. People naturally have a kind of resistance to anything that changes, because they're afraid their profession will disappear.

If you just look back at the old days of bookkeeping,every accountancy firm had a whole pool of bookkeepers. And now, with automation and robotization, that's become more and more efficient, it goes faster. So the job of bookkeeper itself will eventually disappear. You're moving more towards a controlling function within that field.

So no longer saying: this is the name of the company, this general ledger account needs to be booked. That's increasingly being handled better.

00:21:01 Speaker A

They are indeed small tasks that maybe take five minutes or two, sure. But you have to do them every day, day in day out, for a whole year.

00:21:10 Speaker B

Yeah, exactly.

00:21:11 Speaker A

That's kind of the idea indeed. We can ultimately account for all the savings. What specific adjustments or changes would you make to the model based on your own professional experience? So here's really the space where you can sketch things.

00:21:27 Speaker B

To actually sketch something? No, I get that. Well, what I would at least change,and this is maybe more because we're all Dutch,I'd make it Dutch. But I get that you're doing it in English.

Yeah, but that's more for our profession. We're all pretty Dutch-focused. But you do notice that the moment you talk to software suppliers, they're increasingly communicating with you in English.

00:21:53 Speaker A

I notice that myself too,just a side note,I can actually express myself better technically in English because of the courses I've taken, even when I'm talking to you in Dutch.

00:22:04 Speaker B

Yeah, well, just to highlight that.

00:22:06 Speaker A

What's the equivalent of that, indeed.

00:22:08 Speaker B

You also notice that more and more subjects,especially in the IT field,are now taught entirely in English. That's no longer in Dutch. Only accounting is still mostly taught in Dutch.

What would I change? Not much. The only thing I might be missing in this model is maybe the feedback from usage within the organization.

You know what I mean? You do go to the error rate and all that, but what I might be missing is feedback from the organization, from the client, from the software, the error rate,but what is that feedback, and what do you then do with it?

What changes do you implement afterward to make sure that error doesn't happen again. That you first get a bit of feedback within the organization, from clients, from software. Would that be a nice addition? I don't know.

00:23:07 Speaker A

I'm thinking about that too, actually. My first feeling is that it might just fall outside the scope of the model. I'd basically be getting a self-correcting system, whereas this model is mostly about mapping out benefits and how those all connect.

00:23:26 Speaker B

You're right about that.

00:23:29 Speaker A

I absolutely want to emphasize that it's very relevant, of course, that feedback loops are built in again.

00:23:36 Speaker B

Yeah, but then you can also measure,look, you're talking about process hours, you're talking about productivity, you're talking about freeing up employees' time,yeah, that's also quantitative of course. You want to be able to measure that at some point too. We did this, but what does it actually look like? Did we actually save hours?

Did productivity improve? That's maybe just outside this model. But yeah, that might be a step too far for me. But I often think that kind of thing is great to work on too.

00:24:09 Speaker A

That's how research works,someone comes up with something, and someone else builds on it later.

00:24:13 Speaker B

Yeah, definitely, definitely. But apart from that, this process is very clear to me.

00:24:21 Speaker A

Are there any variables or factors that you find missing, or over- or underrepresented?

00:24:29 Speaker B

That I'm missing? Well, you know what I mentioned earlier? I don't know if I'm really missing it, but... You've got a box for "following rules and law." But you also have something like: following the possibilities within the software packages you gather around you. That plays a role too.

What's possible, what's not? Whether that really plays a role in processes like this, I'm not sure. Maybe that also falls just outside the model, but... You want to implement a model within the organization,but to what extent is that possible with the software landscape you have at the time? Do they all fit in?

Can they all be applied?

00:25:34 Speaker A

Do you think the model accurately reflects the complexity of RPA implementations? Or are there areas where it's oversimplified or could be expanded? Like, maybe combine or split blocks?

00:25:49 Speaker B

Kind of what I said earlier. For example, "following rules and law" is actually a continuous process, I think,one that should be applied across the entire model.

But I get that you're placing it here,from workforce level,where it's applied operationally.

00:26:24 Speaker A

I see here for example a block for "productivity" and one for "process hours." Does that really need to be split, or could you just make that one block: productivity?

00:26:36 Speaker B

For us, that's really one thing. How many hours you spend on something,that immediately affects productivity.

00:26:47 Speaker A

It's related indeed. By removing blocks the model becomes more digestible, but at the expense of some depth.

00:26:54 Speaker B

Yeah, and in the process you're at here, if you then add that bottom block,or put it just below it,"freeing up employees' time" is obviously a result of increased productivity and reduced process hours. That's already a time saver for the organization.

00:27:24 Speaker A

I'm leaning toward the conclusion that it does need to be reviewed, whether those two blocks really need to be called out explicitly. Because of course, if you take stuff out but the model stays just as clear, then it's better to remove it. But this is just the first version. It's basically everything the literature mentioned,at least what I found,just written down on paper. So you get the whole beast, and from there, interviews like this help to refine and adjust.

00:27:53 Speaker B

Yeah, and that's the beauty of it. And if you look,the whole efficiency part is sitting down at the bottom here. And not just in operational cost efficiency, but maybe also in other areas. It's really...

The RPA you bring in brings total efficiency with it. Across the whole organization,in time, in money, in satisfaction.

Basically everything that comes forward in such a process.

00:28:28 Speaker A

Is this model capable of identifying and/or analyzing the benefits of RPA projects?

00:28:39 Speaker B

How do you mean that question?

00:28:39 Speaker A

By using this model, does it become clear what the benefits of an RPA implementation are?

00:28:49 Speaker B

Yeah, to me it does. You do have to read a bit of the explanation with it. But okay, that's more to get a sense of where we're heading. It's very clear to me. Look, not everyone knows what RPA is. Luckily I do. But okay, the moment you spell out RPA as Robotic Process Automation, then you immediately get what's meant here.

Because that's the only abbreviation you see. But that's more because maybe it's less familiar in our field. But once you break that down and understand what it's about, then the whole process becomes clear too.

00:29:29 Speaker A

On a scale of 1 to 10, how would you rate this model in terms of usability as it stands now?

00:29:38 Speaker B

I think I'd give it a solid 8, if I may say so.

00:29:55 Speaker A

Then all that's left for me is to thank you for your time and valuable insights. Like we said at the beginning, I'll conduct two more interviews, and then comes the synthesis stage where I gather the views from my interviews.

That will basically lead to a revised 2.0 version of the model.

And then I'll apply that in a case study,so a kind of measurable quantification. I believe there are some processes that are actually implemented and that were predicted by literature and field experts.

00:30:36 Speaker B

Okay, great. You're welcome.

00:30:37 Speaker A

Yeah, thank you.

Appendix H: Transcript expert interview 2

00:00:03 Speaker A

Well, welcome. Let's first start with the formalities, with the consent for the interview. This interview is used for a graduation research, thesis, and everything will be anonymized and stored in accordance with practical regulations. The conversation is being recorded for research purposes. Do you agree with that everything will be anonymised Okay, great. Then we'll now begin with a short introduction about myself.

00:00:32 Speaker A

Well, I'm Dawid. I'm working on my research towards RPA projects and their benefits. Based on the literature, I've developed a model, and the goal of the interview is actually a bit of validation to see how well it holds up against reality. So now it's your turn for a short intro about yourself, who you are, what you do.

00:00:57 Speaker A

I'm XXXXXX. I'm Product Manager, Service Manager for XXXXX at XXXX. One of my core tasks is also keeping track of the rates and contracts we close with our customers. And for that, we also use robotization to speed up and simplify processes that involve a lot of manual work.

00:01:35 Speaker A

The research goal here is to investigate the benefits of RPA as a strategic tool within companies, and the insights from you from the field can help refine the RPA model. So that seems like a good first logical step to go through the model. You've already had a chance to read a one-pager beforehand.

This is also included further in the research in the appendix actually. And then we see how everything relates to each other. You've already read through it. Are there any first remarks, anything that stood out?

00:02:22 Speaker B

No, the flowchart, in principle, not really. It's fairly clear.

00:02:33 Speaker A

Okay, that's good. Have you yourself also, within this RPA framework, had experience from literature, like that you came into contact with the work yourself or had to figure out how one thing links to the other?

00:02:43 Speaker B

Do you mean how it works in the background? Or do you mean how it functions in practice?

00:02:53 Speaker A

The idea in the background, yeah, whether what I found in the literature matches your experiences in the field.

00:03:04 Speaker B

I haven't really seen that myself, cause then you're really more in the IT realm, in the making and writing part. Like, the algorithms and stuff.

That’s not really my area. Luckily, I’ve got a few folks for that.

00:03:21 Speaker A

Yeah, that’s fine of course. Then let’s look at differences between this model and the reality of your work experience. Does the model match what you’ve observed in practice?

00:03:38 Speaker B

At first glance, it does indeed look like how we basically do it.

00:03:44 Speaker A

Have you experienced situations where the predicted benefits or variables in the model significantly differ from the outcomes in practice?

00:04:03 Speaker B

Well, no, that’s not really the problem. The challenge is more in how you make it actually do what you want it to do. That’s where the real... what do you call it... the benefits of automating certain processes, it’s generally clear that productivity goes up and that your employees can focus on tasks that actually matter.

That’s where the real benefit lies. But before you get to that point, the stuff that has to happen in the background, like writing the code and all that, you really still have quite a few steps to go.

00:05:02 Speaker A

A bit of a side note there indeed. Is that mostly done with actual coding and programming on your end? Or is there also a sort of external top layer with third-party programs used, like you sometimes see, that can actually analyze mouse movements and then replicate those actions?

