MASTER THESIS

IMPLEMENTATION OF ROBOTIC PROCESS AUTOMATION (RPA)

A qualitative case study into the way organizational actors give and make sense of the implementation process.

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Abstract

In recent years technological tools have been changing the way organizations operate intensely. One of these technological tools is Robotic Process Automation (RPA). RPA is a relatively new technology that is used for process automation for processes that were previously done manually by employees. Previous research points out that RPA is easier and quicker to implement than traditional IT solutions. However, little is known about the way organizational actors understand and give sense to the implementation of RPA. As prior literature has been researching the unfolding of change in organizations as processes of sensemaking and sensegiving, the purpose of this research is to understand the way RPA implementation unfolds by exploring the way organizational actors give and make sense of RPA during the implementation process through the sensemaking lens. This research is conducted as a qualitative, in-depth case study at a financial services firm in The Netherlands. Data collection was realized using a qualitative approach through semi-structured interviews and questionnaires with open-ended questions, resulting in 42 respondents (22 interviewees and 20 questionnaire respondents). The findings provide valuable insights on how sensemaking and sensegiving efforts by organizational actors unfold the way RPA is implemented at the case study organization. By linking the sensemaking lens with the Normalization Process Theory (NPT), It is found that the sensemaking and sensegiving practices while implementing RPA through the four dimensions (coherence, cognitive participation, collective action, reflexive monitoring) are occurring concurrently. This study demonstrates various sensemaking and sensegiving efforts by organizational actors that were important to stimulate the implementation of RPA. Some of the key insights of this study is the way organizational actors gave and made sense of RPA during the implementation process by personification of RPA, the bottom-up sensegiving approach, promotion of RPA by celebrating successes, and the integration of Lean management with RPA implementation. The results of this research allow organizational actors to understand how the RPA implementation process can be understood and how facilitating mechanisms can be supported by the organization in supporting and stimulating RPA implementation.

Keywords

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1. Introduction

Nowadays, digitalization changes the way organizations operate intensely. New technological tools allow the transformation of processes to become more efficient and improve the quality of work (Kirchmer, 2017). To remain competitive, companies need to constantly search for ways to improve their business processes, in which Information Technologies (IT) plays a crucial role (Syed et al., 2019). One of the digital enablers is Robotic Process Automation (RPA) (Kirchmer, 2017). The term "Robotic Process Automation" is relatively new and has gained a great deal of interest in Google Search Trends over a relatively short period as visualised in figure 1.

Figure 1. Search term interest in RPA (Retrieved from Google Trends).

In RPA, Syed et al. (2020) state that robots "represent software agents capable of interacting with software systems by mimicking user actions, thus alleviating the workload of the human workforce". The Institute for Robotic Process Automation & Artificial Intelligence describes RPA as "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" (IRPA AI, 2020). The term RPA does not refer to physical robots, but to software 'robots', making it a software-based solution to automate specific processes previously done by employees (Willcocks, Lacity, & Craig, 2015). Syed et al. (2020) mention that tasks that RPA perform are mostly simple, structured, and recurring, like automated email query's and collation of pay roll data from different sources. Organizations that have successfully adopted RPA have experienced significant savings on full-time equivalent (FTE), and RPA adoption has also positively impacted an organization's strategic goals and productivity (Lacity & Willcocks, 2016). According to Forrester, the RPA market will reach $2,9 billion by 2021, while only $250 million in 2016 (Le Clair, Cullen, & King, 2017). To illustrate, Fernandez and Aman (2018) mention that 54% of traditional financial services firms such as banks and investment firms are planning to increase their spending on RPA technology.

However, implementing RPA presents a challenge for many organizations as they struggle to understand how to implement it successfully (Deckard, 2018). According to a report of Ernst & Young, as many as 30% to 50% of initial RPA projects fail (EY, 2016). However, RPA is a relatively new technology, and the tasks that the software robots perform are typically simple, structured, and recurring, a lot of doubt remains about how RPA embodies

organizations and how organizations can successfully apply RPA (Syed et al., 2020). Syed et al. (2020) also stress the point that RPA vendors and consultants may provide biased information for the selection and implementation of RPA solutions. Besides the uncertainty around RPA and the potentially biased information from RPA vendors, there are also negative impacts that may be encountered as a result of using new technologies. An example is employee retrenchments, that may impact to motivation and employees' emotion as well as the productivity of the employee (Fernandez, Zainol, & Ahmad, 2017).

While many organizations see innovations as a good strategy to gain superior performance, the successful implementation of corporate innovation remain quite intangible for most of the organizations (Kuratsko, Covin, & Hornsby, 2014). This also relates to the findings described above, reporting as many as 30% to 50% of initial RPA projects to fail. To understand why certain RPA projects fail, we need to understand when a RPA project is successfully implemented. Klein and Sorra (1996) define implementation as a process, in which implementation is understood as a "transition period during which targeted organizational members ideally become increasingly skillful, consistent, and committed in their use of an innovation" (p. 1057). They mention that implementation is a process that starts with the decision to adopt an innovation and goes until the usage of the innovation is routinized in the organization. Moreover, Trullen, Bos-Nehles, and Valverde (2020) describe that implementation is effective when relevant organizational actors use the implemented practice or policy "consistenly, skillfully, and in ways that are congruent with its original purpose, even if the policy or practice has been modified during the implementation process" (p. 158). It is therefore important to understand that implementation is a process with various organizational actors involved and that it is effective when it is consistently and skillfully used with the original purpose.

Changes in organizations due to the implementation of innovation can bring both planned and unintentional results (Balogun & Johnson, 2004). The literature describes various reasons for the planned and unintentional results. One important reason that is often found in the literature is related with micro-level processes, for example the activities by organizational actors in subordinate levels of the organization (Bartunek, Rosseau, Rudolph, & DePalma, 2006; Johnson, Melin, & Whittington, 2003). What is particularly interesting regarding these micro-level processes, is the way organizational actors make sense of changes, thereby shaping the implementation process and change (Balogun & Johnson, 2004; Maitlis, 2005; Thomas, Clark, & Gioia, 1993).

Prior research has shown that sensemaking plays an important role in change in organizations, for example during implementation processes (Gioia & Chittipeddi, 1991; Gioia, Thomas, & Clark, 1994; Gioia & Thomas, 1996). This research adopts the sensemaking perspective to understand how organizational actors (or change recipients) understand, give, and make sense of the implementation process of RPA. Gioia and Chittipeddi (1991) first related sensemaking and sensegiving and showed that intentional processes of change triggers widespread sensemaking amongst organizational actors, specifically employees and (top)managers. In the theory of sensegiving and sensemaking, Kezar (2013) state that

"sensemaking is about creating an understanding of a change, and sensegiving is about influencing the outcomes, communicating thoughts about change to others, and gaining support" (p. 763). Various studies looked at middle management in sensemaking (Balogun & Johnson, 2004) and change recipient sensemaking (Balogun & Johnson, 2005). It can therefore be said that during implementation processes, organizational actors constantly substitute between the sensegiving and sensemaking of the implementation of a change. As implementation is defined as a process that starts with the decision to adopt an innovation until the adopted innovation is routinized (Klein & Sorra, 1996), understanding the way new innovations become routinized is important. To understand how implemented innovations unfold and become embedded, May and Finch (2009) describe the Normalization Process Theory as a framework for "analyzing the dynamic collective work and relationships in the implementation of new practices" (p. 549). The Normalization Process Theory can be closely linked to sensemaking and sensegiving as they can contribute to developing an understanding for and commitment to change among organizational actors in the implementation of Robotic Process Automation.

Summed up, the goal of this research is to investigate and explore how various organizational actors in an organization understand and make sense of RPA in the process of implementation. This paper thereby looks at the implementation process through the sensegiving and sensemaking lens. A sensemaking/sensegiving lens is useful for addressing the research question because it allows to get multiple in-depth perspectives on RPA, while capturing the understandings of RPA and how people use narratives to understand and influence RPA implementation. Since organizations struggle with the implementation of RPA (Deckard, 2018) and up to 50% of initial RPA projects fail (EY, 2016), it is worthwhile to explore how different actors in an organization understand and affect the implementation process of RPA. This research will aim to explore the implementation process of RPA with the lens of the sensemaking and sensegiving theory in a large organization with over 300 successfully initiated RPA projects. Hence, in order to research this, the following research question has been formulated:

"How do organizational actors give and make sense of Robotic Process Automation (RPA) in the process of RPA implementation?"

While RPA is rapidly growing, the study of RPA is largely limited and has little prior research since it is relatively new technology. This study is unique as it explores perspectives and experiences of different actors within an organization that implemented RPA rather than sharing the strategies given by consultants or executives. This study will contribute to literature, by aiming to understand how various organizational actors give and make sense to RPA and the changes its implementation brings forth to the workforce, for example how actors in an organization play a role in the social shaping and implementing of RPA. As sensemaking during changes plays an important role, an investigation of the implementation of this relatively new technology can be valuable to companies that are in the implementation

process of RPA, or companies that are willing the implement RPA in the future. This study will also have practical relevance for organizations, because it aims to unveil the socio-technical implications of RPA that might guide organizational RPA related policies and designs of effective change-management efforts. The outcome of this study could provide guidelines on sensemaking and sensegiving efforts related to creating a positive implementation climate from an organizational point of view. Furthermore, the identified skillsets which are seemed as highly important to implement and work with RPA can be taken into account when either hiring new or training current employees.

2. Literature

2.1 Robotic Process Automation

2.1.1 Background and definition of Robotic Process Automation

Robotic Process Automation has gained strong interest in the field of automation. Syed et al. (2020) states that RPA "amalgamates robotics, referring to software agents acting as human beings in system interactions, and process automation, i.e. work-flow management systems or, more generally, systems that are process-aware" (p. 1). RPA uses software and algorithms to automate human action in order to support efficient business processes (Lu, Li, Chen, Kim, & Serikawa, 2018). Instead of human labour for typing, clicking, and analysing data in different applications, a software robot is used where it is too expensive or too inefficient for humans to execute a task or a process (e.g. Asatiani & Penttinen, 2016; Lu et al., 2018).

