# Project Management Methodology for Robotic Process Automation Implementation

Tessa van Leeuwen
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands
t.vanleeuwen-3@student.utwente.nl

## ABSTRACT

Robotic process automation (RPA) is an emerging and disruptive automation technology. However, a proper project management methodology for the implementation of this automation technology has not yet been developed. Therefore, this research will first identify the phases of a robotic process automation implementation project. Secondly, elements from existing project management methodologies will be analysed, to see if they are applicable for the implementation of robotic process automation. Thirdly, the success factors and action principles of the implementation of robotic process automation will be analysed. These findings from the literature form the foundation of the design of a methodology for RPA implementation. The designed methodology is validated by means of a case study.

## Keywords

Project management methodology, robotic process automation, RPA implementation, Design Science Research Methodology

## 1. INTRODUCTION

Robotic process automation (RPA) is an emerging technology that automates the tasks of humans. RPA can automate well-defined tasks by processing structured data and produce deterministic outcomes [15]. RPA aims to decrease the occurrence of human error and increase the efficiency of work execution.

This technology delivers value to the organisations that implement RPA according to consultancy companies [4, 6]. This claim is supported by various authors that have reported the benefits of implementing robotic process automation [18, 3]. However, robotic process automation lacks theoretical researches and conceptual frameworks [11]. Syed et al. support this statement. They found there to be a lack of consensus on what a methodology for RPA implementation should consist of [27]. EY, one of the biggest RPA consultancy companies, sees 30-50 percent of RPA implementation projects fail [6].

RPA is classified as a lightweight IT solution. Lightweight IT is non-invasive and front-end focused. Heavyweight IT on the other hand, is fully integrated and back-end focused [2]. Consulting company Deloitte found the implementation of RPA to be significantly different than of traditional IT implementations. Novel lightweight IT solutions, videlicet often clash with the organisational structure as this structure is designed for heavyweight IT solutions. The introduction of RPA is often hindered by the following two to issues [5].

First of all, heavyweight IT automation implementation is mostly governed by IT, whereas lightweight IT is often governed by business with limited involvement of IT. Nonetheless, IT support is still needed for tasks such as hosting or the security of the RPA solution. This calls for a continuous business and IT alignment within the organisation.

Secondly, traditional heavyweight IT solutions are generally rolled-out enterprise-wide as they influence other systems directly. Meanwhile, lightweight IT solutions such as RPA, can be implemented into one business process at the time. As a consequence, the visibility of the technology and its added value for the rest of the organisation is limited. This leads to less organisational support and acceptance of the RPA technology than of traditional heavyweight IT technologies.

The above described challenges lead to different needs for the management of RPA implementation project compared to traditional IT implementation projects. This research aims to develop a project management methodology for the implementation of RPA that can help overcome these organisational difficulties. In doing so, this paper seeks to assist organisations with a successful implementation of robotic process automation.

## 2. PROBLEM STATEMENT

Currently, there are no clearly defined project management methodologies for robotic process automation implementation in the literature [27]. Therefore, this research aims to develop a methodology for organisations wanting to implement robotic process automation.

This problem statement leads to the following research question.

- **RQ**: What project management methodology is useful for implementing robotic process automation in organisations?

In order to be able to specify how to properly manage a RPA implementation project, we need to define a project. The Project Management Vocabulary defines a project as follows: 'A unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific


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requirements, including constraints of time, cost and resources.' [28]

The objective of a RPA implementation project is a successful implementation of RPA in the business process. To develop a methodology that can support such successful implementation, it is important to determine which activities need to be executed and which principles should form the foundation of the coordination and control of these activities.

We start with determining the different phases of a RPA implementation process. The phases can be used to categorise the needed activities for the methodology.

- **SQ1**: What phases of RPA implementation projects can be specified?

Secondly, we will look what elements from commonly used project management methodologies may be suitable for RPA implementation projects.

- **SQ2**: What elements of commonly used project management methodologies are suitable for robotic process automation implementation projects?

Thirdly, it is essential to have a good understanding of the success factors and action principles for the implementation of RPA.

- **SQ3**: Which success factors and action principles for the implementation of robotic process automation have been specified?

The outcomes of SQ2 and SQ3 can be used to compose the principles that form the foundation of the coordination and the control of the phases found in SQ1.