00:05:25 Speaker B

No, as far as I know, certain Excel sheets or Excel components are created. Those are coded, and based on those sheets, the robot they’ve built can analyze things itself and knows where to place them.

00:05:46 Speaker A

Okay. Well, that’s clear. How do you think the model addresses the impact of RPA on work dynamics? Especially in terms of retraining or job loss. So really that aspect of workforce extensions and freeing up employees' time, basically.

00:06:12 Speaker B

Look, the only thing this model does is take the repetitive, mind-numbing work out of the hands of employees. And what you can then do, is deploy your employees elsewhere, also on more important tasks. You obviously have some, we use it in this case for a financial process, where there’s a bit of legal involved, where there’s a piece of rules and regulations from a financial perspective.

You can’t just throw that into an RPA. That robot acts based on what it’s been told to do within the parameters it was written in. But then you still have to validate it. Like, is what we just input correct? Are those rates actually right? And then of course you’ve got the four-eyes principle.

Has it been entered? Has it been checked? And is it safeguarded? And those processes are still manual for now. You can't just put a robot on that and say, yeah, that's good. Maybe you could, but the way I see it now with us, the final validation steps are still manual and staff-based.

You still need to mitigate your risks in how you're going to handle that and how you've set it up. Look, in our case, if there's an incorrect rate entered, at most that leads to a claim from a customer like hey, we agreed on this, it's in the contract, and I got that.

Then you've got some follow-up work again, but that would still have to be done manually, by your employees.

00:08:25 Speaker A

Okay. Then on scalability and long-term benefits. To what extent does the model take into account the scalability of RPA capabilities and their sustainability in the long run? Is the model viable for strategic-level process management?

00:08:43 Speaker B

I think it's already been at the strategic level for a long time. Otherwise, you wouldn't have those little work bureaus in India and so on, and in Budapest and those kinds of financial centres. Everyone knows, I think every management board by now knows that what we robotize, to put it bluntly, generates extra money.

We can do more things with fewer people, that's one. And often it's also more accurate. That's been at the strategic level for quite some time.

00:09:23 Speaker A

Do you also see those aspects that you just mentioned reflected in the model in front of you?

00:09:30 Speaker B

Yeah, ultimately yes. You're not gonna... Look, there's a piece here about freeing up employees. Eventually, you come to the realization, I have 10 of them now. And I can do it with five, it sounds harsh.

00:09:46 Speaker A

It's one approach, indeed, that's why the model is a bit pragmatic, so you can ideally reallocate people.

00:09:54 Speaker B

Yeah, look and eventually if you're sitting with a works council or one of those committees, I'd never put in there "freeing up employees." What do you mean by that? That we're going to do it with fewer people? Yeah, but that's not the intention, they'll say.

00:10:10 Speaker A

Exactly.

00:10:11 Speaker B

I'd word it differently.

00:10:14 Speaker A

Are there sector-specific factors that could influence the applicability of the model? Legal compliance, strategic goods maybe. I could imagine?

00:10:35 Speaker B

We have an RPA running, that's a different one, a financial piece, but that is indeed what you're basically pointing at, strategic goods. From the Dutch government you've got certain laws and embargoes, things we're not allowed to transport. Take for example the counterfeit from XXXXX. That's not listed on the AWB, but we do have an RPA running that checks all AWBs.

For certain coding, but also where it's going, who's behind it, what's the consignor, that sort of thing. This comes from an area where we know, we need to take a look. So it's definitely used for that. Or was that not exactly your question?

00:11:21 Speaker A

No, that was definitely my question actually. But maybe there are also things that aren't listed in the model, that would specifically apply to the airfreight sector in this case?

00:11:41 Speaker B

Yeah, look it says here in this bit, in your little text it says there's a mistake made, but it's important that we improve efficiency, real-life automation and that here regulation reduces the risk of non-compliance. That is definitely mentioned.

00:12:04 Speaker A

Is that also clearly represented passively in the model, or is it more something that gets explained in the supporting text?

00:12:15 Speaker B

I'd say, yeah, let me see. It's basically fine, I think. You could maybe do a few tweaks here and there, but in principle, this should be explainable to everyone, because it's a general model.

00:12:33 Speaker A

It's not necessarily a sector-specific model, but a general one that was developed based on literature.

00:12:41 Speaker B

Then it should basically be applicable to everything just to be sure.

00:12:48 Speaker A

Well, just now we already talked a bit about the forbidden term freeing up employees' time. How do you think the model could better reflect intangible benefits, like employee satisfaction or innovation potential? Because that's kind of the underlying idea too. You already said, the mind-numbing work is gone. So in a perfect world, instead of firing people, you could put them to work on things that really matter for the company.

00:13:16 Speaker B

Yeah, look, what you of course, if you're going to say, we're taking this out, then the next question is: what are you going to do with those people? Are we going to think about sustainable employability? I think you have to look at the end of your job, what stage your company is in.

Are you in a crisis? Then that basically means, bluntly put, we're going to simplify, robotize, and let people go. Or are you in a business phase where that's not the case at all... Right now we again have a lot of things where we need to cut costs, because income is falling short of expenses.

Take my colleague who works at XXXXX. They've got money coming out of their ears. But they do the exact same thing. Only, when I talk to XXXX, they're busy thinking, how can I deploy those people sustainably? Can we set up an innovation club to look into how to tackle the energy transition? Do we have a few more cuddle sessions together?

You really have to look at what stage or what situation and context your company is in at that moment. And then you can summarize this.

00:14:34 Speaker A

That's kind of what I'm getting from it, correct me if I'm wrong, of course. That section is actually two-sided, right. In good times it has a big advantage in the sense that you can let your staff do their jobs more innovatively and better for the same money, basically. And in times of crisis, when there's just less budget available, you can, to put it plainly, cut them out.

So that's kind of what it comes down to, it depends on the economic situation.

00:14:59 Speaker B

Exactly, if you boil it down, that's basically what it comes down to.

00:15:01 Speaker A

Yeah.

00:15:02 Speaker B

Though I could add a few nuances.

00:15:04 Speaker A

Of course.

00:15:05 Speaker B

But ultimately, that is the case.

00:15:09 Speaker A

Alright, then we'll move on to experience-based adjustments, suggested changes. What specific adjustments or changes would you make to the model based on your own professional experience? You've also got a pen on hand, so you're totally free to scribble on it too.

00:15:27 Speaker B

Well, at first, not really. I'm more someone who likes to just try things first. Let's tinker with it and just play around with it. See how it actually works. I'd first build and implement it. Minimal viable product. We do a test week with a couple of people to see, the RPA is ready, how are we going to run it, what comes out, and based on that you can say okay, here or there I'm going to tweak it.

But in principle you've made a model that you think will work this way, and now you have to test that model. And from the test comes a certain result that you either want to achieve or not. So you can't

just say here's a pen, go ahead and tweak it. If you give it to a real techie, they'll probably go, yeah, you have to do it like this, and that like that.

Because they look at this model from a totally different perspective than I do. Look, from my role, fine, this is what we've got. Let's see how it works. Then I can also assess, I get result A, result B, result C. Is that the result I want or not? Or do I need to tweak this a bit, and then I'll have it how I wanted it.

So based on my practical experience, I'm more of a "build the MVP first and then we'll see what it looks like" kind of person.

00:16:55 Speaker A

And extending from that, are there variables or factors that you think are missing in here, or maybe underrepresented?

00:17:05 Speaker B

Well yeah, look, if I look at the operational risk part, you could split that out a bit more. Like, in what way are we seeing that, and which rules and laws, where does compliance sit, how do you account for that? For me, it's not really my area. If I look at it like this, I'd just play around with it first.

And not everyone does that. But I'm really someone who has to get my hands on it first. Okay.

00:17:39 Speaker A

Then we'll just continue. Some general feedback. Do you think this model properly reflects the complexity of an RPA implementation? Or are there areas where it's oversimplified or could be expanded further? You already mentioned the operational risk part earlier, so it's kind of in that direction.

00:18:06 Speaker B

I think it depends on who you're interviewing. A controller and an IT nerd will look at this completely differently. It's that simple. And they'd say, on this part I'd do that, on that part I'd do this. Productivity might, if you've got an operations manager, they'd ask what this means for their productivity, how does that look?

But I wouldn't change the model itself. This is the model. I think this is how it works in practice. Go build it.

00:18:40 Speaker A

Well the literature says that's how it works in practice.

00:18:46 Speaker B

I'm kind of asking you. What the literature says doesn't really matter to me. You built it based on literature. The literature shows that this has probably already been built a few times over the years. So then this should just work.

00:19:06 Speaker A

What possible implications, positive or negative, could come from using a model like this to predict the benefits of an RPA project? So let's say you've got a tender process or something, could this be

applied at a strategic level in a presentation like: “Folks, this is the direction we need to take, because we expect this and this and this to happen if we do it this way.”

00:19:31 Speaker B

I don’t think I fully understand your question.

00:19:35 Speaker A

If you were to use this model in a context to predict benefits, there are some intuitive things in there, of course. Like, if you automate the process, then what kind of implications does that have? Because we just said, for example, with data processing, that can be automated, but in the end, it’s still under the four-eyes principle and manually checked by real people.

00:20:02 Speaker A

Are there more implications like that, ones that aren’t mentioned yet, that should still be included?

00:20:06 Speaker B

So we’re trying to use it as a predictor, is that what you’re saying? Like a kind of predictive...

00:20:12 Speaker A

Of potential benefits, yeah.

