From Hype to Reality: Navigating the Challenges of RPA Implementation

Stephen Treacy, Aishwarya Adyanthaya, Chloe Kearney, Jayesh Anand, Kieran O'Sullivan and Yue Xu
Cork University Business School, University College, Ireland

Stephen.treacy@ucc.ie
119220238@umail.ucc.ie
116432396@umail.ucc.ie
119221185@umail.ucc.ie
116782471@umail.ucc.ie
119220902@umail.ucc.ie

Abstract: The term Robotic Process Automation (RPA) was first utilised in 2012 (Hindle, 2018). The term began to gain traction in 2014 when businesses started to announce major savings because of automation. In early 2016, RPA back office automation became more significant but during this period it was still relatively limited (Willcocks & Lacity, 2016). From 2016 to 2017 the global RPA market increased by 64% (Fersht, 2017). They also reported a 42% increase in the global market for RPA between 2017 and 2018 and an anticipated increase of a further 94% between 2018 and 2021 (Fersht, 2017). The demand for RPA has increased using AI and software robots are expected to be the key drivers of growth. RPA continues to gather prominence throughout Europe as companies are eager to improve customer experience and to offer a streamlined service particularly for the financial services industry (Information Services Group, Inc., 2018). The key objective is to improve organizational performance and the customers' experience using an RPA solution. The RPA solution will enable the organization to provide around the clock robot assistance to the client, enhancing effectiveness and efficiency of the compliance process, faster return on investment (ROI), reduced processing time as well as helping to meet deadlines, improved quality with reduced human errors (Pattfaut and Borghoff, 2022). However, RPA is an extensive process and requires expertise in this space, structured input, and governance to achieve optimal implementation. The research objective of this investigation therefore is to explore methods for automating business processes while reducing operating costs and improving efficiency. In doing so, three research questions are presented: 1) What are the key phases in an RPA implementation?: 2) What activities are involved in each of the phases?; and 3) What should be the focus of each of these activities?

Keywords: Robotic process automation, innovation, development, performance, efficiency, scaling up

1. Introduction

Robot Process Automation (RPA) can be defined as "*a preconfigured software instance that uses business rules and predefined activity choreography to complete the autonomous execution of a combination of processes, activities, transactions, and tasks in one or more unrelated software systems to deliver a result or service with human exception management*" (IEEE Corporate Advisory Group, 2017). In recent years, RPA has emerged as a transformative technology, revolutionizing the way organizations operate by using software robots or "bots" to automate repetitive and rule-based tasks that were previously performed by humans (Lacity and Willcocks, 2017). This phenomenon has gained prominence due to advancements in artificial intelligence (AI) and machine learning (ML). The convergence of these technologies has led to the development of sophisticated software bots capable of emulating human actions. The earliest applications of RPA can be traced back to screen scraping and macros, but modern RPA solutions are far more advanced, incorporating AI and ML algorithms to handle complex tasks. Organizations across various sectors are embracing RPA to streamline their operations and drive efficiency, which has delivered several benefits (Soltani et al., 2017).

Firstly, RPA enables organizations to automate repetitive and time-consuming tasks, resulting in significant improvements in efficiency and cost reduction. By freeing up human resources from mundane activities, RPA allows employees to focus on more strategic and value-added tasks, leading to enhanced productivity (Müller et al., 2018). For example, routine data entry, invoice processing, and report generation can be automated through RPA, saving valuable time, and reducing error rates. Secondly, from the perspective of accuracy and compliance, RPA bots are designed to follow predefined rules and workflows consistently. This ensures a higher degree of accuracy, reducing the likelihood of errors. Moreover, RPA provides a robust audit trail, enhancing compliance and regulatory adherence for organizations operating in highly regulated industries. By automating tasks such as compliance reporting and data validation, organizations can minimize the risk of non-compliance and associated penalties. Thirdly, RPA allows organizations to scale operations rapidly without incurring

additional infrastructure costs, increasing organizational agility (Fernandes et al., 2019). Bots can be easily deployed and scaled up or down to accommodate fluctuations in workload. This flexibility enables organizations to adapt quickly to changing business demands and market conditions. For instance, during peak periods, RPA can handle increased transaction volumes efficiently, ensuring timely service delivery without the need for additional human resources.