# 3. BACKGROUND

## 3.1 Robotic Process Automation

Robotic process automation is the configuring of software to perform tasks previously done by humans. RPA is a set of tools or software programs that operate on the user interface of other application software systems in the way a human would do [14]. RPA can automate tasks that have clearly defined rules for processing structured data to produce deterministic outcomes [15]. A process is among other factors found to be suitable for RPA if it is standardised, has a rule-based structure, is conducted repetitively and manually by humans, and requires multi-system access [27]. The benefits of RPA are various, but an analysis of Ivancic et al. of 12 case studies found the following main benefits: increased efficiency, reducing human labor, employees can concentrate more on value creation, costs savings, ease of use, increased volume of performed tasks and, and increased quality of work [11].

## 3.2 Case study

The case company is a Dutch company in the Fast Moving Consumer Goods (FMCG) sector. This case study focuses on the automation of the route settlement process of domestic shipments of the logistics department with the use of RPA. There are four types of shipments that need route settlement.

- A delivery of goods and a return of emballage or goods from the same customer.
- A delivery of goods without a return of emballage or goods, but the truck does come back to the company.
- A delivery of goods without a return of emballage or goods, but the truck does not come back to the company (one-way).
- A delivery of goods to one customer and a return of emballage or goods from another customer.

The shipments are shipped with 14 assigned trucks from two different transport companies.

**Description of the process**

1. When leaving the logistics office, the truck driver takes a pre-filled delivery note and an empty printed return form.
2. The truck driver unloads the shipment at the customer and hands over a copy of the delivery note.
3. If necessary, the truck driver loads the truck with the emballage or return goods present.
4. The truck driver manually fills in the return form accordingly.
5. The truck driver returns the emballage or return goods to the company.
6. The truck driver hands in the delivery note and the filled in return form at the logistics office.
7. The inbound officer fills in the information on the delivery note and the return form manually into the SAP system.
8. Billing of the delivery and return is done by the finance department.
9. The return of full goods and mistakes made in the route settlement process are handled by customer service.
10. Missing delivery notes or return forms are located by the in-house planner.

The process is highly standardised and well documented, has a rule-based structure, is currently conducted receptively by humans, and requires multi-system access. Hence, this process fulfills the requirements for suitability for RPA described in 3.1.

# 4. RELATED WORK

Various papers can be found on RPA itself [25, 21, 30]. However, L. Ivancic et al. state that the full research potential of RPA has not been achieved yet [11]. Syed et al. describe the contemporary themes and challenges for further research in this field: the measurement of RPA benefits, RPA readiness, capabilities of RPA, RPA technologies, and methodologies for RPA [27].

Lacity and Willcocks [15] define a useful continuum of automation tools ranging from robotic process automation (RPA) on the one end to cognitive automation (CA) on the other.

Several case studies have been performed on the added value of RPA deployment within organisations [29, 7, 19]. These case studies resulted in action principles and success factors for RPA projects. Lacity et al. [16] found 39 action principles for effective implementation of RPA that are

based upon 22 case studies. Miller [23] provides a list of 70 success factors for artificial intelligence projects.

Research on the effects of automation on humans already started more than 20 years ago [24]. Recently, research has also been conducted on the views of different stakeholders on automation projects. Lindgren et al. [19] provide an overview of the different views of stakeholders on the expected outcomes of RPA implementation within a Swedish municipality. The research on stakeholders and automation projects mostly focuses on internal stakeholders. Langer and Landers [17] conducted research on the effects of automation on external stakeholders, but this research mainly focused on decision automation.

# 5. METHODS OF RESEARCH

## 5.1 Development of the methodology

A project management methodology will be developed using the Design Science Research Methodology [31]. This methodology consists of 5 sequential steps. First, the initial problem needs to be explicated. Hence, the need for a project management approach for RPA implementation projects is backed by literature. Secondly, requirements for the methodology need to be defined. The requirements will be drawn up based on the categories of critical success factors for project success [13].

During the third step, the project management methodology will be designed based on a review of relevant literature. The design will take the identified phases of RPA projects as a basis (SQ1). The methodology will be elaborated with the applicable elements from the Waterfall, Agile and Prince2 project management methodologies (SQ2), and the identified success factors and action principles of RPA implementation (SQ3). After the development, the methodology can be demonstrated using the route settlement case (step 4). This demonstration of the methodology and the requirements found in step 2 are used to evaluate the methodology in relation to the case study (step 5). A visualisation of the Design Science Research Methodology can be found in 'Appendix A".