00:20:20 Speaker B

Yeah, I think the potential benefits are already described earlier in your PDF. I don’t quite get where you’re going. Do you want to use this model? It’s a kind of automation step. Am I also going to feed it with history, so that it eventually gets a predictive value looking toward the future?

If I talk about my case, I’ve got five contracts from the same client. That thing processes it all, puts it all in. What does my client’s trajectory look like? Is that what you’re looking for? What have they actually done over the past five contracts? Which destinations show up again? Where is the value for us...

00:21:12 Speaker A

No, that’s not what I’m looking for.

I’m more looking at the internal operational processes within the company itself, actually. So you now have this analysis that you can do. And what consequences does that have within the working environment? Does it go faster? Can you follow up with the client more quickly? You suddenly see volumes dropping or something, or there’s a pricing mismatch.

So more the operational consequences for you personally, and the implications of using such a model, rather than the output of the model. I’m just thinking of an analogy, like, if you need to saw something, is it better to use a band saw or a jigsaw?

It’s really a tool in itself, and the implications of using that tool.

00:22:05 Speaker B

That depends on what you’re getting into. If you use your analogy, then you’re looking at where can I actually use this tool. You can use this anywhere, but for repetitive work. Whether that’s on the financial side, or the marketing side, or on the sales side...

00:22:24 Speaker A

Do you maybe have a concrete example from your own experience where you thought, this would've been useful?

00:22:35 Speaker B

Well yeah, we're currently building one of those things for inputting rates. But I also know there are ones for destinations. And with those, entire networks are built. Just based on the information we receive. The internet work looks like this. We've got the product.

Where do we all fly to?

00:23:01 Speaker A

Okay. Then one final thought, really. Is there anything else you'd like to add, or other comments about how this model could better...

00:23:17 Speaker B

...represent the benefits? No, because I just don't have enough experience for that. I couldn't really come up with anything just like that.

00:23:26 Speaker A

Something to adjust. That's also an answer, of course. It looks good enough.

00:23:34 Speaker B

For my limited knowledge of Domotica and RPAs, it looks fine. But I'm also someone who needs to see it in action. Because if I see the result, then I also know, like, hey, does this... Then I can translate it for myself, and then you can also kind of conceptually go back, like okay fine, then I need to adjust this and this and that.

00:23:56 Speaker B

On a scale of 1 to 10 then, if you had to rate this model, just on usability.

00:24:13 Speaker B

I think the usability is just an 8. It's a proven technique. It has limitations. You can't do everything with it. You can't teach a robot something we as humans can. Like, we can apply a certain margin of error within certain parameters. But you and I, because we have actual eyes, we know that even if it's just outside the range...

Then it won't catch it anymore, but we'll still see it. And that might only be a tenth off. That human aspect that you're taking out, which you're using this for, it will never replace the human. But that's also not the goal of the model. I think the goal of the model is to simplify the work.

00:25:14 Speaker A

Well okay, I think that's a beautiful closing with very wise words. I thank you for your time and valuable insight. I'll further transcribe this and include it with the collection of the next interviews, and then kind of build a collective from all the input and create the second version of the model.

00:25:34 Speaker B

You’re very welcome. I look forward to hearing the other results.

Appendix I: Transcript expert interview 3

00:00:01 Speaker A

Good morning. My name is David Ostroga. On behalf of the University of Twente, I'm here for a research project. This will all be treated confidentially. It won't be shared with third parties. And all questions will be anonymized. I myself am working on my thesis in the Digital Business track. And that specifically focuses here on Robotic Process Automation.

And particularly within the logistics sector. For that, we've developed a model to map out the benefits of these types of projects. In front of you there's a copy of a model based on literature research. The goal of this interview is to get your expert opinion on it. So to speak, as an expert in the field, to get some new insights from that.

The model has already been read through briefly to get a sense of what it's about. So the first question, very exciting, but who are you and what do you do?

00:01:03 Speaker B

The most exciting question. I'm XXXX, one of the consultants at XXXX. I basically handle the implementation of software packages for our clients.. That includes a bit of advising and realization. That's basically my main activity within the company.

00:01:28 Speaker A

Let's see, in your opinion then, based on what this model is from literature, do you guys also have any sort of additional training or anything like that to stay up to date with the latest developments in the market?

00:01:48 Speaker B

Yeah, for our developers, they have to regularly take courses on the newest techniques,think about programming languages and infrastructures. For our consultants, it's more like, well, if you want to study something, you can decide that for yourself. So, like, you go do an online course, go check something out somewhere, or however you prefer to handle it.

Most of the time, we do see that people just learn by doing. Yeah, you get handed a case and, well, go for it. See what obstacles you hit and how to solve them. That's usually the challenging part.

00:02:34 Speaker A

Is that also something you personally use, this extra training?

00:02:38 Speaker B

I haven't yet myself. That's just because I already have a technical background in most of it and I naturally enjoy diving into that stuff. Seeing how things can be done more easily. Others do though. But most of what I do is really ad hoc at the client and then we puzzle through things with strategic partners.

00:03:01 Speaker A

Yeah, then a big question right away actually. Does the model match with what you've seen in practice?

00:03:09 Speaker B

I'm glancing through it real quick again, but actually in broad lines, yes. You have a project, and you look at what the load is on the business and what the conditions are and how to best align with that to take the burden off the planners. That's what we also see.

Look at planners, for example,they're more and more looking for the functionality of automated planning instead of the manual planning like we used to know. And between systems themselves we also see more of the trend like, hey, let's hook everything back together again. People used to want everything in one package.

They've moved away from that, because that often ends in custom solutions. But yeah, the market's also realizing, hey, that doesn't work anymore, it's way too expensive. So let's just go back to...

00:04:04 Speaker A

Have you been in situations yourself where the identified forms of benefits or variables in the model deviated significantly from the outcome in practice?

00:04:26 Speaker B

I'm working on a project now for a big client. They've got a really optimized warehouse and production line. But they didn't have a transport package yet. Now they do. But we're running into issues there. That's where this model fits pretty well. I recognize how they approached it. It matches pretty much one-to-one, but we're a bit stuck on the execution in their logistics department.

We're still in the first three blocks I think,project, information exchange, and what does this save in workload. Yeah, we've definitely seen it, but also a lot of companies still need to catch up. That especially. Both big and small ones still often work manually and it takes a lot of resources to organize.

00:05:34 Speaker A

Yeah, and then indeed, well, that's the nice thing about this interview of course,specifically in the logistics sector, based on literature research, kind of the justification of the research is that logistics actually lags far behind other sectors. What's your view?

00:05:52 Speaker B

Yeah, bluntly said,you see that there are basically two types of companies, both big and small. You've got the more serious people, the ones who go along with modern technology and who have some knowledge about how to handle things and set them up. But you also have the more old-school type, kind of like, "where do I even start?"

The "I put my mouse in the upper right corner"-type, and they actually do that. For example, we had a father-and-son company as a client, they're in building materials, and they still plan everything in Excel with colored boxes and check how it works. And then you see that implementing such an IT solution takes a long time.

But in the end, they did get gains in terms of time and planning. Before, they took half a day to coordinate everything. Now it's just an hour. That's with the automated processes you're aiming for,a big win. Also big companies, like this large cutting plant.

Really nice warehouse, super well organized production line. But then you get to the planning department for the logistics project. Excel. I used to be surprised, but not anymore. You definitely see a change strategy though.

00:07:31 Speaker A

Impact on work dynamics. How do you think the model deals with the impact of RPA on work dynamics? Especially when it comes to reskilling or job loss. Because yeah, here we see very nicely of course “freeing up employees’ time.” And that can be interpreted a bit both ways.

00:07:50 Speaker B

Yeah, I always joke that I want to make sure your planners can go home an hour earlier. That’s always a nice line. But automated processes, I gotta say, they take a lot off your plate. You often don’t have to think anymore about your resources, what’s still available, what you can still use, or how to communicate it. But at the same time, you also notice another story starting to play out and that’s knowledge management.

Once things are rolled out, they still need to be maintained, and we often say like, we want one person in the organization to be kind of the knowledge base reader.

Yeah, that transfer of knowledge between employees has to happen. If you don’t do that, then the whole digitalization process in the company is pointless. Because they’ll just come back like, how did this work again or how do we do this again. A good example: we have a client and one of our former colleagues was quite handy and he had set up an automated process where transport orders were converted to documents, those documents were emailed to a Gmail inbox, an automated kit read the inbox again and then it was sent off to the third party.

That doesn’t work anymore. And no one knows how it works. So the client is screwed. So basically, automation is really nice, but afterwards it takes a lot of time to keep up within the organization. And that’s kind of the struggle we’re dealing with now.

00:09:29 Speaker A

Okay, so I’m kind of hearing that “freeing up employees’ time” also links to, yeah I don’t know, upkeep of knowledge or something like that. Like, everyone still has to know what’s there. Kind of like the elementary school principle. Like, yeah, a calculator exists, but you still need to know how the math works.

00:09:48 Speaker B

Exactly. That’s a really good comparison, actually. And luckily there are also advantages. You only see those in really big organizations though. They have application managers. And those are the key figures with all the knowledge about the application. And they also take care of internal training and stuff like that for new planners, new employees.

Fleet managers, for example. If they’re not there, you’ve got a problem.

00:10:17 Speaker A

Yeah, economies of scale, basically. To what extent does the model consider the scalability of RPA projects and their sustainability in the long run? So is it something that could be applied kind of one-time or also more on a strategic level? Like, we want to move in this direction because the model says it’s good?

00:10:54 Speaker B

Yeah, I don’t really know to be honest. I hear you mention sustainability and what people are really looking at now is zero-emission zones and tracking CO2 emissions.