RPA robots are combined with IT systems via front-end, as opposed to traditional software, which communicates with other IT systems via back-end (Asatiani & Penttinen, 2016). These robots use IT systems in a way a regular employee would also do, opposed to traditional IT systems that communicate with a system's Application Programming Interface (API) (Asatiani & Penttinen, 2016). Asatiani and Penttinen (2016) state that a lot of IT systems are registered without public API's, and this limits the possibility to connect to other systems. However, RPA provides a solution for this problem. Fung (2014) uses the term "information technology process automation (ITPA)" (p. 1) and states that the definitions of ITPA and RPA are similar. The paper of Fung (2014) has also been integrated by Asatiani and Penttinen's (2016) paper about RPA. Fung (2014, p. 1) defines ITPA as "IT capabilities that automate systems and network operational processes while interacting with elements like applications, databases and hardware infrastructure". However, ITPA is considered to be a term that covers wider range of use cases (Fung, 2014).

The processes that are automated through the use of RPA are easily modifiable. Asatiani and Penttinen (2016) mention that RPA robots are configured by modifying actions of a procedure done by an employee, making RPA very flexible to use and configure, as opposed to traditional IT software where advanced coding is needed to make modifications to a system (Asatiani & Penttinen, 2016).

Additionally, Devanney, Quilliam, DuVal, and Santos (2016) uses the term "Professional Services Automation (PSA)" and mention that PSA was a new trending topic in the business world in the early 2000s. RPA is seen most likely to be the future of automation through the use of robots (bots) (Devanney et al., 2016). Additionally, Devanney et al. (2016) classify the bots in three categories regarding complexity: task bots, meta bots, and IQ bots. Table 1 presents short descriptions of these categories.

Category	Description
Task bots	Used for repetitive tasks, though these bots can complete multiple processes. Task bots are mostly used in finance, accounting, and claims processing.
Meta bots	Used for complex processes that involves multiple skills.
IQ bots	Most advanced and capable of working with unstructured data. IQ bots are also proficient in decision-making through experience. These bots can think and learn and make less error than humans.

Table 1. Categories of software robots (Devanney et al., 2016)

An RPA robot can be programmed in a very short amount of time (Asatiani & Penttinen, 2016). Asatiani & Penttinen (2016) mention that setting up a RPA-robot might be as fast as 2 to 4 weeks and is significantly faster when comparing it to enterprise software integration that usually takes months to years. Current IT systems don't have to be changed to implement RPA, because robots imitate employee's behaviour (Asatiani & Penttinen, 2016). Robots can operate fully within the user interface (UI). This is a big advantage compared with automation achieved through back-end integration, which requires a great redesign of existing IT systems (Asatiani & Penttinen, 2016).

2.1.2 Benefits of RPA

The most common benefit that is mentioned by various studies is reduced operational cost, mostly in the measure of full-time equivalent of employees (FTEs) replaced by robots (e.g. Fung, 2014; Asatiani & Penttinen, 2016; Devanney et al., 2016; Willcocks & Lacity, 2016; Fernandez & Aman, 2018). Syed et al. (2019) describe four main themes regarding RPA benefits, namely: Operational efficiency, Quality of service, Implementation and integration, and Risk management and compliance.

Additionally, reduction of manual tasks (Lacity & Willcocks, 2018) and reduction of workload (Anagnoste, 2017) have led to time efficiencies with significant reductions (30% to 70%) in time for task handling, process cycle, and waiting (Lacity & Willcocks, 2016). The RPA robots can work for 24 hours a day, thereby improving productivity and freeing human resources from repetitive and boring tasks (Asatiani & Penttinen, 2016). Fung (2014) argues that employees may be participating in more value-adding work and improved decision making due to the implementation of RPA.

Moreover, improved quality of service is another benefit that is mentioned in literature. By using RPA, usual faults such as wrong data records or regular human errors are decreased (Lacity & Willcocks, 2016; Suri et al., 2017; Vanmali, 2017). Also, Lacity and Willcocks (2015) point out that RPA is easy and cheap to configure and maintain when comparing it to large enterprise systems. Lamberton, Brigo, and Hoy (2017) mentions another benefit of RPA, namely the increasing compliance. RPA software can keep a log of performed tasks to ensure that the processes that are being automated meet regulatory requirements

(Hallikainen, Bekkhus, & Pan, 2018). Figure 1 shows the benefits of RPA, as presented by Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, and Ahmed (2017).

Figure 1: Benefits of RPA (Rutaganda et al., 2017)

Figure 1: Benefits of RPA

2.1.3 Challenges of RPA

There are some challenges to RPA as well. Asatiani and Penttinen (2016) mention four challenges to RPA. First, although RPA is mentioned to be flexible and fast to implement, they argue it is still inferior to legacy IT systems as it might represent a temporary solution to automate manual processes. Second, as RPA is relatively new, it might need persuasion efforts to use RPA as a solution when comparing it with other solutions like outsourcing. Third challenge is the impact of RPA on current employees. Asatiani and Penttinen (2016) argue that employees could perceive RPA as their competitors and thereby build tension and potentially have a damaging influence on the confidence of an employee. Finally, RPA is appropriate for

specific processes that include only clearly described, rule-based work in which a subjective human judgement is not needed (Asatiani & Penttinen, 2016). Another important issue in the literature regarding RPA, is that according to Bygstad (2017), RPA is classified as 'lightweight IT'. Bygstad (2017) differentiates between a so-called 'heavyweight IT' and 'lightweight IT'. Heavyweight IT are the back-end systems that are mostly provided by IT divisions, like enterprise resource planning systems. The lightweight IT are front-end solutions that are supporting work processes (Bygstad, 2017). Bygstad (2017) argue that lightweight IT is cheap, easy, and configurable without IT specialists. However, important to note is that the two domains are also complementary. Bygstad (2017) state that "Lightweight IT is to a large degree dependent on heavyweight IT as a platform and as a data repository. The contrary is less obvious, but still true; heavyweight IT is dependent on lightweight IT for innovation and organizational agility (p. 4). Table 2 shows the differences of the various aspects between heavyweight IT and lightweight IT, as shown in the paper of Bygstad (2017). Lacity and Willcocks (2015) mention that RPA technology is functioning on top of existing systems without the need to create expensive platforms or systems, thereby classifying RPA as lightweight IT.

	Heavyweight IT	*Lightweight IT*
	A knowledge regime, driven by IT professionals, enabled by systematic specification and proven digital technology and realized through software engineering	A knowledge regime, driven by competent users' need for solutions, enabled by the consumerisation of digital technology and realized through innovation processes
Profile	Back-end: Supporting documentation of work	Front-end: Supporting work processes
Owner	IT department	Users and vendors
Systems	Transaction systems	Process support, apps, BI
Technology	PCs, servers, databases, integration technology	Tablets, electronic whiteboards, mobile phones
IT architecture	Fully integrated solutions, centralised or distributed	Non-invasive solutions, frequently meshworks (heterogeneous networks)
Development culture	Systematics, quality, security	Innovation, experimentation
Problems	Increasing complexity, rising costs	Isolated gadgets, security
Discourse	Software engineering	Business and practice innovation

Table 2. Heavyweight IT and lightweight IT (Bygstad, 2017).

2.2 Implementation process
2.2.1 Implementation definition

Trullen, Bos-Nehles, and Valverde (2020) argue that implementation processes at innovation, change, and strategy tend to involve a strong human component. The most used definition in the science of implementation is a process definition. Klein and Sorra (1996) define the implementation as a process definition, in which implementation is understood as a "transition period during which targeted organizational members ideally become increasingly skillful, consistent, and committed in their use of an innovation" (p. 1057). Based on ideas of Klein and Sorra (1996) and Choi and Chang (2009), robotic process automation implementation implies that multiple stages are involved, starting from initiation or adoption, to adaptation and acceptance, and ending with routinization. Real and Poole (2005) label the view of implementation as adaptive because during implementation, initial ideas might change in a rather fluid process. This is in line with the study of Repenning (2002), in which he describes that implementation is an evolving effort in which employees can change behavior depending on feedback and/or initiatives from managers (Higgs & Rowland, 2011). Inspired by the definition of implementation of Trullen et al. (2020), the following definition for RPA implementation is defined as "a dynamic process starting with the decision to introduce robotic process automation (also known as adoption), during which organizational actors (such as line managers, IT, personnel) engage with it, interacting amongst themselves and attempting to shape it to fit their requirements and needs, until the use of robotic process automation become routinized". Since various studies recently highlight the importance of the role of employees, CEOs and top management and other organizational actors besides the often-studied role of line managers (Trullen et al., 2020), this definition includes all organizational stakeholders who engage with using RPA.
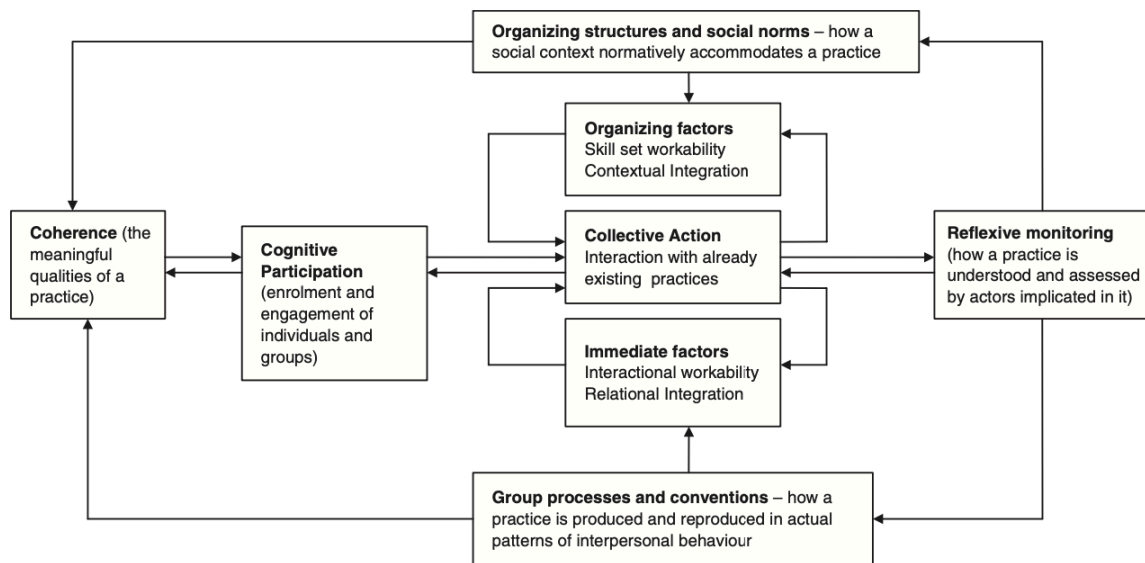
2.2.2 Sensemaking and sensegiving