## 5.2 Literature review

A literature review will be performed to answer SQ1, SQ2, and SQ3. The outcomes will be used as the foundation for the to-be designed methodology. The papers for the literature review will be searched for through systematic literature searches. For each of the sub-questions, an initial search will be done on Scopus using the queries displayed below.

- **SQ1: ("robotic process automation" OR rpa ) AND ( framework OR "implementation plan" OR methodology)**
- **SQ2: ("robotic process automation" OR rpa ) AND ( "project management methodology" OR waterfall OR prince2 OR agile )**
- **SQ3: ("robotic process aumation" OR rpa ) AND ( "critical success factor" OR "action principle" )**

Each query will search for the specified terms in the title, keywords, and abstract. The following inclusion criteria will be applied to the found documents after reading the title and abstract.

- Project management of robotic process automation projects needs to be one of the main focuses of the document.
- Peer-reviewed Journal or Conference.

The documents that were not filtered out will be used for backward searches. The found documents using these searches will also need to fulfill the inclusion criteria.

## 5.3 Case Study

The most important internal and external stakeholders of the route settlement case will be interviewed to illustrate and validate the designed methodology. The internal stakeholders come from all the different layers of the organisation. These interviews will focus on their interests, needs, and hesitations regarding the implementation of RPA in their organisation.

The following internal actors will be interviewed as they are directly or indirectly connected to the route settlement process: manager Warehouse and Distribution, the team leader Forwarding and Shipping, an inbound officer, a transport planner, a customer service employee, and a truck driver.

Moreover, external stakeholders from the daughter company and customer of the case company will be interviewed about the effects the implementation might have on their workflow and their relationship with the case company.

The interviews will be semi-structured. A set of questions will be prepared in advance, but additional questions will be added during the interview themselves. There will be a preference for face-to-face interviews if the COVID-19 situation allows so.

# 6. LITERATURE REVIEW

## 6.1 Phases of RPA implementation projects

**Table 1. Identified phases of the RPA implementation process**

| | **F. Huang et al. (2019)** | **L. Herm et al. (2020)** |
|---|---|---|
| *(1) Identification* | | x |
| *(2) Screening of technologies* | | x |
| *(3) Business strategy alignment* | | x |
| *(4) Process selection* | x | x |
| *(5) Software selection* | | x |
| *(6) Procedure modification* | x | |
| *(7) Implementation* | x | x |
| *(8) Evaluation* | x | |
| *(9) RPA roll-out* | x | x |
| *(10) Adaption and scaling* | | x |

The literature search described in 5.2 resulted in 2 documents. Table 1 provides an overview of the identified phases and their coverage in the found literature. The found phases can be defined as follows.

1. *Identification*: Identification of the need for process automation [8].
2. *Screening of technologies*: Screening of potential automation techniques [8].
3. *Business strategy alignment*: Check alignment of a potential RPA implementation with the business strategy [8].

4. *Process selection*: Identification of processes that are suitable for RPA based on several relevant process attributes. [10, 8]
5. *Software selection*: Selection of suitable software for the automation [8].
6. *Procedure modification*: Modification of the to-be automated process to prepare for the RPA implementation [10].
7. *Implementation*: Development of a RPA library –Extension by the RPA team, software licenses, etc. [10, 8].
8. *Evaluation*: Evaluation of the performance of the RPA bot(s) through testing [10].
9. *Roll-out*: Implementation of the software bot(s) in the process flow [10, 8].
10. *Adaption and scaling*: An extension of the RPA portfolio [8].

**Conclusion**
There are different divisions for the phases of RPA implementation projects in the literature. The phases process selection, implementation and RPA roll-out are found in both documents.

## 6.2 Suitability existing project management methodologies for RPA projects

**Table 2. Coverage project management methodologies and RPA projects**

| | Waterfall | Agile | Prince2 |
|---|---|---|---|
| Y. Ma et al. (2019) | x | x | |
| P. Hofmann et al. (2019) | | x | |
| H. Angermann (2020) | | x | |
| M. Kirchmer et al. (2019) | | x | |
| J. Marek et al. (2019) | | x | |

The literature search described in 5.2 resulted in 5 documents. Table 2 provides an overview of the coverage of the use of the Agile, Prince2 and Waterfall methodologies for RPA implementation projects in the literature.