00:11:12 Speaker A

That’s kind of becoming a legal requirement more and more, right?

00:11:15 Speaker B

Yeah, and especially starting January 1st, 2025 if I’m not mistaken, for some cities it’ll be mandatory. That’s purely because that area is still pretty unclear, so I don’t really know how this model or other models will address it. Because you’re totally right, it has to be automated. But we already have some cities saying like, I’ve got a depot on the edge of the city and transporters can only go there and then I have to hire new people to deliver within the city.

And there I still just have question marks, yeah.

00:12:01 Speaker A

I was just thinking myself, for the planner, maybe something like based on a license plate or something, a link with the RDW database. Because all the details are in there.

00:12:04 Speaker B

Yeah, of course. We say like, we’ve got a fleet in the system. They have their own attributes. Think of electric trucks. But to give a very concrete example, Amsterdam will soon be emission-free. You’re not going to drive a 40-ton truck over the Amsterdam canals. Those streets just can’t handle that. So you’ll be dependent on a hub. So you’ll need to have a link, an automated process, between a hub and a major transporter that delivers to the hub. And then how are you going to communicate that whole process? And that’s where I still see kind of a missing link, so to speak, with third parties.

00:13:04 Speaker A

Yeah, right, to kind of come back to the model again. That’s a bit in here under error rate and following rules law, really. A bit of compliance that tries to be captured.

00:13:15 Speaker B

Basically, yeah. And security. But that’s often the operational risk, indeed.

00:13:37 Speaker B

Yeah, look, I spoke to a client. He says a lot,he has the ability and knowledge to renew and digitize his fleet. But he doesn’t have the resources for it. He doesn’t have power.

00:13:58 Speaker A

Yeah, the other side of the story, indeed.

00:14:00 Speaker B

Yeah, they’ve got their whole roof covered with solar panels, but they’ve only got a connection for 10 vehicles. So now they’re kind of forced to install those big batteries on the site. And then how are you going to measure or keep track that if you’ve got trucks available, you can charge those trucks at the same time?

And that’s also part of, I think, operational risk.

00:14:33 Speaker A

Let's see. Well yeah, that's nice, because we've kind of touched on it. Are there any sector-specific factors that could affect how applicable this model is?

00:14:47 Speaker B

We haven't really talked about the CO2 regulations.

00:14:51 Speaker A

That was very sector-specific.

00:14:53 Speaker B

Pretty much.

00:14:54 Speaker A

Yeah, exactly.

00:14:55 Speaker B

What else?

00:14:57 Speaker A

From my own experience in the field too, like when you're working with more partners from Eastern Europe, Central Europe, then you're also just missing a huge step in the digital transition. Here it's already lagging behind other sectors, and then also partly based on my own experience,because it's really just taking a photo of a delivery note with a wet signature and stuff like that from those links in the chain.

There are just still four people in between who are basically playing a game of telephone, really.

00:15:28 Speaker B

True. That's definitely one of the challenges in logistics. We're still working with paper, but we want to get rid of paper. CO2, but we're not talking about that anymore. And people. It's just about getting people for the solutions. Yeah, you hear that everywhere. Yeah, those are kind of the three stumbling blocks in the sector.

00:15:52 Speaker A

How could the model better account for intangible benefits, like employee satisfaction or innovation potential?

00:16:09 Speaker B

Employee satisfaction in automation. Oh boy.

00:16:13 Speaker A

I'm going to cheat a bit here. I'm going to frame the question slightly. I've already established with others that it's kind of under the idea that they can be a better employer. In the sense that these projects really try to automate the boring, dumb work as much as possible, so that employees can keep being challenged and do fun stuff.

00:16:32 Speaker B

Yeah, look. Then I kind of go back to the APS bit from earlier. Companies get a flood of orders and you need to book them in. The benefit of APS is that it gives planners a proposal for a plan, which is super nice, and that the planner can challenge themselves with the weird cases, so to speak.

That's definitely a place where you can gain in satisfaction for office staff. For road staff, it's harder, because you see that road staff are being increasingly monitored through digitalization.

00:17:18 Speaker A

Okay.

00:17:18 Speaker B

I've got a case running at a client who asks, what kind of vehicle coupling options are in your package? Actually nothing. Oh, he says. Because I've got cameras in my vehicles and I want to read the tachograph and I basically want to know everything my driver says. If he farts, I want to be able to smell it, almost.

Because it affects his driving behaviour. And you notice especially that, like, people from Eastern Europe aren't too thrilled about that. They just want to drive. It'll be fine. But yeah, that's not how the owner of the fleet thinks. And there you do see some dissatisfaction that's hard to fix with tech.

00:18:05 Speaker A

Yeah, then it's really tough to get the stakeholders on board with that.

00:18:13 Speaker B

Yeah, beyond that, satisfaction and optimization.

00:18:17 Speaker A

Innovation potential. Innovation, sorry. Then we've got more time to think about how this could be better or whatever.

00:18:25 Speaker B

Well yeah, that especially. Look, when it comes to innovation we mostly see it in the APS part, and that people no longer have to think about certain things. Like, vacation days is one example. Links between HR packages. That you only have to maintain your admin in one place. And that we can use that to automatically fill in the duty rosters for the planner.

That's the kind of stuff we're thinking about now.

00:19:08 Speaker A

What specific changes or adjustments would you make to the model based on your own professional experience? As mentioned, you're totally free to mark it up and cross things out and tweak it however you like,that's actually encouraged. Following up, are there any variables or factors you feel are missing or over- or underrepresented?

00:19:40 Speaker B

I'm actually missing a bit on management. Often you see that when we've gone live with a package, we usually say like, hey, it's running in its basic form, but you'll want to tweak it a bit later. If I look at it now, I feel like the model doesn't really account for that.

Because it does nicely say like, hey, I've got an error rate, to check if I'm within the margins. But you really only get that after your productivity step. You only really know you're doing it right once you've implemented the changes.

00:20:36 Speaker A

Yeah, exactly.

00:20:37 Speaker B

That's kind of my take. So I'm kind of missing a loop back into the diagram, in some way. Right now it's like, hey, I roll it out and then I work with it.

00:20:52 Speaker A

Yeah, the way I hear it, it would actually be that,

The decrease in error rate also increases productivity. And the increase in productivity again reduces the error rate.

00:21:10 Speaker B

Basically, yeah. How can I say this really bluntly? You've also got a transport company. If I now say to your planner, you have to go from A to B to C to D. Then he'll do that the first time, but then says, actually I'm noticing that at C I'm switching carriers too often because I'm running into issues with those executors.

Then we need to act on that. And then you need to adjust your automated process.

00:21:45 Speaker A

It's kind of a feedback controller, right?

00:21:48 Speaker B

Yeah, feedback processing indeed.

00:21:55 Speaker A

And how would you draw that in?

00:21:58 Speaker B

Yeah, I was just looking at that. I'm going to sketch something out, let's see. I'll put a check here. I hope you can still read my handwriting later. Yeah, I'd actually want to hook it in between the layer of error rate and information exchange. That's still kind of part of productivity, I'm circling back again, yeah you're already looping it back a bit actually.

Okay, I'll just draw something there in between. Because then you've got your information delivery arranged. You've got your boundaries for where your error margin can fall. And then you end up at productivity and control. Where you can verify it.

00:23:32 Speaker A

Okay, then we're slowly heading toward the conclusion.

00:23:35 Speaker B

Wow.

00:23:37 Speaker A

Yeah, it's just short and to the point.

00:23:39 Speaker B

Yeah, totally fine.

00:23:40 Speaker A

Well, like I said, because you read through it beforehand, that also saves some time during the interview. Do you think this model reflects the complexity of RPA implementations well, or are there areas where it's oversimplified or could be expanded? So whether you're explaining it to field staff or to the board,then you've got some flexibility in how zoomed in or out the model is, so to speak.

00:24:13 Speaker B

Yes and no. You shouldn't show this to field staff. Think of drivers, planners, admin ladies. But if you present this to consulting firms, consultants, and management people, then yeah. You do touch on all the important fields to keep in mind in the model. They'll definitely see the value in that.

Only, I think it's a bit too complex, slash too abstract for the people who have to work with it.

00:24:56 Speaker A

That especially. Following up on that, what are possible implications, positive or negative, if you start applying a model like this? For the field staff, they might get a bit freaked out or something.

00:25:09 Speaker B

Well, that mostly. You notice that the field staff is often like, hey, I want to do as little as possible. Which I totally understand. And usually when you show up with stuff like this, also with new applications, they say: "here we go again." We have to learn something again and do new things and I don't feel like it. That kind of resistance.

00:25:35 Speaker A

Just to make it explicit then, for the management layer or strategic level, from that angle such a model can definitely be used to get more stakeholder alignment. Like, noses pointing the same direction, this is what we're working towards because we expect this.

00:25:51 Speaker B

Yeah, I agree with you on that.

00:25:55 Speaker A

Last chance, anything you want to add or remove or whatever?

00:26:01 Speaker B

No, just the extra control step, nothing more.

00:26:05 Speaker A

On a scale of 1 to 10, how would you rate the model in terms of usability as is?

00:26:14 Speaker B

I think still an 8. Definitely. It's something we're already seeing return. The only risk is for the people on the work floor.

00:26:36 Speaker A

And is this model capable of properly identifying and analyzing the benefits?

00:26:47 Speaker B

That's a bit weaker. But that's mainly, I think, because it's kind of flat. I do see where the plus signs are, I assume that's where the gain areas are. But I think it'd be clearer if you set it against an actual case. Like, company X has these problems, we put this model next to it, and we gain that?

That's kind of the stuff you're working on. I thank you for your time and contribution.