1.1 Research Gap

RPA-based solutions are transforming business processes by delivering fast, accurate service, and improving the customer experience. Organizations are seeking to leverage the potential of RPA and provide better business and tech solutions (Bhaskar et al., 2021). More recently, industries are giving increased importance to automation as it is disrupting the current state of daily business processes, keeping well balanced with organizational drivers such as cost, productivity, and efficiency (da Silva Carvalho et al., 2021). We thus state our research questions as:

1) What are the key phases in an RPA implementation?

Understanding the key phases in an RPA implementation is vital for organizations planning to adopt this technology. RPA implementation involves a structured and systematic approach to ensure successful deployment and integration into existing processes. Identifying the key phases provides a roadmap for organizations and helps them allocate resources, plan timelines, and manage expectations. By studying these key phases, organizations can gain insights into the overall implementation process, allowing them to make informed decisions and develop strategies that align with their specific needs and goals.

2) What activities are involved in each of the phases?

Building on the first research question, the focus of this question addresses the activities involved in each of the phases of an RPA implementation, as this deeper level is crucial for organizations aiming to execute successful deployments. Each phase in the implementation process comprises specific activities that need to be executed to achieve the desired outcomes. By identifying and understanding the activities involved in each phase allows organizations to develop detailed implementation plans, allocate resources accordingly, and ensure smooth execution. It provides clarity on the tasks to be performed, the sequence in which they should be carried out, and the dependencies between activities. This knowledge can help organizations manage the implementation process more efficiently, minimize risks, and optimize the utilization of resources.

3) What should be the focus of each of these activities?

Going deeper still. the focus of each activity in the different phases of an RPA implementation is crucial for organizations to prioritize their efforts and allocate resources effectively. Each activity within a phase serves a specific purpose and contributes to the overall success of the implementation.

Decision makers need to appreciate the focus of each activity, and how they can determine the critical aspects that require attention and resources. It helps in defining clear objectives and key performance indicators for each activity, ensuring that they are aligned with the overall goals of the implementation. By identifying the focus areas, organizations can concentrate on mitigating risks, addressing potential challenges, and optimizing outcomes in each phase of the implementation process.

2. Methodology

This qualitative research study aims to develop a framework for RPA implementation in companies. Semi-structured interviews were selected for this study due to their flexibility and ability to uncover diverse perspectives, ideas, and themes related to RPA implementation. The semi-structured format allows the researcher to have a set of predetermined questions while also providing room for interviewees to discuss additional topics or ideas that they find relevant. This flexibility enables the exploration of emerging themes and in-depth understanding of the key phases, activities, and focus areas on RPA implementation. The interview responses can be further probed and clarified, ensuring a comprehensive examination of the research questions. Moreover, through semi-structured interviews, the researcher can capture not only the explicit information shared by interviewees but also their tacit knowledge, personal experiences, and insights that may not be readily apparent.

The inclusion strategy for selecting interviewees focused on eleven industry experts who possess existing knowledge and/or experience in managing RPA projects. These individuals were targeted professionals from organizations that have successfully implemented RPA or experts who have provided consultation and guidance in RPA deployments. By including these individuals, the study was designed to benefit from their practical insights, lessons learned, and expertise in navigating the challenges and complexities of RPA implementation. Their experiences and perspectives were considered vital to provide valuable input for developing the RPA implementation framework. Furthermore, the inclusion of industry experts ensures that the framework is grounded in real-world experiences and reflects the practical considerations and best practices.

While conducting data analysis, the process involved coding the emerging topics, themes, and ideas from the interviews to establish credibility and integrity of the findings. The researcher transcribed and analysed the interview data, identifying recurring patterns, ideas, and perspectives that emerged from the interviews, which were subsequently coded and categorized, facilitating a systematic analysis of the data. As per Mayring (2003), this involved three phases: summary, explication, and structuring. In the summary phase, the data was reduced to essential information by condensing and summarizing the key points, concepts, and themes. This phase allowed for a concise overview of the interview data. The explication phase involved seeking additional information and clarification through follow-up interviews or consultations with the interviewees or by referring to existing literature. This phase ensured a comprehensive understanding of the topics and themes identified, filling any gaps in knowledge and addressing any ambiguities. Finally, in the structuring phase, the most important aspects and insights were extracted from the data and organized into a coherent framework that outlines the key phases, activities, and focus areas of RPA implementation. This phase involved synthesizing the data and identifying the relationships between different themes and concepts to develop a comprehensive and practical framework for RPA implementation.