**Waterfall**
The found literature about the use of Waterfall based methodologies for automation projects is scarce. The paper that was found is rather negative. Y. Ma et al. suggest that the Waterfall methodology should be avoided since it lacks user feedback and is therefore prone to high development costs [20].

**Agile**
All the found documents discuss the use of Agile components for the management of RPA implementation projects. The flexibility of Agile-based methodologies is seen as a good fit for the implementation of RPA. The reason for this good fit could be the innovative development culture of lightweight IT solutions such as RPA [2]. The following components of the Agile methodology were found to be suitable for RPA implementation projects.

- The importance of continuous user feedback in the development process is emphasised [20, 22].
- RPA use cases should be implemented in short iterations, also called sprints, to be able to respond to changing requirements [1].
- As the result of each iteration (a new minimum viable product) an intermediate to-be process should be developed to ensure appropriate change management [14].
- A motivated and responsible project team should be set up [22]. The literature also emphasises the importance of process owners[9].

**Prince2**
The found literature does not cover the use of the Prince2 methodology for RPA implementation projects. This might be due to the prescriptive character of the methodology. It could be argued that this does not work well in combination with the adaptability of RPA.

**Conclusion**
Several components of the Agile methodology are found to be suitable for RPA implementation projects. The traditional Waterfall should be avoided. The found literature does not cover the suitability of the Prince2 for RPA implementation projects.

## 6.3 RPA project success factors and action principles

The literature search described in 5.2 resulted in 2 documents. The found action principles are categorized based on the phases identified in 6.1 and an additional category 'stakeholder management'.

*Process selection*

- Automate the smallest percentage of tasks that account for the greatest volume of transactions to deliver the most business value [16].

*Software selection*

- Select a tool that does a few things well to ensure technical success [16].
- Use a controlled experiment to assess tools to select the tool that delivers the best financial value [16].

*Implementation*

- Select the best sourcing option to ensure the success of implementation [16, 32].
- Select the organisational unit that is best-suited to own the automation program to achieve the desired priority [16].
- Find the program champions who will overcome obstacles to ensure project implementation [16].
- Instructions should be explicit and have the appropriate amount of detail [16].

*RPA roll-out*

- Expect technical challenges as a first mover to minimize disappointments [16].

*Evaluation*

- Create a Center of Excellence (CoE) to disseminate the technology across the organisation [16].
- Integrate RPA and cognitive initiatives to deliver end-to-end service automation [16].
- Continually innovate to deliver value to customers, employees and shareholders [16].

*Adoption and Scaling*

- Ensure that the IT infrastructure grows in pace with the RPA scaling. [32].
- Reuse components to scale quickly and to reduce development costs [16].
- Multi-skill the robots to extract more business value [16].

*Stakeholder management*

- Gain c-suite support to legitimate, support and provide resources for the initiative (manage up) [16].
- Communicate the intend effect on jobs early in the process to employees (manage down) [16].
- Be transparent with customers (manage out) [16].
- Report financial savings as hours back to business instead of FTE savings [16].
- Redesign employee scorecards so that employees are credited with productivity gains contributed by their robot teammates [16].
- Manage expectations so that stakeholders expect the tools to be competent as new employees not as experts [16].

**Conclusion**

There are various action principles for RPA implementation defined in the literature. The found principles are applicable for the RPA implementation phases ranging from 'process selection' to 'adoption and scaling'.

# 7. PROJECT MANAGEMENT METHODOLOGY FOR RPA IMPLEMENTATION

## 7.1 Problem Identification and Motivation (Step 1)

The implementation of RPA as a lightweight IT solution in a heavyweight IT-focused traditional organisation poses challenges. The implementation calls for an ongoing alignment between business and IT departments within the organisation. Moreover, gaining support for the implementation might be difficult because of the limited visibility of RPA [5]. Other often encountered challenges conclude: an incomplete understanding of the automation technology and its potential use because of the novelty of the technology and a fear of job loss by employees [26].

A project management methodology that suits the needs to be able to overcome these challenges is not yet developed. According to the paper of Syed et al., there is currently no consensus of what a methodology for the implementation of RPA should look like [27].