00:27:43 Speaker B

Likewise, I enjoyed it.

Appendix J: Transcript expert interview 4

00:00:00 Speaker A

Yes, it's recording. Alright then. Well, good morning, afternoon. I'll just briefly introduce myself. My name is Dawid, on behalf of the University of Twente I'm working on my graduation project about RPA and process automation, especially in the logistics sector. Who are you and what do you do? This interview will be recorded and accordingly anonymised.

00:00:21 Speaker B

Yeah, I'm XXXXXX, I'm the owner of a software company and we help businesses work more safely and smarter with great modern solutions in the field of security and productivity.

00:00:33 Speaker A

Okay, that's clear. Yes, this interview will still be transcribed and furthermore it will be treated confidentially and not shared with third parties.

00:00:45 Speaker B

Fine.

00:00:46 Speaker A

Just to get that out of the way as well. The goal of this research is to investigate the RPA model that you have in front of you and how applicable it is in the practical sector, in practice, yeah in practice. And we're going to ask some questions about that and from there we'll brainstorm, so you can kind of sketch and mark things up and then we'll see what comes out of it.

The idea is to, together with this interview and four others, come to an adjusted final version which will then be evaluated through a case study.

00:01:26 Speaker B

Fine.

00:01:27 Speaker A

Yes. Let's see. You already have the model in front of you and the textual explanation of the model. Due to time, you also read this beforehand. The first question, let me check. How do you think the model aligns with the current literature about the benefits of process automation through RPA?

00:01:55 Speaker B

Yeah, I think there's a lot of overlap. Yeah, what stands out especially in the model you've now developed is, for example, the error rate goes down, I see that a lot as well with my clients with RPA solutions we've implemented there, they've become much more efficient because they no longer had to perform certain actions themselves.

Which resulted in significantly improved productivity and gave employees more time for other things. Which ultimately benefits your operational efficiency and could lead to potential cost savings. So those are definitely things we also keep in mind when we set up such a solution for a client.

00:03:00 Speaker A

You already mentioned you have some experience with implementing RPA solutions. Could you elaborate on what kind of processes were automated exactly and what that looked like?

00:03:17 Speaker B

Yeah, I can briefly sketch two cases we've done. One is for an organization involved in mental health care. It's a kind of front desk. Individuals can turn to them if they're experiencing certain mental health problems to seek help. They go to the website of the care provider and can basically submit a request for help.

To do that they have to go through several different forms where they indicate what their current issues are, their details, how to contact them, who for example their GP is, where they live. That info we take in, we sort of capture that and we place it in the client's own system, which already gives the organization a saving on, well yeah, the intake process.

Previously, people could call and email. Then you always had to retype certain data manually. There's room for mistakes there, because someone might not hear a name properly, or forget some info, or it gets copied and pasted incorrectly. But that's prevented now, because there's all kinds of checks in place.

Once it's picked up and placed in the client's system, we also run some processes in the back that immediately prepare documents for those clients. Like a kind of registration letter, a checklist, and the moment that care provider checks off like hey, we've now sent the intake to the client, then a follow-up document gets prepared too, which can be shared with a GP or another care provider, where all the client's info is already filled in.

So yeah, we're actually involved in the client's whole primary process to automate as much as possible. So from the very beginning when a client signs up to the end, we've built in all these smart things, smart checks to take as much work off the employee's plate as possible. So that's really cool.

And what the main benefit there also is, is that they make way fewer mistakes and it just gives those employees way more time to actually focus on those clients instead of all the system registrations and such. Because they just have to document so much and can't afford to miss crucial steps anymore.

Because they're really guided through the whole process.

00:06:29 Speaker A

I think for the rest of the interview it makes sense to just keep this case in mind while answering the questions, really. I think that makes a big difference. Indeed, because I can already tell the next question is kind of already covered actually, whether the model aligns with what you've seen in practice.

But then, keeping this case in mind as well, have you experienced anything in this case that significantly deviates from the model? So something where you'd say, yeah, that really didn't apply to us at all actually.

00:07:06 Speaker B

In this model, we didn't really do a check on regulations. On the one hand maybe we did. We did check the systems we use for this , so for example, if you're talking about Power Automate, we also combine that with some other tools, like a Zapier, maybe you've heard of that , we did check where they store the data, so to speak, and who has access to that data, whether they comply with certain

standards, if they have their ISO certifications in order, those kinds of things, we definitely looked at, so yeah, that, we did do.

So yeah, I don't really see any things that we, I think, didn't...

00:08:13 Speaker A

That's also an answer, right? No need to make it complicated.

Then a spicy question. People tend to kind of laugh at the next one. It's about the part in the model regarding impact on work dynamics. Because I put that down very pragmatically as freeing up employees' time, and that can sometimes trigger a bit of nervousness of course. But how do you think the model handles the impact of RPA on work dynamics, especially regarding retraining or even job loss?

Because those are kind of the two sides of it. You already said that the nurses in this case could spend less time on admin and more time on caregiving, indeed.

00:08:56 Speaker B

No, that's absolutely true. In this organization, if I look at it, before we did this, they had the same number of FTEs as they do now. But they've now been operational with this system for over a year. They've at least kept all the people, but I do think that with the same capacity they're now also able to serve more clients.

So they can actually scale up without immediately needing more staff. I do have to say, we haven't measured exactly how much time this actually saves them.

00:09:43 Speaker A

That's kind of exciting. In a way. It's actually kind of the whole selling point.

00:09:50 Speaker B

No, for us it's like, it's because when we came in there, we tackled this right away, because they came to us and said like, well, yeah, help us just do things more efficiently and also with fewer mistakes, and so that new staff that joins can get up to speed more easily, because they just have to remember way fewer process steps and things, and they're less likely to make mistakes because the system kind of guides them in the right direction.

What is true , and maybe this doesn't quite fit with this question , but what we've also noticed is that sometimes it needs a bit of fine-tuning, because you're exchanging info with different sources. Sometimes something changes on the backend or gets tweaked. And then all of a sudden you get reports like, yeah, new clients aren't showing up on our new clients list anymore, so to speak.

And then it turns out the system they use for everything , their main system, let's just call it a CRM system , has made some backend changes, which basically breaks the connection. So those are things, like, I think every quarter or so we need to do a kind of check-up, like an MOT for the system, to see if everything still runs and works properly.

And sometimes you just discover things afterwards, like at some point we had an issue where a phone number could be entered in different ways. With a plus sign, with two zeros, international format, or not. And we realized we weren't catching that at the front end, users could just input whatever.

So we had it set up so that in the middleware we use, we would translate that ourselves. But in hindsight that wasn't the best approach and now we've enforced it at the front end that the phone number has to be entered in a fixed format , the international one.

And now it works properly throughout the whole cycle. But those are the kinds of things you just discover over time. Because the first hundred times it might all go fine just by chance. And then suddenly things go wrong a few times. It's still, even when you automate something, it's good to check whether it still works the way you originally designed it.

Because something that goes right automatically, can also go wrong automatically.

00:12:32 Speaker A

And that can go really fast. Yeah.

00:12:35 Speaker B

Exactly. But to come back to your point, freeing up employees' time. Yes, I see that as very positive and I think in general in most cases it comes down to employees being happy that some of those repetitive tasks , yeah, that maybe they didn't enjoy doing anyway , get taken over and that gives them space to do other things. That's how I see it.

00:13:01 Speaker A

Time really is a thing with RPA, and RPA really takes out all the chores.

00:13:07 Speaker B

Yeah, and what is true of course is that if you're going to implement it in companies where there's really someone whose job it is to compare data manually , that job will disappear.

00:13:20 Speaker A

Yeah, that is what you're talking about indeed.

00:13:24 Speaker B

Exactly, yeah.

00:13:25 Speaker A

You already said some interesting things earlier, also regarding scalability and long-term benefits. To what extent does the model take into account the scalability of RPA projects and their long-term sustainability? So for example, like you just mentioned, that onboarding new staff becomes much easier this way.

So your knowledge transfer and such.

00:13:53 Speaker B

I think that's one of the really big advantages, and maybe also some flexibility towards the future. Because you've automated certain things, you also have a really clear overview of what information you're working with, what data is being processed, and that makes it easier in the future , if you ever want to switch to other systems, those kinds of things , because you already know what to pay attention to, what data you're dealing with.

So that's maybe also just a practical benefit for the future. But yeah, also what you said, onboarding new staff just becomes a lot more efficient.

00:14:45 Speaker A

Nice. Then the question: sector-specific considerations. I'm not sure whether we should talk about healthcare or just your own company, since you use it too. Are there sector-specific factors that can influence the applicability of this model , and really reasoning from your own experience?

00:15:08 Speaker B

Yeah, if I look at what we've automated ourselves at the moment, there are definitely some sector-specific influences. For example, for us we've automated it in such a way that when we purchase software and licenses from a distributor, we also need to translate what that means for the customer invoice when we purchase that software.

We've made an automation step in between that as soon as we buy something from that distributor, it automatically gets processed in the accounting system in the customer's subscription, and from that subscription invoices are generated every month , because a lot of it is based on subscriptions and contract periods. We haven't done this yet for one-off purchases like hardware, but we have for basically all the software purchases we do.

And sometimes we do run into challenges, where suppliers suddenly decide to add a new product that we haven't adopted yet. Or they announce price increases that only apply from certain volumes or durations, that kind of thing. That's something we always have to keep a close eye on, because if you don't stay on top of it, then things can go wrong automatically again. That's just something that happens quite a bit in the IT sector.