This approach to data analysis ensured rigor, transparency, and reliability in interpreting the content obtained from the interviews, leading to trustworthy and meaningful findings that can inform the key decision makers on the implementing RPA technologies. It also allows for a holistic understanding of the research questions and facilitates the identification of common patterns, challenges, and success factors in RPA implementation across various industry contexts.

3. Findings

This section will present the findings of the research, outlining the three research questions outlined previously, namely: the key areas, key activities, and the key focus of RPA implementation. These results are illustrated below in Figure 1.

Key Areas	Key Activities	Key Focus
1. Planning	*i. Understand current operations* *ii. Establish business case* *iii. Explore capabilities* *iv. Identify external variables* *v. Create project road map*	i. Select business case ii. Align stakeholders iii. Select tools iv. Identify skills required
2. Piloting	*i. Run pilot project for identified business case* *ii. Monitor performance*	i. Prioritize business processes ii. Develop infrastructure
3. Scaling-Up	*i. Refine strategy* *ii. Improve model*	i. Analyze lessons learned ii. Evolve RPA strategy and operating model
4. Steady-State	*i. Innovate*	i. Integrate design thinking ii. Establish culture of innovation

Figure 1: RPA Implementation Framework

3.1 Planning

Planning phase is the most important phase of the entire implementation journey as most of the activities are carried out in this phase. These are some key activities that will be carried out in the planning phase:

3.1.1 Understand Current Operations

For any organization, it is very important to understand the current state of their processes. By analysing the current state of the organizations process, organizations should identify processes which are the best suited for automation. After identifying the process(s), they should map out the current capabilities and outcomes. The

organization should also work towards the understanding of current automation technologies available and the possible outcome they can achieve. In short, this 3-way process can help a company to understand their capability maturity versus the outcomes. The gap between the current and the target state can then be easily seen. The execution path to fill the gap depends on multiple factors. In terms of the outcomes and the capability maturity of any organization, the outcomes can have an impact on business, operation, and cost.

Most interviewees agreed that because of COVID-19, organizations are going to have to switch to online learning instead of classroom type settings for increasing the shared knowledge throughout the firm. Although this is a new cost associated with resourcing as now eLearning modules will have to be created, deployed, and monitored. However, this method of learning will be far more cost-effective. *"In September, what we normally do with our system is classroom training, obviously classroom training can take place anywhere in the world but not anymore because of Covid-19 we are all working from home. So, now upskilling happens using eLearning platform which is cost effective*" (*E-11)*. While it is impossible to mitigate every risk for an organization, according to interviewees one of the most effective methods of reducing the risks within the organization is through upskilling and enhancing the shared knowledge throughout the company. *"It can be pretty difficult to overcome concerns without a level of shared knowledge. It's important to make sure everyone understands what's at stake and where the risks are and how best to mitigate this. This can be achieved through upskilling" (E-7).* Many interviewees conveyed the challenges associated with locating the resources required for RPA implementation. This can be seen as there is a lack of individuals available who have the necessary skillset for RPA implementation. Currently, organizations tend to hire those with a specific skill set or an individual who has specialised knowledge. This can ensure the reliability of the employees and their skills. *"Businesses try to find people who have a specific set of skills like if you have Salesforce experience then that will really help or if someone is specialised in all things UiPath" (E-8).* While most companies will require the basic technical skills, they are also actively seeking those who meet the technical requirements but also possess a good understanding of business. *"Having the basic technical skills is a requirement but then they should also have a good understanding of the business aspects" (E-7).*

3.1.2 Establish Business Case

After gaining an understanding of the current state and market capabilities i.e., deciding the current RPA capabilities and the desired business outcomes, the next step in the process would be to examine the use case for automation. The best-suited use case for the different levels of automation would provide great success. Based on the different use cases, there can be different states of automation. There are numerous automation options available with RPA or intelligent automation, and finding the right fit for different use cases is key. For example, invoice processing might consist of four major tasks: invoice data extraction, invoice exception handling, vendor account reconciliation, and vendor inquiry. Based on the different use cases, different states of automation can be applied, as outlined further below in Table 1.