Adherence to a project management methodology has a positive effect on the success rate of projects [12]. Currently, 30-50 percent of RPA implementation projects fail [6]. Therefore, there is proper foundation to assume that the development of a project management methodology for RPA implementation will improve the success rate of RPA implementation projects.

## 7.2 Objectives (Step 2)

In the previous step, the need for an implementation methodology for RPA has been made clear. The aim of this paper is to develop a successful RPA implementation methodology. The requirements for such a project management methodology can be drawn up using the success factors for a successful project [13].

- The methodology should have the sought-after *impact*: successful implementation of RPA in the organisation's process.
- The methodology should benefit the *efficiency* of the implementation process such that the business case can be met.
- The methodology should lead to *stakeholder satisfaction* regarding the implementation process.
- The methodology should entail *organisational benefits*: will the organisation learn from the implementation?
- The methodology should have *future potential*: facilitate and motivate the organisation for future projects.

## 7.3 Design (Step 3)

### 7.3.1 RPA Implementation Methodology

The designed RPA implementation methodology can be found in figure 1. The RPA implementation methodology consists of three iterative stages: process selection (1), the iterative cycle of implementation (2), and scaling (3). The cycle of implementation includes the following phases: project initiation, process preparation, software development, software roll-out and evaluation.

The following principles form the core of the methodology:

1. The principle of *user feedback*: the feedback of the future user of the system should be included in each phase of the implementation cycle.
2. Each iteration of the implementation cycle should result in a *minimum viable product*.
3. The principle of *open communication*: inform all relevant stakeholders of important decisions made and the possible consequences.

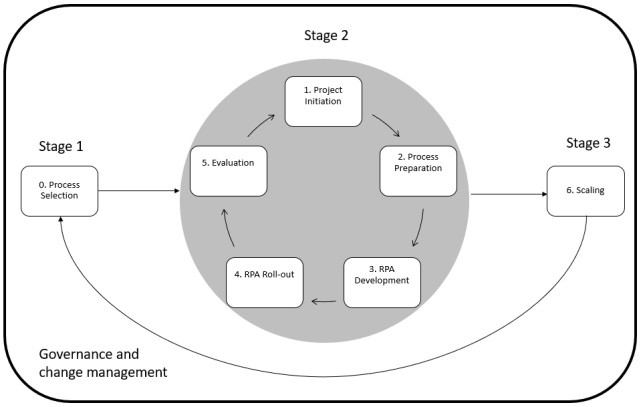


**Figure 1. Robotic Process Automation Implementation Methodology**

### 7.3.2 Stage 1

**0. Process selection**

In this phase a process will be chosen that is to be automated with the use of robotic process automation.

1. *Screening of potential processes* suitable for RPA implementation. The processes should fulfill or have the potential to fulfill the following requirements: standardisation, has a rule-based structure, is conducted repetitively and manually by humans, and requires multi-system access.

2. Ensuring the automation of these processes would be in line with the business strategy: *business strategy alignment*.

3. Analysing the *business cases* for each of these processes. In the formation of the business cases potential technologies and software packages can be explored. A valid business case is important to ensure support from the organisation's management.

4. *Process selection*: selecting a process that fulfills the RPA criteria, its automation is in line with the business strategy, and its automation has a promising business case. For this decision support from the management of the organisation is essential.

5. *Inform stakeholders* about the decision and its effects and benefits for their workflow to ensure support from the stakeholders.

### 7.3.3 Stage 2

**1. Project Initiation**
When a process has been selected it is important to initiate the implementation process in a proper way. The initiation phase consists of the following steps.

1. First of all *set up a motivated and responsible internal project team*. This team should at least consist of someone with expert knowledge about the to-be automated process, someone with relevant IT knowledge, and someone in a managerial position to ensure appropriate alignment between business and IT. Furthermore, it is advised to appoint a Center of Excellence (CoE) to gain and keep knowledge of RPA within the organisation. The employee(s) in this function should play a role in all the future RPA projects in the organisation.

2. The newly formed project team should *draw up concise project goals*. Business and IT focused goals should be weight up fairly. These project goals should be communicated as early on as possible to the involved stakeholders.

3. The next step is to *gather requirements* for the RPA implementation from the involved the stakeholders. Include both internal and external stakeholders.