00:16:59 Speaker A

Yeah, so just to make sure I understand correctly , what's important in your sector specifically, in projects like this, is really just the data inflow, so to speak.

00:17:10 Speaker B

Exactly, that you at least make sure it's correct in your source system. Because in the sector , in the IT sector, the IT services sector , there's still a lot going on. And yeah, we've got something like, I think it's more than 3,000 products in that system now that we can supply.

But in general, the supplier does help us keep those things , at least the source system , up to date. Only in some cases that's not always possible, because sometimes we also set a specific price for a customer, and then the supplier obviously can't just go and change that.

There are still some complications there from time to time, which is why we're very sharp on that. And also, if we know there's been a price change, we go through that whole process to check , to always do that final check , to make sure the invoices really are going out correctly now.

And that's something we still do manually now, that extra check. But it's nowhere near the work it used to be when we had to check everything. So now it's more like random sampling , like hey, we know Microsoft had a change, so we pull a few customers out of the list to check how it's showing up there.

Yeah, just see if everything's correct. That's what we do. So now it's, yeah, kind of our control mechanism, where before we basically had to check every single invoice , and now we can just scan quickly to see if there's anything odd.

00:19:04 Speaker A

You're much more into exception management now, basically.

00:19:07 Speaker B

Yeah exactly.

00:19:09 Speaker A

Okay, yeah, I didn't mention it at the beginning, but you're totally free of course to scribble and tweak and whatever. That's also the idea.

Yeah, because another thing the model is still kind of looking for is the quantification of intangible benefits. How do you think the model could better address intangible benefits, like employee satisfaction or innovation? That can be as simple as an arrow in a box, right?

00:19:41 Speaker B

That's a good question. You're talking about... well, what I'm thinking of in terms of employee satisfaction , that could lie in the fact that productivity and maybe also job satisfaction goes up, because they have fewer repetitive tasks to do.

That's something I'd think about , because then they might get to do more work that they actually enjoy. Yeah, I think... yeah... other than that I don't really see much else to add to the diagram.

00:20:45 Speaker A

But yeah, that means it's very much in line with what literature describes, then. Alright, then a more general question about the whole model. Are there variables or factors you find missing or underrepresented? Like, you might say, here you have "productivity" and "operational efficiency" , you could interpret that as basically saying the same thing twice.

How would you see changes from your perspective? What specific adjustment or change would you make to the model based on your own experience? That could be either an addition or a removal.

00:21:43 Speaker B

Yeah, I think I would add some kind of control step into the model somehow. Maybe, I don't know if that should be a separate box or something, but that does come to mind. Let me see… What exactly do you mean here by the term Workforce Extension?

Because that goes toward this following the rules/law block?

00:22:16 Speaker A

Referring to the case example, it basically means you have a kind of phantom admin staff member who's doing all the work of an administrative employee. Kind of in that sense , that your workforce is virtually extended…

00:22:37 Speaker B

Got it, yeah yeah yeah. Yeah, this of course does , yeah, on the one hand, freeing up time, cost efficiency, yeah no that makes sense, that's definitely one of the positive effects. Depending on how you interpret freeing up time.

00:23:48 Speaker A

That's something I also discovered during the interviews. People interpret it differently.

00:23:54 Speaker B

And then you've got process hours, productivity... I actually think you've described quite a clear model here.

00:24:06 Speaker A

That's an answer too. That's great. That's actually nice to hear, even. Then I'll just move on to the more wrapping-up questions.

So, do you think this model properly reflects the complexity of RPA implementations, or are there areas where it might be too simplified or need to be expanded? I'm going to frame it a bit , other interviewees have mentioned that it really depends on who you're talking to. Like, if you're discussing it at a strategic level, then a more detailed version might be better. But if you need to explain to someone on the work floor why we're doing something a certain way, then a simpler version might be more useful.

00:25:10 Speaker B

Yeah, I think so. Because you can already see how many different parts, steps it touches on. What I immediately thought of when you asked that question was , it also really depends on the data you have, and the data you get, and what you can work with, and what integration options there are. I don't immediately get that from the model. I also don't know if it necessarily belongs here. It's about efficiently exchanging information. That's what I personally find the most complex when it comes to this.

There's obviously a big difference between automating something that just deals with one system , like a very simple example, a purchase receipt that gets generated somewhere, which you have to compare with a kind of purchase list you've made yourself , or whether you're dependent on data from multiple vendors, which you have to gather first. Where you also have to make sure it all gets stored in the same , well yeah , in the same source, so to speak.

Do you get, for example, the cost price from all of them? And is that in the same currency or do you have to do something about that too? Does one have prices listed annually, and the other monthly, and do you have to deal with that too? That's what I always think of first when it comes to whether a process automation project is going to be complex.

00:27:09 Speaker A

What are possible implications that could arise when using such a model in an RPA project? Like I just mentioned , showing someone that they're basically being automated out of their job, or trying to make it clearer to upper management why you want to do something a certain way. Is the model usable for that?

00:27:15 Speaker B

Yeah. Yeah. Yeah. Yeah. What does come to mind is , an important part is often also, yeah, where do you place the responsibilities for this whole thing when you start a project like this? Who's responsible for what, how do you make sure it's properly embedded in the organization, so that it gets the right attention, and doesn't fade away , and that people don't start doing things their own way again, or go around it because it doesn't quite do what it was supposed to do in the beginning, or because they expected it to do certain things that it doesn't, so they start circumventing it, basically.

So yeah, then maybe you're also getting into operational efficiency, like , it's not just about reaping the benefits, you also need to put in effort yourself to make it a success, you know?

00:29:00 Speaker A

Alright, then now the last chance to add blocks, remove things, add pluses or minuses. Whatever you think.

00:29:10 Speaker B

I don't really have anything to add, actually.

00:29:12 Speaker A

Then that's clear. Then the final question , on a scale from 1 to 10, and you can write that down on the paper , what score would you give the model, as is?

00:29:32 Speaker B

Yeah, I'd give the model an 8.5. Just because I think it's a very clear model. Also with the explanation alongside. It really makes sense and it's recognizable.

00:29:50 Speaker A

Great. Then all that's left is to thank you for your time and very valuable insights.

00:29:56 Speaker B

You too.

Appendix K: Transcript expert interview 5

00:00:00 Speaker A

My name is Dawid Ostroga, I'm here on behalf of my master's thesis for a research and an interview. It's about RPA, so that's Robotic Process Automation, where we mainly look at low-threshold process automation that applies at multiple layers within the company and the possible benefits of that.

And that's the approach of the research. In front of you, you've already seen a model which, based on literature research, was put together by me, and the goal of this interview is really to receive feedback on that model, and where applicable, improvements or confirmations that in reality it's the same way.

Naturally also, as discussed, all data will be treated confidentially, audio fragments won't be shared further, and all data will be anonymized and processed further in the research. So, first of all, from the appendices of the research report, you've already seen the model and the written description of the model.

00:01:09 Speaker B

Yes.

00:01:10 Speaker A

Actually. Then the first question is really, who are you and what do you do?

00:01:17 Speaker B

My name is XXXXX, owner of XXXXX. We're a marketing agency and we've been doing this for over 10 years. And we focus on supporting businesses, small and large, in their online marketing and making sure they achieve their online marketing goals. We have different tools for that.

Think of online advertising, an email tool, social media, advertisement, those kinds of things. Yeah.

00:01:55 Speaker A

You've just looked at the model. What are aspects that you think are consistent with broadly accepted findings?

00:02:14 Speaker B

I do agree that if you can automate repetitive tasks and you've tested it properly at the beginning so that it goes well, then yeah, the chance is also high that it just keeps going well, which of course allows you to make a major efficiency improvement in your productivity. So I definitely believe that.

If I look at my company, how things are arranged, and to what extent we've automated certain things. Look, a robot doesn't really come into play for us, but automation definitely does. I'm thinking for example of our accounting. We've got an accounting system where we can automate things. Think of sending, scheduling invoices, sending reminders.

When people pay through iDEAL it gets automatically marked as paid. So in our accounting I've already implemented quite a bit of automation. Reminders, that kind of stuff. And that of course saves a lot of time and effort, because I don't need to think about hiring an external person for that.

00:03:27 Speaker A

Yeah, but that's also the fundamental concept of RPA actually, those small, few-minute tasks,

00:03:33 Speaker B

You invest some time in the beginning, I see it more like an upfront investment to get everything set up properly, but once it's running smoothly, it keeps running smoothly. And we actually almost never have questions about it or things that go weird.

Yeah. After that it just always works.

00:03:52 Speaker A

No, exactly. So then, differences with reality, if you look at the diagram in front of you. Yeah. Do you see discrepancies with reality or would you say it lines up fairly well?

00:04:09 Speaker B

I think it lines up fairly well, yeah.

00:04:14 Speaker A

Good to hear. Have you ever experienced situations where the correlations or predicted benefits deviated significantly from the outcomes in practice? So that you try to make an automation push, but then, like with many IT projects, it ends up being more work or more of a money drain, whatever you want to call it, than was known beforehand. And the results didn't deliver what was promised.

00:04:54 Speaker B

Yeah, it's hard to make that really concrete, and I'm not sure I even have a good example for that. I don't think so, in my case.

00:05:11 Speaker A

Okay, that's also a completely legitimate answer of course.

00:05:16 Speaker B

Yeah, no, I'm thinking hard about it, but no, I can't really think of something.

00:05:23 Speaker A

Another factor lies with employee satisfaction, time freedom. How do you think the model can impact work dynamics? Especially in terms of reskilling or job loss, because there is a cost-cutting angle in the frame of efficiency.