To explore how the implementation process of RPA unfolds, the sensemaking and sensegiving lens is functional to understanding the implementation process through organizational actors. To begin with, Balogun and Johnson (2004, 2005) describe that for successful implementation and change, a shift in the way employees give meaning to the organization and the environment is required. Accordingly, prior literature has been researching the unfolding of change in organizations as "processes of sensemaking and sensegiving" (Canato, Ravasi, & Philips, 2013, p. 1744). One of the first researchers to connect sensemaking and change were Gioia and Chittipeddi (1991). In this study, sensemaking/sensegiving was identified as a process consisting of 4 phases: envisioning (sensemaking), signaling (sensegiving), revisioning (sensemaking), and energizing (sensegiving) (Gioia & Chittipeddi, 1991). In the theory of sensegiving and sensemaking, sensemaking is about "creating an understanding of a change, and sensegiving is about influencing the outcomes, communicating thoughts about change to others, and gaining support" (Kezar, 2013, p. 763). Gioia and Chittipeddi (1991) described sensegiving as "the process of attempting to influence the sensemaking and meaning construction of others toward a preferred redefinition of organizational reality" (p. 442). A

sensemaking lens is to better understand the process of organizational change (Weick, Sutcliffe, & Obstfeld, 2005). This lens emphasizes on meaning construction and structuring reality "during social interaction, a complex, idiosyncratic, interactive, retrospective and continual process through which captured cues are translated into meaningful information (Guiette & Vandenbempt, 2017, p. 66). Sensemaking and sensegiving have been seen as identical with creating narratives and that these narratives are used to influence others (Currie & Brown, 2003; Gabriel, 1995). When looking at studies, Stavrou and Ierodiakonou (2016) illustrates that alignment of expectancies amongst various actors in the use of a HR policy had better effect on the success than the presence of the practice itself. Various actors hold a crucial role in sensegiving, like line managers, employees, practitioners, and top management. A study of Trullen and Valverde (2017) shows that involvement of line managers in development of new practices increases chances of successful implementation since the line managers can make better sense of it through involvement and awareness. Furthermore, leaders have to understand workers' sensemaking desires and incorporate their desires in the sensegiving attempts to provide clarity (Kim, Hornung, & Rousseau, 2011, p. 1674). Besides sensegiving and sensemaking of various actors in the implementation of a new practice, it is also important that organizational support is provided to create a strong implementation climate (Mirfakhar et al., 2018).

2.2.3 Linking Normalization Process Theory to Sensemaking

Given that implementation processes involve interactions among a variety of actors as they attempt to shape the practice that will finally be routinized (Trullen et al., 2020), the Normalization Process Theory of May and Finch (2009) offer a framework for a better understanding of the implementation process. May and Finch (2009) state that the Normalization Process Theory (NPT) is "concerned with the social organization of the work (implementation), of making practices routine elements of everyday life (embedding), and of sustaining embedded practices in their social contexts (integration) (p. 538). Since implementation is defined as a process, the NPT is a theory that helps to make the process of RPA implementation clear. Based on the definition of the model by May and Finch (2009), for RPA implementation the model provides a framework to analyse the dynamic mutual work and relationships in the implementation of RPA. In this model, four determinants of normalizing complex implementations in practice are identified as well as the relationships between these determinants: coherence (or sense making), cognitive participation (or engagement), collective action, and reflexive monitoring (May & Finch, 2009). Consequently, these mechanisms are affected by various elements that encourage or constrain the routinization/normalization of a practice. Figure 3 shows the model of the components of normalization process theory (May & Finch, 2009).

Figure 3. Framework of the Normalization Process Theory (May & Finch, 2009)

In order to get a comprehensive view of the implementation process with the lens of sensemaking and sensegiving in the implementation of RPA, the implementation activities in the NPT model of May and Finch (2009) will be linked to sensemaking and sensegiving theory. The model's starting point is the component 'coherence'. Coherence means that a practice is made possible by a set of ideas about its "meaning, uses, and utility, and by socially defined and organized competencies" (May & Finch, 2009, p. 542). By looking at this starting point through the sensemaking lens, it is aimed to look at how various actors like managers, employees, and top management understand and see the meaningful qualities of RPA. Implementation processes are made up within purposive interaction chains, which is framed through cognitive participation. May & Finch (2009) state that this is the "symbolic and real enrolments and engagements of human actors that position them from the interactional and material work of collective actions" (p. 543). Acceptance and commitment of organizational actors are important with cognitive participation. Based on the theory of May & Finch (2009), this means for RPA implementation that initiation involves work that brings the use of RPA forth, while enrolment encompasses people working together and arranging themselves to using RPA, thereby organizing a community of practice.

Moreover, May & Finch (2009) describe collective action of actors as "the component of mental and material work that is about organizing and enacting a practice" (p.544). The work here is either to reshape actions and behaviours or to reorganize organizational relationships and context by aiming at a goal with collective purposive action. However, May & Finch (2009) also argue that the orientation on the goal involves investment of effort around the practice, but the implementation may include resistance, subversion, reinvention, affirmation, or compliance. May & Finch (2009) also mention two important qualities in the work of enacting a practice: the interactional workability (the way actors operationalize it), and the relational integration (the way a practice is understood by individuals). Furthermore, two qualities are important in organizing conditions: skill-set workability (the required skillsets

to allocate a practice), and contextual integration (inclusion within a social context) (May & Finch, 2009). When linking this point to the sensemaking and sensegiving lens, it is important to understand how various actors around RPA organize and understand the practice and understand what kind of skills are needed by actors to enact the usage of RPA.

The last component of the NPT model is reflexive monitoring. May & Finch (2009) state that "patterns of collective actions and their outcomes are continuously evaluated, both formally and informally, by participants in implementation processes, and the formality and intensity of this monitoring work reflects the nature of their cognitive participation and collective action" (p. 545). For RPA implementation, this means how participants make sense of the evaluation of RPA implementation in the implementation process.

With sensemaking being fundamentally reflective and built on the conceptions that sense is made after an activity, and implementation activities built on the notion that actors first of all require an understanding of the change and subsequently develop mutual understanding through sensemaking at an organizational level (Stensaker, Falkenberg, and Gronhaug, 2008), it is important to understand the way actors make sense of the coherence, cognitive participation, collective action and reflexive monitoring in the implementation of RPA, by looking for example at how actors give meaningful qualities to a practice, how they enroll and engage with each other with the use of RPA, what skills are needed for the implementation of RPA and how it interacts with existing practices, and how RPA is understood and assessed by actors implicated by it.

2.2.4 Implementation effectiveness

Woodrow and Guest (2014) found that even in implementation practices that are well designed, a fail in implementation processes might result in counterproductive results. During implementation, middle managers have been found to have great influence (Floyd & Wooldridge, 1997). Floyd & Wooldridge (1997) mention that these middle managers can influence both upward and downward by providing information and supporting change initiatives and by providing flexibility in implementing new practices, as they state that "managers translate goals into individual objectives, monitor activities to support top management and thereby also sell top management initiatives to subordinates" (Floyd & Wooldridge, 1997, p. 165). Based on this, Stensaker et al. (2008) argue that with implementation and change activities, different organizational levels and groups mediate and negotiate in an attempt to interpret and translate corporate intentions. In order to understand how implementation unfolds, various studies assume that communicative actions such as narratives, discourses, and metaphors are key (Trullen et al., 2020). This idea will have a key role in understanding how the implementation of RPA unfolds in an organization through looking at how actors make sense and narrate their understanding of RPA.

For the effectiveness of RPA implementation, this means that it is important to understand how the organization perceives the benefits of RPA. All of the actors within the organization can have different characteristics, beliefs and values, that affects the achievement of effective implementation (Mirfakhar et al., 2018).

3. Research methodology

3.1 Study design

Since the objective of this study was to understand how various organizational actors understand, make and give sense to RPA during the implementation process, this research is designed according to a qualitative research approach where semi-structured interviews are conducted. Since this research aims at an in-depth understanding of the human behaviour and insights on 'how' and 'why' actors behave and think in certain ways when implementing RPA, a qualitative approach is most suited (Yin, 2013). The Normalization Process Theory (May & Finch, 2009) has not been linked to the implementation of RPA beforehand. Overall, the four primary dimensions in the Normalization Process Theory – Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring – are thoroughly used in the interviews to identify the story of implementing RPA, the way it is understood, how people make sense and provide sense of it.

In line with the goal of this study, this study has chosen a single case study method as it is appropriate to gain a thorough and detailed understanding of various human actors within the organization (Yin, 2013), and because it involves the use of one case organization to expand the theory on RPA implementation based on empirical evidence (Eisenhardt, 1989). A case study is an empirical study that permits for retaining a complete view, by investigating an ongoing phenomenon in depth and within its real-life context, especially in the instance when boundaries between phenomenon and context are not evident (Yin, 2013).

A large financial service provider in the Netherlands, from now on called Company X, was selected as a case study. This organization was selected because it was well positioned to study RPA and the role of various actors, given that it started the introduction of RPA in 2017 and executed RPA with over 300 RPA-robots in 2020, enabling the possibility to research the implementation process involving actors from various organizational levels.

Qualitative research, broadly defined, means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Corbin and Strauss, 1990, p. 17). Qualitative research is interpretive and relies on rich empirical data (Vaivio, 2008). Moreover, qualitative research approaches are used to understand human beings and the nature of transaction between human beings and the environment (Ormston, Spencer, Barnard, & Snape, 2013). It is an approach to get a real picture based on the experiences of humans themselves. Typically, qualitative approaches involve a small sample size, unique, and focused, and attempts to explain the questions of why an event occurs, through more flexible data collection (such as speech, observations, documentations, and reaction of the respondents.

3.2 Data collection

Qualitative data was gathered through the use of semi-structured interviews with respondents from various teams and departments within the organization that used RPA systems and additionally through a questionnaire among work teams. In order to maintain the qualitative approach of the study, the questionnaire only consisted of 7 open-ended questions

that are formulated in an exploratory way. The questionnaire was used due to the time constraints of the research and the inability to conduct interviews with each user. The reason to use a questionnaire with open-ended questions for employees was because reaching the employees through a questionnaire was more feasible due to the global Covid-19 pandemic. Also, the employees were chosen to send the questionnaires because it was important to be as less obtrusive as possible to get unbiased responses regarding their thoughts and understanding of RPA. The goal of the questionnaire was to get input from a representative sample of employees and their managers on their understanding of RPA within various departments of the organization. A condition was that the department had to be involved in the use of RPA.