4. When the goals and requirements of the automation are clear it is time to choose a *software package and a sourcing option*. When the essential expertise is not yet present in the organisation, it is advised to collaborate with a RPA consultant. Ideally, the pointed Center of Excellence will take over this position in the future.

**2. Process Preparation**
This phase prepares the process for the implementation of RPA.

1. If the process does not yet fulfill all the requirements for RPA implementation mentioned in phase 0, these requirements should be met first to ensure *maturity of the process*.

2. The next step is to check if the process is currently performed efficiently. Automating an inefficient process will not result in an optimal output. So if necessary the *process* should be *optimised*.

**3. RPA Development**
During the development phase, the software bot(s) are configured. The development phase consists of the following steps.

1. The *software* should be *configured* according to the found requirements in phase 1. Ensure that the instructions for the software bot are explicit and have the appropriate amount of detail. The development should work with sprints, with each sprint resulting in a new minimum viable product.

2. The configured software should be tested using *pilots*. Pilots deliver useful feedback as they mimic use cases for the software bot(s).

**4. RPA Roll-out**
During the roll-out phase, the software bot(s) will be introduced in the business. The roll-out phase consists of the following steps.

1. The *stakeholders* whose tasks or experience will change directly through the implementation of the software bot should be *informed* adequately about the changes in their work flow. Inform all the stakeholders that technical difficulties may arise during the roll-out to minimize disappointments.

2. Afterwards the software bot(s) can be implemented in the business process.

**5. Evaluation**
During the evaluation phase, it is decided whether another iteration of the implementation cycle will be carried out or if the project can move on to the scaling stage.

During this phase, the stakeholders should be asked the following question.

1. *Which automated aspects of this process can be improved?* Check if all the requirements are met or if new requirements have been found. This way continuous innovation is promoted.

If the stakeholders are not yet satisfied with the functioning of the software bot, a new iteration of the implementation cycle should be carried out. If satisfaction is achieved, the project can move on to the third stage: scaling.

### 7.3.4 Stage 3

**6. Scaling**
During the scaling phases, gained knowledge from the previous implementation cycle can improve future RPA implementation processes. The gained knowledge can help automate other aspects of the same process. Yet, this knowledge can help automate new processes as well.

First, the project team should reflect on the previous implementation cycle.

1. *What have we learned from the previously automated processes?*

Secondly, the project team should look on how to transfer this gained knowledge to other (sub)processes.

2. *How can we transfer this knowledge to other aspects of this process or other processes?*

Some components of the configuration might be reusable for other automation projects. If the maximum workload

of a software bot has not been reached yet, a software bot could also be configured to perform multiple tasks.

If the decision is made to transfer this knowledge to another process, the RPA implementation process will start at the first stage again at phase 0: process selection.

## 7.4 Demonstration (Step 4)

The methodology will be demonstrated by the route settlement case. A project plan is drawn up for the implementation of RPA in the route settlement process of the case company.

### *7.4.1 Stage 1*

**0. Process Selection**

1. The suitable processes in the logistical department of the case study company for RPA are: the route settlement process, the calculation of KPIs and the processing of stock counts.

2. The case study company wants to deliver the best service possible to their customers. The automation of these processes will most probably lead to higher customer satisfaction as the error rate of these processes will decrease. The automation would therefore be in line with the business strategy.

3. To illustrate this step, we will elaborate a simplified business case for the automation of the route settlement process. The team leader thinks that the automation would lead to 0.5 FTE back to business. We assume that delivers the company an investment of 0.5 x 50.000 euro = 25.000 euro for their company. The licensing of software would cost around 5.000 euro a year. Say that the development would be in-house and would take an employee of the IT department 2 months of full-time work for a salary of 80.000 euro. That would be around 13.000 euro. That would make 18.000 euro of costs together. In that case, there would be 7.000 euro left for other development costs for the ROI to be within the year. The business case is therefore valid.

4. The manager and the team leader find the route settlement process the most promising to automate. However, the support of the management of the umbrella company still needs to be achieved to ensure enough financial resources. A lack of financial resources has been mentioned as an expected pitfall by the inbound officer and the logistical planner. The employees whose workflow might change conclude of: the inbound officers, customer service employees and the logistical planner. They should be informed about the decision. The most frequently mentioned pitfall by the interviewees was an inadequate support base from the employees (manager, team leader, planner). To prevent this issue, transparent communication and proper change management were mentioned (manager, planner).