Table 1: Use cases and related automation strategy options

Automation State	Description	Use Cases
State 1	No automation	First stage of business process where requirement gathering and business flows related to invoices have been analyzed and decided.
State 2	RPA	Email monitoring systems – Robotic processing and monitoring of a large number of emails 24/7. Whenever a new email arrives, the tool downloads the invoice attached to the email and stores for future reference.
State 3	RPA and Intelligent Data Processing (IDP)	Data extraction from the invoice – Building on the previous step, IDP can be used to digitize and extract data from invoice.
State 4	RPA, IDP, and Chat Bot	Handling enquiries from vendors – Chat bots can be used to handly queries from vendors and create tickets to assign to customer agent.
State 5	RPA, IDP, Chat Bot, AI	Analysis of payment pattern – AI can be used to handle any exception, with machine learning being used to analyze and predict vendor payment pattern.

Based on the interviews, it was found that most interviewees want to achieve a reduction in costs, greater efficiency, scalability, and regulatory compliance and perceive these as the main benefits of RPA. *"Currently, reducing operating costs, increase efficiency and speed are the key agenda for bank. To stay competitive and continuously available, we need a fast pace working environment, which can offer more advanced services" (E-7).* Many interviewees also expressed that staying competitive and ensuring continuous innovation is also very important to them currently. *"To stay innovative and competitive, Banks want to appear forward-thinking to*

customers. However, implementation of an RPA system depends on a lot of factors such as the ability of bank to adopt this new system, regulation and government concern over the system" (E-6).

3.1.3 Explore Capabilities

In order to carry out the RPA journey further, it is very important to understand the desired business capabilities and how they relate to the possible outcomes. After the completion of stage 1 and 2, at this stage of the journey, organizations must identify their journey component and associated key areas. Based on the data gathered throughout this investigation, an organization's capability can depends on these five key components: "Vision", "Implementation", "Technology", "Organization", and "Resourcing". Table 2 below will illustrate the key focus areas that need to be considered in order to achieve the right outcome.

Table 2: Organization's RPA

Capability Component	Description
Vision	• Understanding of an organization's vision towards RPA system. • Understanding of inherent challenges. • Ascertain organization's readiness in respect to process, risk and security.
Implementation	• Investigate scope and scale of RPA system to be adopted in less time • Conducting project feasibility and due diligence
Organization	• Establish governance model to implement RPA system among different teams • Analysis of management strategies for working culture in response to change
Technology	• Exploration of various aspects: i.e. how the bot should be developed, which advanced cognitive technology would be used in conjunction with RPA etc…
Resourcing	• Analyze current training programs and hiring practices to align with new processes

3.1.4 Identify External Variables

At this stage of the RPA journey, organizations should complete an assessment of all the factors that can affect the companies' target outcomes from RPA and the decided execution path to follow that target outcomes. The findings outline that variables can range from those directly impacted by the project, such as expected return on investment, capability to achieve desired state, and targeted outcome, to variables more specific to the nature of the project, such as the sensitivity to change, expertise required, risk management, people management and overall governance. If two different organizations take the same RPA journey who are at the same level of maturity and try to reach the same target goals, their execution path largely depends on their environment determinants. Hence, it is very important for organizations to have the best fit execution path to deliver target outcomes. Analysing all the RPA-related variables, allows organizations to create a successful execution plan.

3.1.5 Create Project Road Map

After finalising the best fit for the execution path, organizations can take advantage of a variety of tools and best practices to develop an execution strategy and follow along to achieve their target goals. The output of the execution plan and the entire road map depends on how cost and volume is mapped across automation potential factors. On one hand, where the cost and volume measures cost per transaction for the entire volume of the transaction in the year. On the other hand, the automation potential has been decided based on five main factors: process complexity, extent of digitisation, technology fragmentation, technology fragmentation, scale of operation, and existing process health. The execution plan will also include the process of choosing the best RPA tool. This is essential in terms of getting the best yield from an RPA strategy. Choosing an RPA tools depends on the companies' objectives and their automation requirements. Ten important guidelines emerged that should be followed when selecting the right RPA tool: ease of implementation, ease of use, speed, technical features, ownership cost, scalability, architecture, exceptional handling, vendor support, and governance.