In qualitative research, the ideal number of interviews is not consistently presented by literature (Marshall, Cardon, Poddar & Fontenot, 2013). However, several researchers agreed that "interviews should continue until theoretical saturation is reached" (Nissen, 2005, p. 235). For this study, 22 in-debt interviews were held with organizational actors, varying from employees within various departments, such as the management, operational teams, and robotics. An overview of the units of analysis is shown in table 3. Additionally, another 20 respondents (16 employees and 4 managers from two teams) filled in the questionnaire with open-ended questions. Respondents of the questionnaire were employees and their managers whose work and way of working was affected by RPA. Anonymity was guaranteed both in the email that included the link to the questionnaire as well as the beginning page of the questionnaire. A condition was that the department had to be involved in the use of RPA. Respondents who did not fill in their function or submitted the questionnaire without answering questions were deleted. To get an understanding from the employees' perspective, questions such as "How do you experience the use of RPA?" and "How has your work changed through the use of RPA?" were asked. These questions turned out to be very valuable as they often provided employees who worked at the organization for a long time and therefore had experienced the use of RPA since the first day. The entire questionnaire can be viewed in the Appendix.
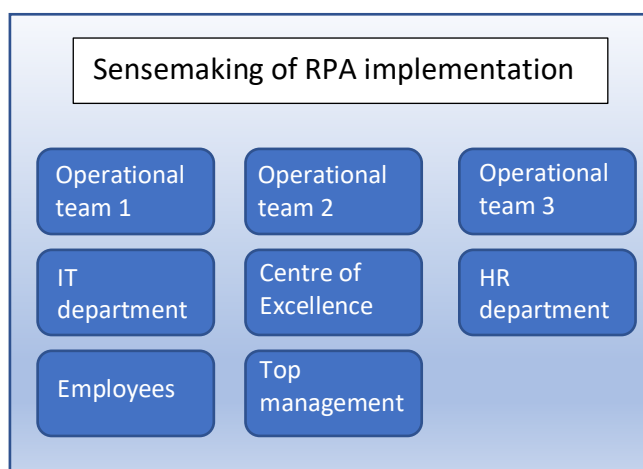

Table 3. Case study design

3.3 Interviewee structure and selection

The interviews were initially supposed to happen face to face. Due to the Covid-19 pandemic, these interviews could not be held in person. As a creative alternative, the interviews were held online. Although some of the dynamic is lost when conducting an interview online (for example really seeing their body language and intonation), by using video conferencing, a positive dynamic was created. However, conducting interviews online also had advantages. Since travelling was not needed, the planning of the meeting was much easier.

Each interview lasted approximately 60 minutes, which is the limit of the optimal interview length for semi-structured interviews according to Adams (2015). The interviews were conducted in Dutch and started with a short introduction for the respondents regarding the overall topic of the research. Subsequently, key questions related to the four dimensions of the Normalization Process Theory in relation to the implementation of RPA as well as the interview-specific, probing questions on the answers were asked to each individual respondent.

Purposive sampling, which is often used in qualitative research, was chosen to identify and select the information-rich cases (Patton, 2002). In this case study, the selection of respondents for the interviews was based on a few conditions. Most importantly and in relation to the research (question), the interviewees needed to be related to the usage of RPA within the organisation. For selection this meant identification and selection of individuals and teams who were proficient and informed with implementation of RPA in Company X. Respondents should either be involved in decision-making, building, and/or using RPA. The reason that purposive sampling was chosen for this research instead of random sampling, as to concentrate on people with particular characteristics who were better able to assist with the research. For the most part of sampling, a snowball sampling method was used to find interviewees. An overview of the respondents is shown in table 4.

Tag	Interviewee department	Duration of interview
COE_1	RPA Centre of Excellence	115 minutes
COE_2	RPA Centre of Excellence	79 minutes
COE_3	RPA Centre of Excellence	59 minutes
COE_4	RPA Centre of Excellence	51 minutes
Team1_1	Operational team 1	57 minutes
Team1_2	Operational team 1	60 minutes
Team1_3	Operational team 1	58 minutes
Team1_4	Operational team 1	58 minutes
Team2_1	Operational team 2	60 minutes
Team2_2	Operational team 2	59 minutes
Team3_3	Operational team 2	53 minutes
Team3_1	Operational team 3	55 minutes
Team3_2	Operational team 3	58 minutes
Team3_3	Operational team 3	58 minutes
TM_1	Top Management	60 minutes
TM_2	Top Management	60 minutes

TM_3	Top Management	30 minutes
HR_1	HRM	60 minutes
HR_2	HRM	59 minutes
HR_3	HRM	59 minutes
IT_1	IT department	60 minutes
IT_2	IT department	55 minutes

Table 4. Overview of respondents

3.4 Analysis and coding

The interviews were audio recorded with permission of the respondents and subsequently transcribed using the software 'Amberscript' and manually corrected where necessary. Afterwards, the transcripts were sent back to the respondents for verification. Also, all interviewees were assured of confidentiality and anonymity. After the transcription and verification on the interviews, all data was inserted in the software 'ATLAS.ti'. For the coding of the data, the chosen method of analysis for this research was an approach of qualitative methods including both inductive coding from themes emerging in the respondents' discourse and deductive coding deriving from the predefined set of codes which are inspired by the normalization process theory (May & Finch, 2009).

First, open coding is used in the raw data. All the transcriptions were read and subsequently re-read to label codes according to the open coding strategy (Strauss & Corbin, 1990). The first step was creating first-order codes that were derived from the raw data. These first-order codes are literal themes that come from individual interviewees. As an example, the first-order code 'using lean' is created to illustrate that a lean philosophy is used to make sense of RPA and increase the chance of successful usage of RPA. Afterwards, categories are made within the data with first-order codes by re-reading the transcriptions to identify interconnections between the first-order codes. These categories are set as the second-order codes by using axial coding. As an example, the first-order codes 'creating parties', 'celebrating the launch of RPA', and 'promoting the go-live of RPA' partly described how a positive climate towards RPA usage was created within the organization. These interconnections defined second-order codes.

After defining the second-order codes, the third-order codes were defined. However, these third-order codes are categorized both inductively and deductively. The third-order codes are derived both from the theoretical framework (NPT framework) as well as the created second-order codes. The third-order codes are identified inductively using axial coding to find interconnections between the codes. The third-order codes that were identified were presented in four input groups that were found in the theoretical framework, meaning these input groups were used as aggregate dimensions in which the third-order codes fit. The reason for this approach, was that the framework of the Normalization Process Theory (May & Finch, 2009) was used as a guideline and framework to analyse how organizational actors make sense of the implementation work when implementing RPA within the organization. The framework consists of four main categories, namely Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring.

Figure 4. Coding process

Inductive ⟶   Deductive ⟵

Raw data → First-order codes → Second-order codes → Third-order codes → Theoretical framework
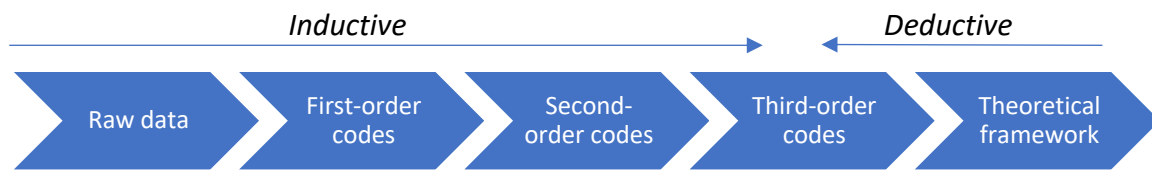
Overall, both open coding was used to identify first-order-, second-order-, and third-order concepts to create theory from the raw data regarding the way organizational actors make sense of the implementation process within the organization (Strauss & Corbin, 1990). Based on the established framework of the Normalization Process Theory (May & Finch, 2009), the categories within this framework are used as aggregated dimensions in which the identified categories are applied based on where the researcher seemed fit. Using categories based on an established framework is also called template coding (Crabtree & Miller, 1999). This has been done because the main objective of this research was to understand how organizational actors make sense of the implementation process of RPA, and the Normalization Process Theory allowed the researcher to frame the implementation process, understand the work that actors do during the implementation process and the way they make sense of the implementation process of RPA. The distinguishment between the terms sensemaking and sensegiving is based on the theory of sensemaking and sensegiving (Kezar, 2013). Namely, sensemaking is understood as the way organizational actors creates an understanding of a given concept, for example the way an organizational actor perceives RPA benefits, or the way a top manager or employee thinks or feels about RPA. Sensegiving on the other hand, is about the way various organizational actors communicates their thoughts and ideas to others, makes efforts to gain support, or tries to influence the way other people think about RPA. Examples are the way RPA is promoted within the organization, the efforts of organizational actors like top managers or employees of persuading others to support RPA.

4. Findings

In this section the findings of the interviews in relation to organizational actors' sensemaking to the implementation process of RPA, which is placed in the Normalization Process Theory framework (May & Finch, 2009), are presented. The results are based on the data and certain quotations serve as evidence. The quotations can be traced back to the source but are anonymized. Individuals within the groups that are interviewed are given a number and the groups are divided into the following: team1, team2, team3, COE, IT, HR department, top management (TM), employees. The order of the results starts with a brief background regarding the case organization and RPA context within this organization, followed by the aggregate dimensions coherence, cognitive participation, collective action, and reflexive monitoring.

4.1 Case organization and RPA context

4.1.1 Case organization – Company X

The case study within this research is performed at a large financial services firm located in the Netherlands (in this research called 'Company X'). Company X carries out its work with over 40.000 employees. Currently, Company X is in a transformation process which the interviewed employees name as 'decentral to local movement'. Prior to this transformation, the organization had many divisions throughout the country that were operating independently in a decentral way. The transformation led to the centralization of the organization by (partly) closing or restructuring the independent divisions throughout the country. The administrative tasks and decision-making are being moved to the central headquarters of Company X. As many administrative tasks are being centralized with this transformation, interviewees point out that this makes room for many processes and tasks to be re-designed to create efficiency, creating possibilities for automation and the implementation of RPA. As a result, this creates a lot of new work for current employees to work on.