### *7.4.2 Stage 2*

**1. Project Initiation**

1. The project team for this automation project would consist of the manager of the Warehouse and Distribution department, the team leader Forwarding and Shipping, an inbound officer, an IT employee and a manager of the partnering transport company.

2. The overall project goal would be formulated as follows: a successful automation of the manual steps of the route settlement process.

3. The stakeholders that were interviewed for this case study should be asked for requirements during this phase. Additionally, the following departments should be involved as well: Customer Service, Finance, Sales, and Supply Chain Planning.

   An example of a requirement gathered from the interviews is: the RPA bot should be compatible with the SAP system.

4. The case study company does not have its own IT department, but relies on the IT department of the umbrella organisation they are part of. The team leader assumes there is currently no advanced knowledge within this IT department of the RPA technology, but that the department has a good potential to attain this knowledge. Since this would be the first RPA implementation in their organisation, it is advised to collaborate with a RPA consultant to decide on the software package and the sourcing option.

**2. Process Preparation**

1. The route settlement is currently partially done on paper. Thus, the process needs to be digitised before the RPA implementation. This could be done by implementing a digital return form on the board computer of the trucks. The digitisation of this processes asks for investment regarding time and budget. This influences the ROI of the RPA process which could lead to less support from management.

2. There is no uniform procedure of handling the route settlement process at each customer. Therefore, the development of such a procedure would further optimise the route settlement process. This should ideally be done before the RPA development phase.

**3. RPA Development**

1. The RPA bots would be configured by the IT department of the umbrella organisation under guidance of the composed project team using sprints. The requirements will form the basis of the configuration.

   The inbound officer and team leader foresee a difficulty to enable the software bot to handle exceptional cases. This might hinder the configuration of the software.

2. The RPA bot can be tested using pilots. Most of the employees of the logistics department (in-bound officer, planner, truck driver etc.) and the managers of related departments (Customer Service, Finance etc.) should be informed about these pilots and asked for user feedback afterwards. Thoroughly testing the software bot is supported by the customer service employee.

**4. RPA Roll-out**

1. The same employees should be informed about the roll-out as in step 3.2. This step is supported by the interviewed customer service employee.

2. The software bot can be implemented into the route settlement process.

**5. Evaluation**

1. The project team should analyse if the employees of the logistics department, the employees of related departments and the customers are satisfied with the functioning of the software bot. If all the requirements are fulfilled, the implementation process can advance to the third stage. If not, the process will do another iteration of the implementation cycle.

### 7.4.3 Stage 3

**6. Scaling**

1. The project team should evaluate the implementation process.

2. It should be investigated if related processes to the route settlement process, such as the route settlement of foreign shipments or the return of emballage to the suppliers, can be automated by reusing elements of the configuration of this software bot.

## 7.5 Evaluation (Step 5)

The evaluation of the project management methodology will be based on the five requirements drawn up in step 2. These requirements conclude: impact, efficiency, stakeholder satisfaction, organisational benefits, and future potential. The information for this evaluation is gathered through interviews with the different stakeholders of the case study company.

**Impact**
Both the manager and the team leader agree that a successful RPA implementation can be achieved using the designed Robot Process Automation Implementation Methodology. The manager supports the design choice of using two iterative processes.

**Efficiency**
During the demonstration of the methodology, the team leader brought up that it would be beneficial to have a manager of the partnered transport company in the project team, because of the need for digitisation of the process in phase 2.

This brought up the discussion of whether the process preparation phase is currently in the right stage of the implementation methodology. It can be argued that the process preparation is not a phase of the iterative implementation cycle, but a condition that needs to be met before this cycle can even start. The process preparation phase should then be located after the process selection phase in stage 1. This version of the RPA Implementation Methodology is displayed in figure 2.

The manager stated that generally speaking within their organisation smaller projects like these should pay themselves back within one year. It is therefore essential that the implementation cycle is short enough to be able to reach the payback point in this time frame. However, because of the needed steps in phase 2 of the methodology: process preparation this might not be realistic.