00:05:39 Speaker B

Yeah, I do believe that automating processes, digital processes, of course can lead to needing fewer people. That I understand. And you can structure things more efficiently. On the other hand, it also opens opportunities, because I also believe that digital automation requires people who have the right knowledge to set that up properly.

Look, if you can replace people with digital automation, you still need people who understand the digital automation. And I see a lot of opportunity in retraining people, to be able to manage that well. So that across organizations you can just work much more effectively, much more productively. And in that way gain competitive advantage over your competitors in the market.

00:06:36 Speaker A

I'm happy to admit that, because I also designed the model a bit pragmatically in that sense,not just focusing on cost efficiency to cut people, but that you can also give those people a better place within the company, that they can really go do what they're good at, you know. And that's not always sending out invoice reminders, let me put it that way.

00:06:55 Speaker B

No, no, exactly. Yeah. No, for sure. And "freeing up employees' time",I also don't mean that an employee then just has to do less. I see it more as that an employee can work more effectively within the same hours they're available. So yeah, often people talk negatively about that,like, if you need fewer people, then you can fire half of them.

People are often seen as a cost. But I see that differently. I think people can be deployed differently. I think people will also enjoy their work more. Because they can focus more on relevant things than on stuff that just takes time now.

00:07:42 Speaker A

Is that something you've noticed yourself? Or in your own experience?

00:07:48 Speaker B

Yeah, here's a good example. With the development of AI systems like ChatGPT or other AI models being used, I can indeed achieve much more in the same amount of time than before. I'm talking about writing content, debugging errors in a PHP function, getting advice on a piece of code that could work better on a website or could do what the client is asking for.

00:08:29 Speaker B

There are various things that are just much easier, much faster to solve thanks to AI. So those are definitely things we use in our field.

00:08:42 Speaker A

Okay, this model in front of you,how much do you think this model takes into account the scalability of RPA projects and their long-term sustainability? So does it seem like it's meant for a single case? Or that it could also be applied more generally at a strategic level,and if not, what could be added to make that possible?

00:09:04 Speaker B

Yeah, I do think that... that you have to look at it per case, like where do I see possible improvements with the RPA project. With one case it could be much more or less than with another. Because every organization is unique. You can't really place it one-to-one, I think.

But in broad strokes, I do believe it could bring improvements. But I think the piece I'm missing here is culture. I think you also have to be able to achieve a cultural shift within the organization. I think if you can achieve that, then this will go much easier and work much better.

You'll of course also run into situations where there's resistance from employees. Because they'll say, oh, something automated is being added to the work process. And then people often get that little alarm bell like, shit, maybe my job is gone in a year. Because that could all be replaced. Yeah, okay. Culture is of course very hard to... yeah, capture in a technical process. Yeah. But maybe you can name it next to or above the RPA project. That a positive culture toward the RPA project gives the RPA project a higher chance of success.

00:10:42 Speaker A

Yeah, exactly. And if you also include change management in that, that it actually turns out to be more of a positive than a negative. But okay, initially I can imagine that that might be a negative correlation block between the benefits. That it's not a benefit but a disadvantage for the work culture, indeed.

At least, in the beginning of an RPA project.

00:11:06 Speaker B

Yeah, I think that's a very important factor. Because if you get the people on board and they also understand where you want to go as a company, then they'll be much more willing to say, I get it and,actually,I'd like to learn it. And of course, it's then up to management to also respond to that.

Say, yeah, you know, we really want you to understand and learn and retrain for this. Because that way we can keep you. We don't want to get rid of you at all. We just want to work more efficiently. That's what we want. And then you go one step further. And I'm already thinking a step further: at the moment these kinds of processes are really well implemented in organizations and the company can achieve more with less, that they also give back the results to the people.

And then you can both produce more with less effort and divide the gains more fairly among people. The employees get the feeling like, look, we're also being rewarded for this transformation within the organization toward digital automation. And then they stay happy, and they stay with the organization, and they also continue to learn and develop.

00:12:12 Speaker A

Basically as an extension of,actually a benefit not yet mentioned I think,but if you approach it right, then it could even... That cost efficiency. Yeah, yeah, yeah, but also employee retention,so that the staff actually wants to stay with you.

00:12:28 Speaker B

Yeah, yeah, yeah, yeah, exactly.

00:12:32 Speaker A

That it's a cool company where I get to do fun things and I'm not just sending reminders or fixing broken links all day.

00:12:40 Speaker B

Exactly. The more we can automate processes, the more time I have to do other things. Within the same time frame.

00:12:48 Speaker A

And not just you, but also the staff. That's a nice segue. Are there sector-specific factors that could influence the applicability of this model? So, like for me in marketing or whatever,well, I don't know,maybe the box on the left-hand side, I don't really deal with that, or something is missing for my sector?

00:13:12 Speaker B

Well, yeah, I think that, what we just discussed, the employee satisfaction maybe, that could definitely be added, because yeah, in my field...

00:13:27 Speaker A

You're free to just write it down.

00:13:30 Speaker B

Then I'd look, maybe here. Add this. If you look at my field, of course you work a lot with people. So then it's the staff, the people you work with, that are very important. Making sure that if you have good people around you, that you keep them. Retention is also very important nowadays.

You see a lot of turnover. People often don't stay longer than 1 or 2 years with an employer before they leave again. You hear that a lot. I also hear it in my immediate circle. I don't know many friends or acquaintances who've worked at the same company for 12 years.

00:14:20 Speaker A

Yeah, more a thing from the generations before us, I think.

00:14:24 Speaker B

Yeah, for sure. My brother is six years older, but even he has changed jobs quite often. Yeah, it just happens. But also if I look at people I know, I also see that within the same year they switch jobs again.

Yeah, yesterday I was still talking to someone,a woman,who now works at a completely different organization than before. I always had contact with her. She used to work at a bicycle manufacturer and now she works at a childcare organization. So that's totally different. Yeah. But you know, maybe she worked there for, what, three or four years, something like that. And now she's here. Yeah well, it's nice that you maintain that relationship, because then she thinks of you and hopefully asks you again for some advice or whatever. So retaining client or employee satisfaction is very important. Yeah, that's also kind of a,

00:15:38 Speaker A

Nice transition to the next question I had. You've already kind of touched on it, but maybe there's more to add. How could the model better respond to intangible benefits, like employee satisfaction or innovation potential?

00:16:07 Speaker B

I'd call it "culture improvement." I would summarize that as engagement, employees, and also really giving them the feeling that they are valuable and really part of the organization. I see that as a key factor to making the RPA project more successful. Which would then result in higher employee satisfaction.

And if you have higher employee satisfaction, then you have people who are willing to always go the extra mile.

00:16:49 Speaker A

I think that's beautifully put.

00:16:50 Speaker B

And that translates all the way back, yeah, you know, it just benefits the organization as a whole. But it starts with that culture. Culture is very important. If you have a toxic culture...

00:17:06 Speaker A

Can you define that further?

00:17:08 Speaker B

Yeah, I can give a really good example. I'll speak again from the example of a good friend of mine who recently switched jobs, a few months ago. But now already came to the conclusion that this company absolutely doesn't suit him. And that has to do with how they treat their employees.

Very... controlling. To the extreme. That you sometimes get asked two or three times by the manager, "how's it going? how's it going?" and "how's it going?" What did you do earlier? What did you do this morning? And what are you doing this afternoon?

So really extreme, where you constantly have to look over your shoulder like, I can't do my thing like this. Everything I do is under a magnifying glass. I constantly have to justify myself, even though I'm in a management role. Which means, let me do my thing. You give me an assignment, let me do it.

I know what to do. But meanwhile someone is constantly on top of you wanting to know what you're doing. And that's toxic, because no one can keep that up.

You don't get the trust anymore to do what you're good at. And you start to feel like, I just have to do what he says. Or what she says. You know? That's not a healthy culture. And what do you get? People are no longer happy. They don't enjoy going to work anymore.

So yeah, I think that's just a good example of how not to do it.

But also with agreements,there are also situations where agreements are made top-down with you as an employee, and those agreements aren't upheld, then as an employee you also start to think, like, what are we doing here? This isn't okay either. We had a clear agreement. Of course it also goes the other way around.

But I'm now just speaking more from the perspective: how do you keep the employee satisfied? That's something I also hear a lot in practice.

00:19:19 Speaker A

Well, interesting. And what I really like about this interview is that there's suddenly a lot of attention for the cultural, human aspect. Then we can start wrapping up a bit. Do you think this model reflects the complexity of RPA implementation well, or are there areas where it's simplified or could be expanded?

For example, well yeah, back in the left-hand column, for example, you already have productivity, process hours, freeing up employee time,is it good that that's broken out like that, or could it be more compact, or maybe a bit in that corner... yeah.

00:19:54 Speaker B

Processing. Processing. I think all the aspects do come back in it.

00:20:31 Speaker A

Then the last chance. Is there anything else you'd want to add or other remarks on how this model could better reflect the benefits of RPA?

00:20:40 Speaker B

Yeah, I already wrote a few things down myself, so I think you might be able to do something with that. I think those intangible aspects, they're just really important. They should be a part of this, I think. To make the project more successful. Such an implementation.

00:21:04 Speaker A

Then the last content-related question. On a scale of 1 to 10,

00:21:08 Speaker B

What score would you give the model? I'd say a 7.5. There's some room for improvement. Then you can go toward an 8.5. A 10 is always an ideal model,I don't believe in that. But you can definitely score a lot better, and then you just have a super strong model.

00:21:33 Speaker A

Then I want to thank you for your time and especially for the valuable additions. I'm going to take this, along with a few other interviews, and synthesize them. That will give you a second iteration of the model. And I'll apply that model as a case at another company.