4.1.2 RPA at Company X

Company X was first introduced to RPA in 2017 by two employees. The initiation of RPA is done through a bottom-up approach, meaning that two employees proposed RPA to the top management. These two employees already started making sensemaking efforts, as they saw RPA as an innovative technology to increase efficiency and adapt to the developments regarding the decentral to local movement. They believed that a lot of manual, repetitive work was still carried out by employees and mentioned that Company X was unable to increase efficiency in the manual, repetitive tasks through regular IT automation, as the deployment of regular IT automation took a lot of time to develop. COE_1 explains:

"Our change calendar was so full of all kinds of major changes in regular automation in the field of legislations and regulations that everything related to efficiency dangled somewhere at the bottom and eventually fell off the calendar. So, we never actually implemented improvements".

The early sensegiving efforts started by presenting the idea of RPA to the top management. The top management supported the idea and defined RPA as an important goal for the organization in 2017. Additionally, Company X created a Centre of Excellence (COE) for RPA as the central department for RPA implementation and facilitation. The COE is responsible for training and guiding employees to use RPA, as well as facilitating, testing and validating RPA robots**.** Company X moved to sensemaking efforts by communicating that RPA should have a business-driven implementation approach instead of the regular IT implementation approach. This means that they believed that operational departments within Company X should be responsible for the implementation of their RPA robots, with the Centre of Excellence as a centralized department for facilitation, support, training, and testing of RPA robots. Figure 4 illustrates a timetable of important milestones of RPA in Company X.

Figure 4. Timetable RPA milestones

4.2 Coherence

In this chapter it will be defined how the interviewed organizational actors make sense individually or collectively of the work of implementing RPA and what they perceive as important. This chapter therefore belongs to the dimension of coherence. Overall, coherence plays a central role in the way organizational members make sense of RPA implementation. The coding overview of the aggregated dimension 'Coherence' is shown in table 5.

Dimension	Third-order codes	Brief explanation	Example quote
Coherence	Difference between RPA and traditional IT	The way RPA as a solution is understood in comparison with traditional IT solutions.	*"In general, most IT architects don't think robotic process automation is a long-term strategic solution, so they see it as a quick fix type of way to do integration." (COE_4)*
	Framing differentiating factors	The way organizational actors give sense to the differentiating factors of RPA as a solution.	*It is also possible that you use robotization, because it can be delivered very quickly, sometimes as a temporary solution until the automation part is ready." (IT_2)*

Coherence	Value, benefits, importance	The way sense is made and given regarding value, benefits, and importance of RPA.	*"If you do a repetitive task very often, people will eventually make mistakes; robots don't."(TM_1).*
	Personification of RPA	The way RPA is framed and humanized through personification within the organization and the way others make sense of this framing.	*"Then it is seen as a real new birth as is pretty much a new employee."(COE_3);* *"We call the robot from baby to toddler, from toddler to teen and so on. That's how we build this robot to maturity, so yes that's quite a metaphor to make a comparison." (Team1_1)"*
	Celebration of go-lives	How sensegiving efforts are made to increase awareness within the organization through celebrations.	*"When a robot goes live, we make a thing of it. there were rusks with mice, balloons, everything was pleasant." (Team3_2)*
	Engagement of employees	Giving sense to employees by using terms to increase understanding and create engagement for RPA initiation.	*We have to have a close collaboration with the employees who suggests things that the robot is supposed to do. And if that is the case, we will also focus more on the unhappy flow, what if that robot crashes" (Team2_2)*
	Encouraging employee involvement	Related to the way employee involvement is encouraged	*"We have now offered for example, a session called 'women about robotics'. It was completely full, and 60 ladies were super enthusiastic. So, if you offer it now, people will find it really interesting and fun." (HR_2)*

Table 5. Coding overview coherence

Differences between RPA and traditional IT – Respondents indicated that Company X experienced challenges and constraints by using traditional IT technologies to solve their business cases, particularly related to increasing efficiency. These challenges and constraints are found to be mainly related to overloaded IT departments and lack of technological solutions for smaller, ad hoc projects. The two employees that first initiated RPA first had to develop a shared understanding of how RPA differentiates from traditional ID, particularly because simple, repetitive tasks which are done by employees could simply not be automated with existing technologies due to limited time and resources, as shown in the following quote:

"We actually didn't have any technology at our disposal, because the only thing there is, is the traditional automation with which you actually make processes more efficient. But we had the challenge that we received a lot of ad hoc wishes and requests where, say, traditional IT solutions are just not the business case for." (TM_1)

In framing the differentiating factors, the respondents mainly give sense by highlighting the speed of implementation, flexibility, scalability and the configuration and initiation from the business side instead of the IT department as main differentiating factors between RPA and traditional IT. However, some respondents make sense of RPA as a temporary solution to a problem when regular automation is not (yet) possible. Other respondents also acknowledge that even though they see traditional IT solutions as a long-term solution, RPA is faster and easier to implement than traditional IT solutions. However, sensemaking efforts are often related to framing RPA as a solution to increasing efficiency, whether it is a short-term solution or a long-term solution.

"Robotization is a solution when, for example, an API is no longer available between applications, which means a lot of repetitive work is done manually. You want to get rid of that human repetitive work. And in many cases, automation can play a justified role in it. It is also possible that you use robotization, because it can be delivered very quickly, sometimes as a temporary solution until the automation part is ready." (IT_2)

Value, benefits and importance - Since 2017, Company X has built over 300 RPA robots to automate repetitive, manual tasks. Much effort went into sensemaking efforts in framing the added value in terms of costs. As a result, Company X measures the value of the work that RPA does as hours that would normally be spent by employees on the specific tasks. In 2020, Company X reached over 1 million hours which is measured by the hours of work which would normally be done by employees. As a result, respondents mention that as the implementation of RPA advances and Company X is being used to RPA, they believe it has reached a point where it is not feasible to work without RPA. To illustrate, RPA has automated so many repetitive tasks, that working without RPA would simply not be possible for employees and also cannot be accounted by managers. The following quote illustrates the way importance of RPA is now seen by respondents:

"The past period, the robot did 50,000 hours of work in a few weeks, but if you had to hire employees for 50,000 hours in a few weeks, that would mean hiring 200 FTE, letting them do the work and leave again. Of course, that is not even possible."(TM _1)

Respondents mainly perceive the following benefits of RPA: *increase of speed doing tasks, work gets easier, repetitive and boring work disappears.* In the initiation phase of the implementation, sensemaking moves to a point that most of the interviewed respondents frame as "*eliminating work that make people unhappy*", meaning that it is framed as a positive

outcome for employees. Also, employees spend a lot of time doing repetitive tasks, which may also lead to human failures. Another perceived benefit is that RPA reduces mistakes in carrying out tasks, as illustrated by the following quote:

"If you do a repetitive task very often, people will eventually make mistakes; robots don't." (Top manager 1).

The top management give sense regarding RPA benefits by communicating about improving quality and efficiency through RPA. By using RPA, employees can finish their tasks faster. Tasks that take a long time to do, for example gathering different kinds of documents, can now be assisted by an RPA, making the work of employees easier and increases quality and efficiency at the same time.

"The work that you previously had to put aside for a week or actually a whole month to do, those big tasks, can now be done very quickly because of RPA." (Team2_2)

As more and more RPA robots are built, the management perceives the benefits of RPA mostly in the ability to realize more work with the same number of employees. Other benefits that are mostly perceived by management is the ability to build a robot in a very short amount of time (with some robots taking up around 10 to 14 days to build) and its flexibility to work 24 hours a day when needed. An often mentioned way of sensemaking by management regarding the flexibility of RPA, is by stating that the robots 'retire' when its work or project is completed. This creates the sense that the RPA robots can quickly be built, but also quickly shut down through a 'retirement'.

Moreover, as can be seen from the interviews, sensemaking is done by employees in perceiving the benefits of using RPA in a way that it strengthens the capabilities. This is especially the case for high-educated employees who fill a job position in which they have to analyse data frequently. Prior to doing any analysis, the data collection is the first step. This step is regarded as very time consuming and the spent time does not have an added value to the actual analysis and outcome. By using RPA, employees do not need to spend hours on collecting all kinds of data to eventually do their actual work of analysing. The following quote of an employee illustrates this perception of the advantages of RPA:

"I no longer have to spend my time on work that is actually very easy but that is necessary. And I can spend the time on the things where I really add value to that analysis." (Emp_2).

Finally, additional benefits that are perceived by employees in the way they make sense of it are increasing work satisfaction due to elimination of the so-called boring tasks and the possibility to spend time on increasing knowledge with more challenging activities. Lastly,

a remarkable benefit pointed out by an employee is perceived in health and safety benefits, as shown in the quote:

"I believe it is also technically better in terms of health and safety. I experience fewer physical complaints in my hands, arms, and neck." (Emp_4)

Personification of RPA – Besides sensemaking and sensegiving efforts towards the understanding of RPA and the perceived value, benefits, and importance, one specific concept is identified in the coherence work of organizational actors in implementing RPA. As RPA implementation moved to a further stage in Company X, a second wave of sensegiving was presented among the organization. The primary strategy used by several departments including COE, team 1, team 2, HR, and top management to create a positive sentiment among RPA implementation was *personification of RPA.* This is regarded as an important factor regarding the way the organizational actors make and give sense of RPA that emerged from the interviews relates to the personification of RPA. Personification refers to organizational actor's perceptions of characterizing RPA with human characteristics. As mentioned by most participants, they gave sense to the RPA robots by perceiving it as a human or virtual colleague. As an example, the robots were given human names, such as James, Max, Bob. One manager respondent explained that they made sense of the robot as a child that goes through certain growing phases, while other respondents often stated that RPA robots also 'retire' when the work is done. The following quote illustrates how they make sense of the personification of RPA:

"We call the robot from baby to toddler, from toddler to teen and so on. That's how we build this robot to maturity, so yes that's quite a metaphor to make a comparison." (Team1_1)"

However, differences were found in how teams and employees give meaning to RPA in terms of naming. A remarkable finding is that teams that have been identified giving meaning to RPA as "virtual employees" with names and that talk more in human terms and metaphors seem to have a better understanding of RPA's purpose, higher commitment and better involvement in collaborating with the robot. This is evident from the way in which RPA is discussed within the department and how employees make meaning of the use of RPA. Within these teams, none of the respondents mentioned a fear of losing their job. These respondents rather mentioned the challenge of being able to carry out more specialist, non-standard work activities. On the contrary, respondents from teams that have been identified that are not making sense of RPA as "virtual employee" with names, are more often mentioning a fear of losing their job due to RPA. Another possible explanation as to why these respondents don't fear job losses due to RPA, is that respondents mentioned that the organization attracts additional work for employees. This gives the sense that with the same amount of people, more projects and work can be done due to RPA, as illustrated by the following quote:

"So, we have a local to central movement that we have been using for a few years now and all the hours that are released due to RPA, we fill these hours up centrally with new activities that we transfer from a local to a central location. And because of that, you actually see that we save a lot of hours, but in the end, the people on the side of the central departments, they do not lose their jobs because we only attract additional work." (Team2_3)

However, the local to central movement within the organization, which is explained in the previous chapter, is considered finite by some respondents, meaning that a point of saturation will be reached in the work activities that are related with centralizing the organization. Related to this sensemaking of seeing the centralization as a finite process, participants highlighted the vital role the management plays in creating awareness for the future. One participant explained the way the management's openness and transparency creates opportunities and awareness for employees to retrain and develop.