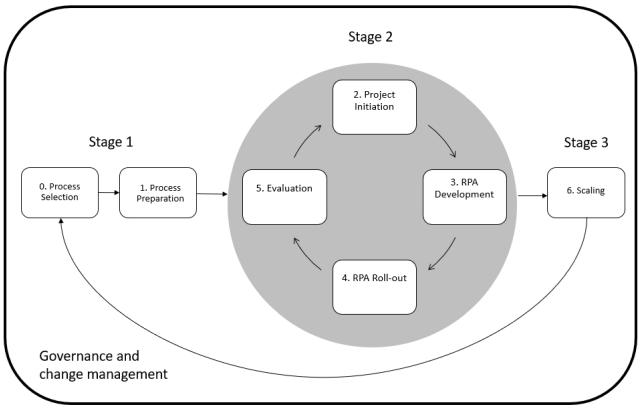


**Figure 2. Adopted Version Robotic Process Automation Implementation Methodology**

**Stakeholder satisfaction**
The manager and the team leader view the methodology as transparent. They support the early involvement of the stakeholders in the gathering of requirements and the frequency of user feedback. It lies within their expectation that this approach will have a positive impact on the stance of their employees regarding the implementation of RPA. The wish for transparent communication was mentioned by the customer service employee and the inbound officer as well. The daughter company and customer of the case study company did not care much for transparency as long as the implementation would not negatively influence their workflow.

**Organisational benefits**
The iterative character of the methodology asks for frequent evaluation of the implementation process. Lessons learned from the implementation process could be used in other departments of the organisation, in their daughter organisation, or in other organisations that are part of the same umbrella organisation.

**Future potential**
Implementation of RPA should enable employees to focus more on the more challenging parts of their jobs. All the interviewees saw this as a benefit of the implementation. The clear benefits for the stakeholders could work as the primitive motive for future RPA projects.

# 8. CONCLUSION

This paper proposes a project management methodology for the implementation of robotic process automation in organisations. The methodology is based on the identified phases of RPA implementation, suitable elements from the Agile methodology and action principles that were found in the literature. The methodology is validated by means of a project plan for the automation of the route settlement case. The evaluation is largely positive, but some critical remarks have been made on account of the efficiency of the methodology. All in all, the designed Robotic Process Automation Implementation Methodology is found useful for the implementation of RPA in organisations.

# 9. DISCUSSION

## 9.1 Limitations

The systematic literature searches for the literature study for SQ1 and SQ3 both resulted in an output of two documents. However, in most case studies about RPA implementation information can be found about the project phases or project success factors. The analysed documents did use some of these case studies as their sources, but there are no case studies directly used within these literature studies.

The designed project management methodology is illustrated and validated by the route settlement case. Due to availability issues, it was not possible to interview a truck driver. This limits the validation of the methodology. Additionally, due to time constraints, the methodology could not be evaluated after a full RPA implementation.

The research also made no distinction between RPA implementation projects within organisations of different sizes, in different sectors or from different countries.

## 9.2 Future work

Due to the above-described limitations, the recommendations for future work include the recommendation to further validate the design choices made for the development

of the project management methodology. The proposed adaptations during the evaluation should be validated as well. Additionally, the literature studies of SQ1 and SQ3 could be revised to validate the outcomes.

Another recommendation would be exploring the adaption of the project management methodology for the implementation of more intelligent automation technologies such as cognitive automation. Such automation technologies are often implemented in combination with RPA. Thus it would be relevant to research the needed adaptions for this project management methodology to also be of use for intelligent automation technologies.

Moreover, it could be explored whether the methodology could be useful for the implementation of other lightweight IT solutions as well. The implementation of other lightweight IT solutions can after-all be challenged by the same issues as RPA.

## 10. ACKNOWLEDGEMENTS

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# APPENDIX

## A. DESIGN RESEARCH METHODOLOGY

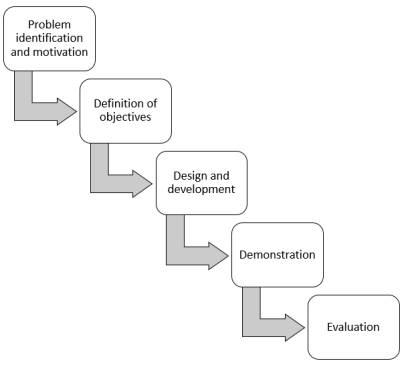


**Figure 3. Visualisation Design Science Research Methodology**