00:21:57 Speaker B

You're welcome.

Appendix L: RPA workflow chart

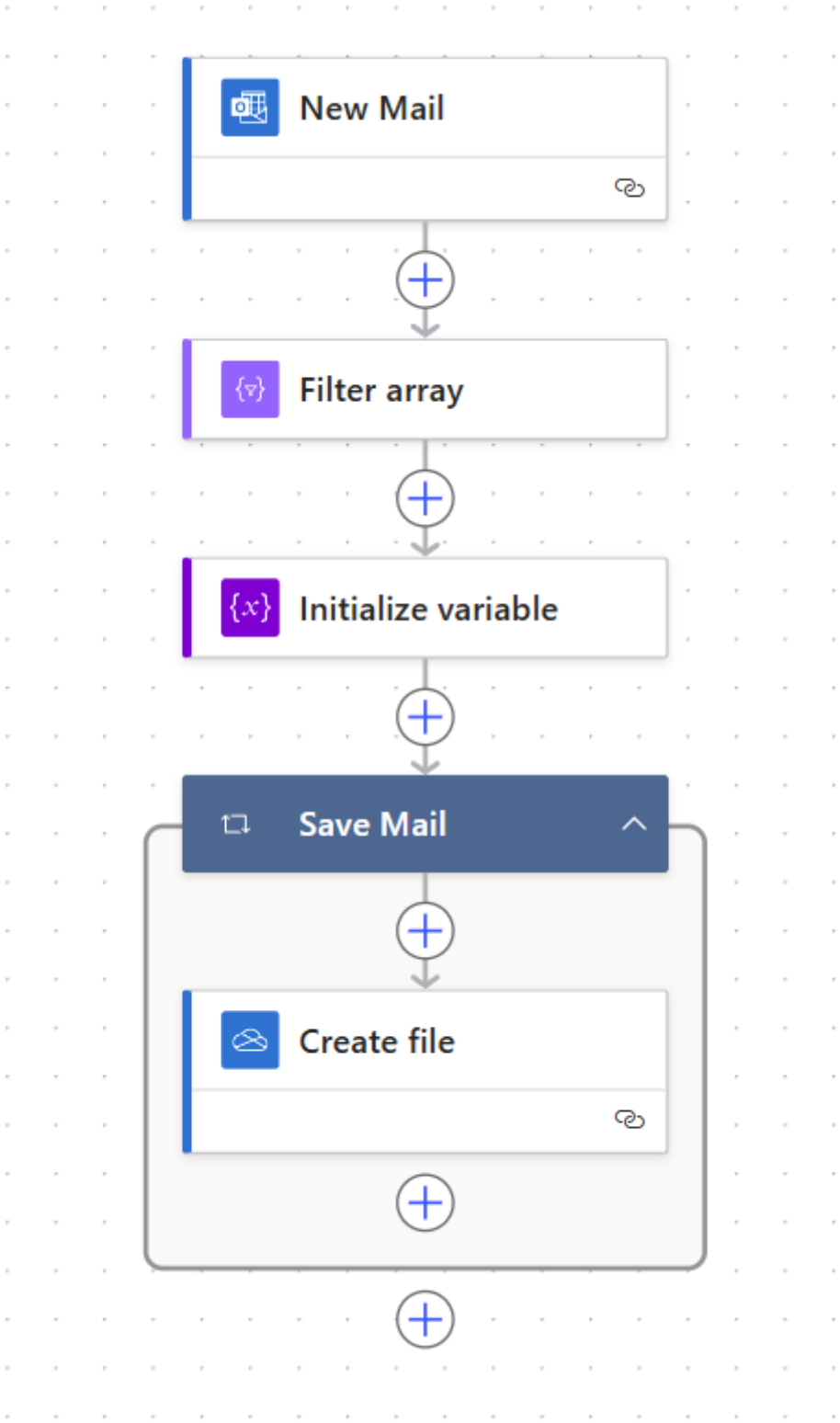


Figure 8 email retrieval workflow

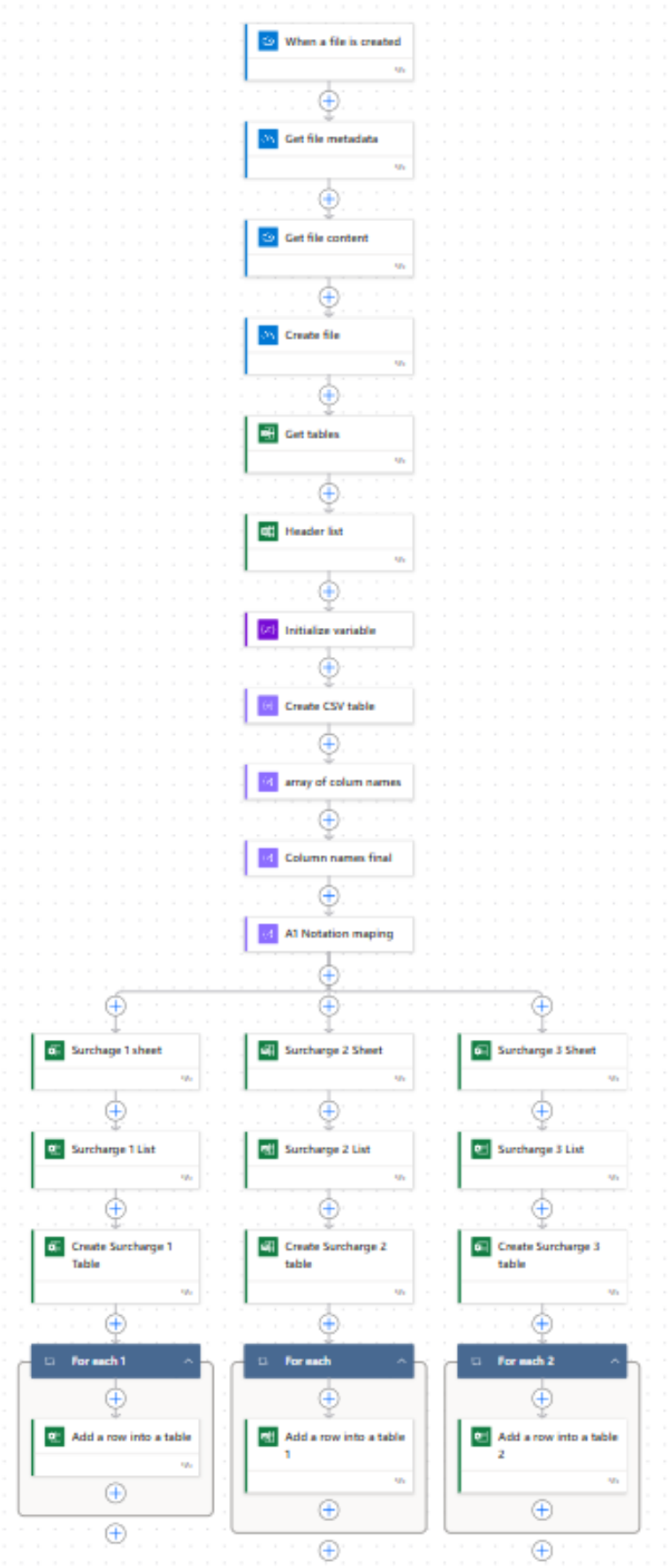


Figure 9 invoice analysis workflow

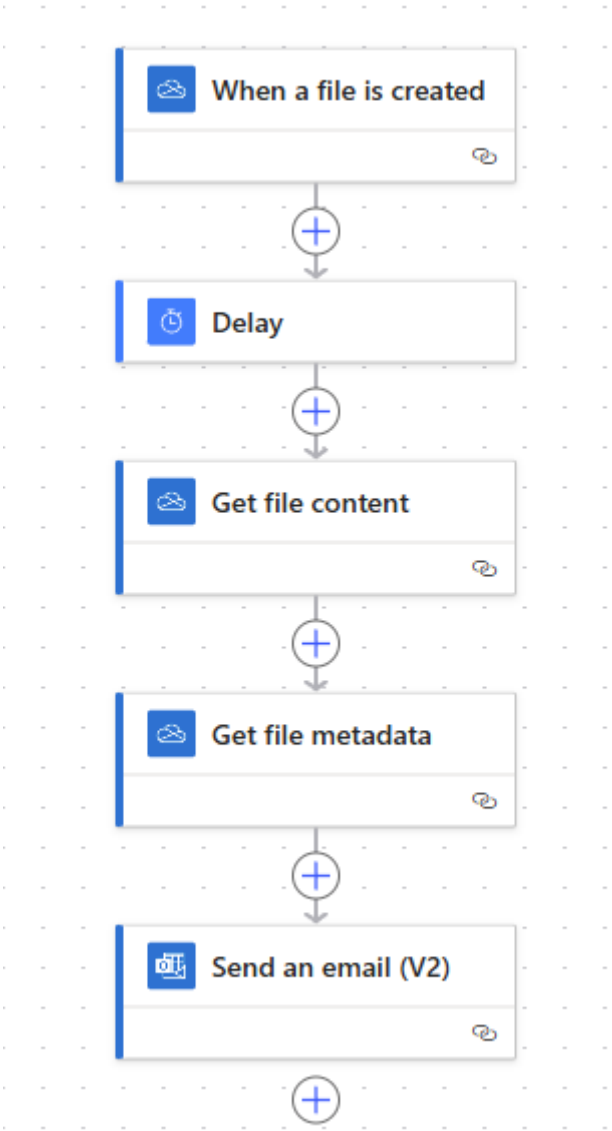


Figure 10 Send email workflow

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