"I think Company X is a very socially responsible organization. They actually continuously discuss with people like 'be cautious, because it might take a few years, but the work that we are doing is finite', so they are very open and transparent about that. People that have an MBO degree are allowed to do higher professional education at the organization's expense, so you know the organization invests a lot of time, energy and also resources in re-training those people in other areas." (Team2_2)

In contrary to the positive sentiment regarding the personification of RPA, respondents also mentioned the negative effects of personification of RPA on top management buy-in and involvement. Sensegiving efforts towards personification of RPA gave top management the belief that RPA was oversimplified and could be done with very little resources. The reason for this was the perception of managers that RPA was easy to configure, and by giving the robots a name, respondents recognized it created a perception of over-simplicity as explained in the following quote:

"In the beginning, personification was done towards the top management, but then at a certain point, managers had the thought that you can put such a robot together in an afternoon. But it isn't like that, because it's just a lot more than that, and that really has a lot more to do with programming than people think." (Team2_2)

Celebration of go-lives - Various respondents explained that the teams celebrated the moments that a robot went live for the first time. The celebrations are used as a sensegiving strategy to create awareness and involvement from various organizational layers, wherein employees, managers, and various other teams were invited to participate. These celebrations were found to improve the awareness and involvement regarding RPA throughout the organization.

"It is extra for the employees; they feel more involved. We also always try to celebrate a bit: when a robot goes live, we make a thing of it. there were rusks with mice, balloons, everything was pleasant." (Team3_2)

However, one respondent mentioned the importance of testing the RPA robot prior to it going live. As these celebrations are used to increase positivity, it has also been a tool for other organizational actors in the early stages of implementation to make sense of RPA and see its purpose, benefits and importance, thereby improving the breadth of engagement across various departments. However, respondents mention that in the early stages, these celebrations failed by malfunctioning RPA robots, thereby creating a barrier to successfully promote RPA through the organization. Not surprisingly, the participants mentioned a lack of testing as one of the main causes for a negative representation of RPA among other teams, employees and managers. The negative perception can directly be linked to a failed presentation of the teams, as explained in the following example of a respondent:

"The team had promoted the go-live of the robot all the way, including to the teams around it. They told everyone they were getting their own robot, and everything is through. Well, at noon everyone comes to us to celebrate the new robot, but then it didn't work. That was of course very difficult, because lots of team leaders, among others, came. When they became curious and asked us to demonstrate how it works, we couldn't." (Team3_2)

Overall, this shows that celebrating the go-live of an RPA project shows that Company X is focused on spreading positive involvement through the organization by launching new RPA projects. The interviewed respondents also indicate that by creating an atmosphere where celebrations are held, more employees from within the department also become enthusiastic and thereby more involved in the process. Even though this approach has worked quite well for involvement, a faulty celebration may cause negative perceptions among organizational actors that are not yet aware of RPA potential. It is therefore very important to check and test for technical issues before celebrating a go live.

Need for individual engagement of employees – When looking at the way RPA should be implemented, respondents early on recognized that the way to propel and make understanding about RPA possibilities is to involve employees who are working in the operational teams. The way robotic engineers seek active engagement with employees is by collaborating with employees that do the work tasks manually at the time. Participants from the robotics teams agree that collaboration with employees is essential to successfully find RPA solutions and thereby also fulfil the wishes from the employees. Employees provide robotics teams with information about what they would want the RPA robot to do. A way of making sense towards RPA solutions is by calling the processes *'happy-flow'* and *'unhappy-flow'.* The 'happy flow' of the RPA creates a sense of positivity towards employees as

collaborating is necessary. However, respondents explain that employees should feel involved in building the robot. Besides the happy flow of RPA, the respondents from the robotics team also explained the 'unhappy flow' of RPA. The unhappy flow is related with potential technical issues that could arise, such as a robot that crashes or doesn't get the right input from the system. The happy and unhappy flow are the way the robotics teams gave sense to the outcomes of potential RPA projects, in a way that is easily understood by employees in the department as well as the organizational actors within the robotics teams.

"Happy flow is actually that the employees say 'it has to click here, do this and do that'. Then we build it for them, but we also show them by giving demos and having a lot of contact with them to find out if it works the way they would like it to work and if the robot does what it's supposed to do." (Team3_3)

Encouraging employee involvement – Respondents talked about how sensegiving conversations towards employees were not always sufficient to involve employees in the implementation of RPA. The respondents explained that keeping employee's sentiment positive towards RPA is one of the main challenges when involving employees. So, teams created workshops and demos to demonstrate RPA by showing immediate results to employees. These tools have been highlighted as essential in creating awareness and involvement.

"We try to visit a location once a month. We hold demos at that location of what we are doing at that moment. So, which robots are under development, what have we delivered so far? So, then we actually take everyone with us completely, and those demos are also quite well attended by employees I must say. That keeps them very involved with what's going on." (Team2_2)

The HR department is also found to be having a positive effect regarding the creation of engagement of employees regarding RPA. Events that have been organized by the HR department for employees have seen high attendance from employees that previously were not aware of RPA. Offering training and learning options for employees to make sense of the changes that are occurring with the implementation of RPA are therefore indicating positive effects as shown in the following quote:

"We have now offered for example, a session called 'women about robotics'. It was completely full, and 60 ladies were super enthusiastic. So, if you offer it now, people will find it really interesting and fun." (HR_2)

Summarizing the findings about coherence
The interviews represent many concepts in the sensemaking and sensegiving efforts of Company X in the way RPA is implemented. While some respondents consider RPA to be a

temporary solution, it is important to have clear understanding of the way RPA differs from other IT solutions. Furthermore, the concept of personification of RPA is emphasized to be a relevant element regarding involvement and creating awareness. It seems that the respondents in teams where personification of RPA is highly used are more involved with RPA than teams that do not use these metaphors. Also, the celebration of launching an RPA robot for the first time is positively reflected in organization-wide involvement. Offering demos and workshops positively influences sensemaking processes towards RPA implementation.

4.2 Cognitive Participation

In this chapter it will be outlined what organizational actors identify as important factors concerning the dimension 'cognitive participation' that are relevant for RPA implementation. Cognitive participation refers to the way organizational actors engage with RPA, how they build and sustain the practice around RPA. Overall, 8 codes are identified in the interviews that belong to the dimension of cognitive participation. The coding overview is presented in table 6 below.

Dimension	Third-order codes	Brief explanation	Example quote
Cognitive Participation	Intrinsic belief	The importance to have an instrinsic belief that RPA is needed.	*"You have to believe in progress but also persevere when you have a setback, or else it won't work."* (COE_1)
	Confidence and trust	The way sense is given in order to build confidence and trust in RPA.	*"At one point an RPA version was delivered, and you noticed that manager's attention was lost. So that has been a limiting factor."* (Team3_3)
	Purpose of implementation	How the purpose of implementation is understood by sensegiving and sensemaking efforts.	*"If you start communicating in the direction of the goal of saving as many FTEs as possible, people can develop tensions at some point."* (Team1_2)
	Experimental sensemaking and sensegiving	How employees and (top) managers are persuaded by using small experiments and pilot projects.	*"People suddenly became very interested in RPA instead of fearing. When they were working with the robot, they suddenly saw and realized: it can't do this yet, and this could be possible. So, this approach also makes it more accessible and understandable to everyone. "* (HR_3)
	Top-management buy-in	How top-management buy in is realised through bottom-up sensegiving.	*"If the top manager is negative about RPA, then you cannot do anything within the organization."* (Team3_2)
	Need for new roles	How employees understand the way RPA creates a need for new roles.	*"We realized that we had to form teams specifically for robotics".* (COE_2)

Table 6. Coding overview cognitive participation

Intrinsic belief – It is particularly important for RPA implementation that both employees as well as management are intrinsically convinced of the use of RPA, so that Company X can successfully engage with and implement RPA. Practices such as providing demos and workshops as explained in the previous chapter are essential for creating a positive implementation climate among employees, managers, and other departments that are not yet aware of the potential of RPA. Respondents highlighted the importance of allocating time and priority from management perspective to implement RPA. However, based on the analysis, one main challenge is found: the over expectations of RPA in the top management. Even though convincing top managers about the usage of RPA is not perceived as the biggest challenge, managing their expectations and setting realistic expectations are perceived as a challenge. A reason for the over expectation of RPA is that RPA is a relatively new, unknown technology. As RPA's main objective is performing human-tasks automatically, managers tend to think RPA could deliver a more cognitive, intelligent solution to problems, which is not the case. This causes managers to have over expectations of RPA, possibly causing disappointments over longer term. It is important for management to give priority and actively take steps in order to find the right first-case RPA solutions to build confidence. As explained by a top manager, the focus should be on slowing down expectations of managers that are convinced of RPA.

"You also see that there are a number of people on the management board that are really convinced, rather sometimes that you say that you have to slow down in expectations with what you can do with robotics instead of having to convince them that something with robotics is possible" (TM_2)

Building confidence and trust – Besides creating an atmosphere where users intrinsically belief in RPA, respondents also highlight the importance of maintaining confidence and trust among managers and employees throughout the implementation. Respondents explain that due to limited resources and time, and a lot of new emerging technological developments such as artificial intelligence and blockchain, interest in RPA quickly faded away in the beginning. *"At one point an RPA version was delivered, and you noticed that manager's attention was lost. So that has been a limiting factor. Saying 'we now have something, and we are doing it for the time being' causes very little attention from the management and that limits to free up capacity for further development of robots." (Team3_3).*

Most employees describe they had low expectations for RPA, with some employees mentioning fear of job losses and others explaining their expectations regarding the elimination of monotonous work by RPA. However, as explained by the employees, when RPA fail to perform due to errors, employees get frustrated and lose their trust in RPA. Once the interest and trust of management is lost, it is hard to get it back. Teams describe repeated sensemaking processes to regain trust from management that had lost interest. As the

intrinsic belief of these teams were very high, they continued to work on small robots to show its benefits to the management, which caused the management to re-gain trust.