One key finding from this category is the importance of leadership as one of the key challenges presented was communicating a problem to both the business team and the technical team. *"Banks now tend to have multi-disciplinary teams but there is still often a business team and a technical team. It can be challenging to communicate with both teams. Requires good leadership on both ends" (E-5).* A similar challenge was presented

in terms of many organizations' talent management strategies. Some interviewees suggested that such strategies should be continuously developed to ensure that potential employees with the appropriate and required skill sets are hired as it can be challenging to locate people with the necessary technical skills for RPA implementation and also have a good understanding of the necessary business jargon. *"Analyse the talent management strategies for working culture-related changes in organization" (E-10).*

3.2 Piloting

3.2.1 Run Pilot Project for Potential Business Case

To validate an RPA strategy and its guidelines, it is vital to run a pilot project for RPA implementation. This includes building a small end-to-end solution on the production environment. Exploring the practical aspect of any project saves organizations from any kind of risk that could happen in the future, or any kind of mismanagement associated past the initial stage. Knowing all the affecting factors and associated risks helps companies to solve them and meet the end goal successfully. At this stage, all the aligned stakeholders are involved and surveyed for proper feedback on the solution. Based on the feedback, challenges and risks that have been analysed proposed mitigation plan is set out. Feedback also helps to make the necessary changes in the methodologies and framework to deliver a stronger solution. Running pilot projects also helps organizations to identify the estimated budget for the entire solution, the RPA skills/resources that are required, the creation of the initial infrastructure, an analysis of the RPA vendors, an evaluation of the scripts/bot functions which can be tested against the initial solution design.

For example, several interviewees discussed their initial exploration of cognitive technologies in the form of chatbots. Such bots can be beneficial as they provide immediate customer support which can improve customer relationships. *"Using ML to automate customer support would be very cost effective for example using chatbots to answer the less critical questions" (E-5)*. Technical problems are a major risk for companies, and this can often make organizations reluctant to try new technologies. The employees within the organization and their response to changes in technology are typically not well received when it involves learning something new. *"Technical troubles tend to be a major risk" (E-3).* A similar issue that was also presented by the interviewees that organizations can sometimes be reluctant to admit when they do not have a good understanding or require technical assistance from third party vendors. According to the interviewees, this type of challenge is particularly seen in banks. *"…lack of understanding of technology. Banks are sometimes afraid to admit that they don't actually know how to implement RPA in addition to the government and regulatory concerns. This creates bottleneck while making use of RPA" (E-7).*

3.2.2 Monitor Performance

Monitoring the performance of the robots is one of the most important aspects of a project which focuses on the implementation journey of RPA. It is necessary to monitor the implementation of the robot to ensure that it is effective and successful at the task assigned. The performance of the project should be monitored using different KPIs across cost reduction, increased efficiency, improvement to quality, control, audit, and timeliness for each key process. *"While analysing risk factors, one potential risk factor would be business readiness including how much budget is planned, analysis of current infrastructure, availability of resources and so on" (E-6).* For other interviewees, the customer was the focus of everything they do. They respond to their customers' needs and demands to maximise customer satisfaction. This can help maintain a good customer relationship. *"The key directives would be to respond to customer's needs…." (E-5).*

3.3 Scaling Up

3.3.1 Refine Strategy

After measuring and evaluating all the key parameter indicators – Cost, Efficiency, and Quality, there would be a need for improvements in the RPA strategies once again. This depends on the type and the nature of the business processes in the firms. In order to meet the future business needs, being sustainable, and competitive, firms need to opt for technology that can be scalable. The RPA strategy mainly focuses on the company's current status and the factors that can impact business outcome of the process. For example, regulatory compliance is very important to companies within the financial services, given the nature of the data. Governing this data is becoming an increasingly difficult task particularly for the banking sector as they must maintain large quantities of personal information on their customers. It is the responsibility of the organization and its employees to

ensure that they operate in line with GDPR and CCPA regulations. *"Data is increasingly challenging as the quantity of unstructured data being inputted from sources has increased. This is important to consider so that bank can operate in line with GDPR and CCPA regulations" (E-5).* Due to COVID-19, many organizations are also turning to eLearning to increase the knowledge in the company. This is one method used by companies to mitigate potential risks to the organization such as regulatory compliance factors. *"...upskilling increases the knowledge in the firm. This will now be done through eLearning because of Covid-19…" (E-11).*