"If the robots run well, they take a lot of boring work off your hands. If there is a malfunction with a robot, this has a major impact. Robotization allows us to do our work with fewer people. However, if a robot is malfunctioning, the work piles up quickly because manual processing is slower. Depending on the duration of a malfunction, we have to work several extra days to process the resulting outage / backlog." (Employee_4)

Top management buy-in – Even though RPA implementation has been initiated bottom-up, support by top management is highlighted as a vital role for a successful implementation of RPA. Respondents pointed out that top management support is considered necessary in order to scale up RPA projects. Respondents also highlighted the importance of bottom-up creation of awareness for management buy-in. This has mostly been done by a very small team that demonstrates a small RPA project to top management in order to gain support. When managers do not believe in the value and are not enthusiastic about RPA, it has a negative effect on the implementation, as the top managers are the organizational actors that place RPA within the organizational objectives and agenda. Within Company X, the first sensegiving efforts was done by a bottom-up approach by two employees. This has been done by informing top management about the possibilities and by demonstrations of small RPA projects. So, employees are in a position to give sense of RPA towards top managers, which is regarded as essential for the rollout of RPA. The following quote illustrates the importance of top management buy-in:

"If the top manager is negative about RPA, then you cannot do anything within the organization. I also believe that if you are negative about automation and robotization, I do not think you will grow in the future." (Team3_2)

Furthermore, managers who are supportive of RPA also seem to play an important role in creating further management support among others. Communicating during meetings and internally convincing other managers to see and understand possibilities with RPA during meetings shows positive effects for further RPA adoption, as mentioned by the following top manager:

"It is a frequent topic of conversation on the MT. If I don't think it's important, then I'm afraid that it won't happen soon. So, I think it's important for the executive to embrace it and not just embrace it because we want RPA but embrace it because we want to achieve business goals." (TM_3)

Purpose of implementation – After top management successfully buys into the idea of RPA, sensemaking and sensegiving efforts are given towards the purpose of RPA implementation.

In analysing the way organizational actors make sense of the purpose of implementing RPA, the organizational goals and communication of the goal by various layers within the organization is identified to play an important role. Giving sense of RPA implementation with the purpose to make work more fun for employees and increase efficiency is influencing positive sensemaking efforts of employees. However, various respondents mentioned that when management directly links to purpose of implementing RPA to saving FTE, they became demotivated and their willingness to cooperate effectively decreased. The respondents that became unmotivated due to communications regarding FTE saving, made sense of the purpose of RPA as a means to optimizing processes and thereby making work more fun for employees. This perception is illustrated by the following quotes:

"If you start communicating like this from now on, that it will save a lot of FTEs. Yes, that just has a very negative effect on the department. You shouldn't want that."(Team1_3);

"If you start communicating in the direction of the goal of saving as many FTEs as possible, people can develop tensions at some point. And there was also a lot of communication like that with us. I've always thought that saving FTEs shouldn't be the goal. I found that demotivating, because you optimize your process."(Team1_2).

On the contrary, managers often mention in the interviews that they perceive RPA as an effective tool with which they can reach business objectives. As can be seen from the interviews, cutting costs is seen as an important factor for reaching goals from a management perspective. These respondents believe that creating a sense of urgency is required to provide a purpose of implementation. This is illustrated in the following quote:

"You have to encourage people to realize that work should be done with less, also from the cost side. And there you need to create a sense of urgency and as a manager you always get a bit of resistance for that." (TM_2)

Overall, Company X mitigated the issues concerning the purpose of implementation by communicating the purpose of RPA to 'making work more fun' towards employees and 'increasing efficiency' towards management. Different ways of sensegiving efforts are made, mainly by the middle manager and robotics teams, towards top management and towards employees. This approach of different ways of giving sense to different organizational actors has had a positive effect, as non-top management departments make more sense of RPA in terms of its perceived efficiency and costs, and employees rather make more sense of it as a tool to improve work satisfaction and efficiency.

Experimenting and piloting projects – In order to persuade and motivate employees and managers to be involved in RPA implementation, Company X uses small experiments and pilot projects of RPA. Respondents indicated that building pilot projects have a positive effect on

the perception of organizational actors from all layers. This positive effect seems to have a greater significance on the perception of people when a department starts with RPA for the first time. As RPA might be perceived as an unknown technological solution, teams that start with a small project can use this to demonstrate the potential of RPA, making other team members also aware of the potential benefits and also understand and believe it is right to be involved. Company X has also started with RPA implementation with a small pilot project first to persuade the management. Subsequently, starting small is now become a common practice to share with other important stakeholders, such as employees to get involvement and trust, as well as managers. Directly training future robotics teams to work on RPA projects seems to be less successful, as other participants might not believe it is right to be involved and thus cannot make a valid contribution to it. The following quote illustrates the effectiveness of starting small and demonstrating RPA:

"People suddenly became very interested in RPA instead of fearing. When they were working with the robot, they suddenly saw and realized: it can't do this yet, and this could be possible. So, this approach also makes it more accessible and understandable to everyone. " (HR_3)

Need for new roles – From the interviews it is seen that teams that started building RPA robots quicky recognized that there was a need for new robotic roles within Company X to successfully build the robots. One of these new roles is an analyst, who is considered to have a vital role in the successful deployment of RPA. An analyst role includes looking at all the preconditions of a project. The analyst looks at everything that should happen to automate a certain process. Other tasks include involving risk parties who will estimate the risks, looking at challenging risks and the actions to mitigate these. Lastly, making sure the RPA project isn't against organizational policy and analysing whether test environments for the RPA are available are seen as important responsibilities for the analyst. All the tasks that an analyst does prior to building RPA is called the 'pre-ready phase'. As explained by the following respondent, making a pre-ready phase is all about gathering the necessary information to inform and involve the team in which the potential RPA will be built about the possibilities:

"So, if we have all those points for certainty, then the pre-ready phase as we call it has actually been completed. And then it goes to the team to present it as 'this is the idea that we have, and this is the project we want to run'" (Team2_2).

Based on the interviews, it is found that an analyst is also responsible for the design effectiveness of RPA. This means that for a specific project, every building component is steadily analysed and written down by an analyst. Respondents explain that this work involves mapping how a system process should look like, what the data input should be and how the data output should be done by RPA. This is the so-called 'ready phase' of an RPA project. However, close collaboration with a process manager is needed to effectively do the 'ready phase' of a project. Respondents explained that the effectiveness of the design regarding the

system process, data input and data output is a critical issue since the RPA robots are personified by many respondents, and an ineffective design causes users to blame RPA for failures, when in fact, the main issue lies in the design of RPA. This is explained by the following respondent:

"It is very important to know how your processes run and with which system and applications you work with in order to successfully implement RPA on these processes." (COE_3)

Besides an analyst, a robotic engineer is also needed. The engineer works closely with the analyst. When an analyst is ready with the 'pre-ready-phase' and 'ready-phase', the engineer starts building RPA as written by the analyst. After the engineer is done building, the RPA goes into the testing phase. For this, a tester is required that checks everything the analyst wrote down and the engineer has built. A tester will finetune the aspects of RPA that do not work accordingly.

Finally, based on the analysis that an analyst does with the pre-ready phase together with the team, the potential projects goes to the development teams to build the RPA. The way the development team makes sense of priority and size of a potential RPA project, is through so-called 'shirt-sizing'. The development team makes sense of the shirt-sizing concept in terms of the time duration it would take to complete an RPA project, as explained by a respondent:

"It is literally a t-shirt size from XS to XXL, on which an estimate is actually made of how long roughly the team thinks it will be working on that project. XS stands for one sprint of two weeks and XL is for ten or more sprints. So that means ten times or more two weeks, so that will be a minimum of 20 weeks and then when that is clear the project will go back to the product owner group" (Team2_2).

Summarizing the findings about cognitive participation
In relation to the way organizational actors engage with RPA implementation, a number of significant factors are mentioned in the interviews. It can be concluded that belief, confidence and trust important to be created to successfully implement RPA, both for employees and for managers. The respondents emphasise that this process of giving sense and creating an atmosphere with trust is created bottom-up. Moreover, an experimental approach to create buy-in have a positive impact on the adoption. However, these resources should be made available by managers. In focusing on this work, the availability of time and priority given by the management seem to be beneficial for actors to engage with RPA. When looking at the purpose of implementation, it turns out that clear communications have an important role, as communicating about saving costs negatively affects employee trust and involvement.

4.3 Collective Action

In this chapter it will be outlined what organizational actors identify as important factors concerning the dimension 'collective action' that are relevant for RPA implementation. Cognitive participation refers to the way organizational actors work to ensure a successful implementation of RPA. Overall, 4 codes are identified in the interviews that belong to the dimension of collective action. These are shown in the coding overview in table 7.

Dimension	Third-order codes	Definition	Example quote
Collective action	Multidisciplinary working	Importance of multidisciplinary working to implement RPA	*"We don't find robotization solutions alone, we mostly do that together with other departments." (Team2_2).*
	Connecting Lean to RPA	The way Lean philosophy is understood and integrated with RPA.	*"The starting point we have taken is that employees themselves are given the opportunity to participate. Just say the robotization of a process, from the perspective of Lean thinking, they have the most in-depth knowledge of the processes and are specialists in them." (TM_3)*
	New skills, knowledge, and competences	The emphasized skills, knowledge, and competences needed by employees to work with RPA.	*"As a result, people are released, but that will mean a new process on which they can also be used. The least, therefore, has the flexibility and the competences to move along and also to absorb new knowledge." (TM_2)*
	Facilitating mechanisms	How sense is given to facilitating mechanisms to implement RPA and propose RPA projects.	*"An employee took an average of 70 minutes to draw up a bill and we were given the assignment in a kaizen-week. As robotics we took a very small piece of the project. [..] And that now only takes an employee five minutes instead of 70 minutes" (Team1_3)*

Table 7. Coding overview collective action

Multidisciplinary working - The interviewed respondents strongly agree that RPA initiation starts from within the operational business teams. Within these departments, various organizational actors try to find opportunities to apply robotization solutions. Working multidisciplinary is considered to be essential, as shown in the following quote:

"We don't find robotization solutions alone, we mostly do that together with other departments." (Team2_2).