3.3.2 Improve Model

Six components emerged from the findings to describe the traditional RPA model, and how organizations can view the development of these projects through an iterative approach. Firstly, the need for effective strategy and governance emerged as being needed to define the overall vision and standard of the RPA at the organizational level. Understanding the vision at the early stages of this process can help organizations scale their target projects out faster. Secondly, the process life cycle itself must also be analysed for the identification and prioritization of different processes for automation. Recent development and maintenance to existing processes can also be considered here, while based on feedback from the piloting phase, there could also be some further project developments. Thirdly, value management is vital at this juncture to establish how the end result can be measured against the expected goal, i.e., how organizations are able to prove they are in a better position after the implementation of these technologies, than the organizations were before they had them at their disposal. Fourthly, decision makers must be able to align and change the various aspects of these processes at the different business levels for a successful implementation. Fifthly, in the pilot phase, the type of infrastructure and architecture needed for overall RPA journey is chosen.
While selecting RPA tools, it is important to understand whether the tool supports scalability or not.
Keeping the technology aspect in mind, all types of improvements can be made at this component of the operating model. Lastly, key decisions surrounding the enterprise integration should be discussed to ascertain the most similar functionalities and capabilities within the organization where the RPA project can be carried out at the same pace. This further raises the importance of better governance and overview of activities throughout the implementation process.

3.4 Steady State

3.4.1 Innovate

The main reason to go for RPA is to mimic the repetitive, time-consuming tasks meaning tasks that take a lot of time to complete and add less value to organisation. These tasks could be picked for automation and replace humans to complete such tasks using RPA bots. These bots can offer benefits in terms of consistency of business process. They can perform routine tasks the same as human and maintain a level of consistency every time based on defined captured flow. While enterprise-level software and applications are complex, they use a lot of different layers in the architecture and at each layer. In this kind of scenario, it is important to understand the breadth of access to RPA bots., and how they should offer interconnectivity with other software at different levels.

4. Discussion, Conclusions, and Implications

The objective of this research project was to create and develop a strategy to assist organizations in implementing RPA in various settings. Business processes for many back-office activities tend to be monotonous and time consuming, which can subsequently impact an organization's capacity for innovation and create an unpleasant customer service experience. This research has provided a strategic solution to overcome these problems by providing a framework that organizations can utilise when implementing RPA. The identification of four distinct phases, comprising of ten steps represents the main contributions of this paper, which outline a strategic blueprint for key decision makers to follow from a practical perspective. We contribute to the literature surrounding RPA by highlighting the importance of a structured approach when implementing these technologies, and in doing so, several managerial implications have also been presented. Firstly, this research serves to reinforce the strategic nature of implementing these technologies to aid existing business cases, and while this literature is still developing, this investigation advocates that key decision makers should not neglect the due diligence to ensure the overall success of the project. Secondly, our findings confirm that practitioners need to do more than simply identify potential use cases. There is an array of decisions to be made including the blend and reliance of technologies, in addition how these fit with the capability components outlined in the

findings (vision, implementation, organization, technology, and resourcing). Practitioners should recognise the potential value created through the development of structured approach to these projects, rather than considering them only to be supportive tools.

As with all research endeavours, this investigation has several limitations, chiefly among them the size of participants. For this exploratory investigation, eleven participants were interviewed and while this may present generalizability problems, the findings generated were able to provide an accurate representation of RPA project development across four distinct phases. While this study offers an initial insight to how successful projects may be implemented, future studies are now advised to develop this project map further, and to focus on specific technologies within the RPA paradigm. For example, cognitive technologies like AI, ML and Natural Language Processing can be combined with RPA to improve value propositions being sought.

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