Furthermore, process managers seem to have an important role for creating opportunities for teams to RPA solutions. This process start initially as trajectories to signal processes that are not running properly or where the quality of processes is not good enough. Based on these trajectories, a so-called 'process scan' is started, in which once per half year these processes are scanned based on data and interviews. These process scans result in potential areas of interest for the business to deploy RPA projects. However, prioritizing these areas of interest are very important, because limited resources within the organization can cause important areas to be neglected. Depending on a number of factors, such as the number of incidents that have entered the process, the potential areas of interest for robotization are given colours to prioritize red, orange, and green, wherein red is urgent and green has a lower priority.

When looking at the potential areas of interest to use RPA, participants agree that the deployment of RPA has to fit into an organizational strategic goal. This is illustrated by the following quote: *"Our backlog includes future projects and possibly future projects, where we might want to build a robot. For example, if we want to build a robot with the business case delivered, we will be based on that business case. But we always think in the sense 'Is it actually considered okay? Which strategic goals of the organization will this contribute to?'"* (Team2_3).

Two main strategies are found to initiate RPA projects: proposals from the robotics team or COE and proposals by employees. Besides RPA projects proposed by the robotics staff department of a team, RPA can also be initiated through proposals by employees working in an operational team. Providing employees opportunity and space to initiate RPA proposals has been an effective approach, as explained by a respondent: *"As soon as employees carry out a process, they can click through to a knowledge bank. And in that knowledge bank, a process is explained step by step. If an employee has an improvement initiative or an employee wants to improve something from his perspective, then an employee can give feedback within this knowledge, and that was also often the start of a large change."* (Team2_3)

When there are sufficient improvement proposals given by employees, a so called 'improvement day' is organized, in which all proposals are assessed by multiple teams and very often directly implemented. However, respondents mention that when they recognize an improvement proposal that has a lot of impact, than they organize a "kaizen week". Within this kaizen week, various teams come together, varying from operations, robotics, process management and IT, in order to dive deep into the process. This process is also seen as the routinization of RPA, wherein these patterns become part of the existing routines within the organization.

"Together with all teams we start looking at a process without immediately thinking of solutions right away. We think for example 'how can we make that process run more

smoothly? Can we change something in the instructions, or maybe we could create a robot for a totally more efficient process?'. (Team2_2)

"A kaizen week is actually the toughest form of an improvement initiative. For a number of days, employees are sitting together in a cage preferably, to really outline the process. We look at how things are going now, ideally how it should go, and then finally create the improvement initiatives for robotics right away" (Team2_3)

Connecting Lean to RPA - All interviewed respondents indicated that the Lean philosophy is not only a basic requirement for building RPA, but rather the most important aspect when making sense of RPA. The importance of connecting Lean to RPA is crucial to enact RPA as well as successfully build RPA and neglecting Lean causes irrelevant processes to be robotized by RPA.

"The moment we get started with RPA, and we do not have a LEAN basis, we are actually robotizing waste." (TM_1)

Lean is particularly important within the context of finding processes to automate using RPA, as all respondents are aware of the importance of Lean. By using Lean, it becomes understandable for many organizational actors within Company X. If a Lean way of thinking is not present, it becomes unclear for organizational actors to find optimal processes to robotize and therefore the risk arises to robotize so-called 'waste' and will negatively influence the success of an RPA project. Respondents agree that working with a Lean methodology means trying to eliminate waste and thereby optimize processes. The following quote illustrates how a respondent makes sense of using the Lean methodology in finding solutions for RPA:

"Company X has a number of strategic goals, and we are particularly trying to contribute to the goals in terms of efficiency with the combination of Lean. Process managers in particular are very lean driven. They do it as smart, fast and cheap as possible." (Team1_1)
 "The starting point we have taken is that employees themselves are given the opportunity to participate for the robotization of a process. From the perspective of Lean thinking, they have the most in-depth knowledge of the processes and are specialists in them." (TM_3)

It can be seen that Lean is considered as essential to make sense of RPA. By providing training in Lean, the employees have the ability to recognize certain processes in which RPA can be used as a solution. As Company X sees employees as drivers for RPA implementation, Lean will increase the opportunities for RPA.

New skills, knowledge and competences - With Company X's increased usage of RPA within the departments, various new skills, knowledge and competences that are needed by employees are emphasized, specifically in context of work activities that are changing due to RPA. As RPA is mainly taking over standard, repetitive tasks of many employees, respondents

emphasize that employees are now more working with specific, more complex tasks that are not necessarily standardized in nature. However, the robots regularly have to deal with downtime due to errors. Employees who previously worked entirely on a process, now need the skills to successfully deal with RPA outages. Also, as employees perform less and less repetitive tasks, respondents from HR mention that a shift is taking place from a type of 'function' to 'roles' among employees. This influences the employability of employees, so that employees can be deployed more widely and are no longer tied to a job description. During the first wave of implementation, teams promoted employee promotion to robotics roles. Employees within operational departments played an important role in the RPA-projects related work. As can be seen from the interviews, two types of employees were highlighted for successful RPA implementation within the team: the employees that had affinity with IT that could develop themselves to build the robots, and employees that liked to re-design the processes they were working on with the aim to improve efficiency and use RPA. However, after promoting the first rounds of employees, teams recognized that people working in robotics teams needed more specific skills to successfully work with and built RPA robots. In the interviews, respondents mainly addressed the following relevant skills, knowledge and competences that are needed by employees in order to successfully work with RPA: flexibility, being open to change, affinity with IT, complex problem-solving skills, collaboration and creativity. Table 8 illustrates supporting quotes for the aforementioned relevant skillsets.

Relevant skillsets	Quote
Flexibility	*"People are released of their current tasks because of RPA, but that means a new process on which they can be deployed. The flexibility and the competences to move along and also to absorb new knowledge is important." (TM_2)*
Being open to change	*"I think it's important for the employees to embrace the change and not just embrace it because we want RPA but embrace it because we want to achieve business goals." (TM_3)*
Affinity with IT	*"They help in a process, so they will have to get a lot more IT affinity." (TM_3)*
Complex problem-solving skills	*"We see that the simple work is done by robots. The things the robots cannot do, people will have to solve themselves. So, they will have to be much better able to solve that "hassle" themselves, so complex problem solving." (HR_2)*
Collaboration	*"Keeping all knowledge to yourself is impossible in the future, which means that you will collaborate much more network-oriented, agile-oriented. (HR_3)"*
Creativity	*"Our customers will always get into crazy situations. It's about skills such as creativity, solving complex problems, displaying emotional intelligence, story-telling." (TM_1)*

Table 8. Emerging relevant skillsets

Facilitating mechanisms for RPA implementation – Two types of facilitating mechanisms for RPA project proposals are found in the interviews: improvement days and kaizen weeks. The main differences that are found by the interviewed participants regarding the improvement days and kaizen weeks, is that with an improvement day multiple processes are handled and potentially improved. However, the kaizen week is put in place to fully redesign a single process. The improvement days are mostly initiated bottom-up, while kaizen weeks are initiated top-down by management. Respondents mostly agreed that RPA is mostly seen as a sub-solution of complete process redesigns. During kaizen weeks, respondents make sense of it by stating that they "throw the entire existing process in the trash can" (Team2_2) and redesigning it completely to make it run as efficiently and effectively as possible. Here, automating parts of these redesigned processes are often initiated to keep as few manual actions by employees as possible. These differences are explained in the following quote:

"The improvement day is quite accessible. An employee simply goes to a location and discusses it with everyone, for example with a delegation from each location. It is simply discussing a number of proposals and it is actually worked out together. The kaizen is really the heaviest means we have, so that is really no longer sitting together for a morning, but that is really like three to four days of sitting together all day from nine to five completely with a blocked agenda to actually rearrange and redesign the entire process." (Team2_1)

As mentioned before, the kaizen week is initiated top-down by management. Involvement of multidisciplinary actors from various departments are found to positively influence the outcome of these kaizen weeks. Regular working employees, management, IT, top-management, and robotics teams should be involved in these kaizen sessions. The top management is responsible for the prioritization of the kaizen week. Various reasons to organize a week kaizen are found: solutions for cost reductions, increasing customer satisfaction or employee satisfaction.

"The management team looks at what they think is the most important process and there it is prioritized which week kaizen is more important than any other, so where do we put our capacity on." (Team2_1)

"The week kaizens where I have been until now, RPA has always been a kind of sub-solution, yes with the aim of ultimately working on the basis of minimal viable projects. So, we actually work on the basis of the fact that we already want to deliver business value within three months, maximum three months. We are also allowed to spend a maximum of three months on the first version of a robot." (Team2_2)

Summarizing the findings about cognitive action

In relation to the enacting work that respondents mentioned in the interviews, a number of significant factors are mentioned. The respondents emphasize that multidisciplinary working

on implementing RPA enhances successful implementation, as actors from multiple organizational levels are needed. This multidisciplinary working includes multiple disciplines, for example regular employees, team robotics, various different departments, as well as multiple hierarchical levels like employees, managers, top managers. If individuals at one level in the organization (typically employees working in operational departments) have gone through operational processes with a Lean way of thinking, the next level picks this up and continues in a sense that the ideas move to another level, the so-called facilitating mechanisms 'improvement day' or 'kaizen week'. Moreover, the skillsets of the people working with RPA and the people building RPA are also found to be important, as lacking skills negatively influences RPA outcomes. The following skills and competences are found to be important: flexibility, openness to change, IT affinity, complex problem-solving skills, collaboration, creativity.

4.4 Reflexive Monitoring

In this chapter it will be outlined how organizational actors assess and understand the way RPA affects them. Overall, 3 codes are identified in the interviews that belong to the dimension of reflexive monitoring. These are shown in table 9.

Dimension	Third-order codes	Definition	Example quote
Reflexive monitoring	Process complexity	How sense is made of the importance of the complexity of processes when implementing RPA.	*"You notice that you reach a point in which you have to make that professional step as a real IT department. In the beginning, that pioneering is still okay, but at a certain point we also said: 'well, we just need to be much more professional.' So, we will monitor every day whether the robots that we have put live are still in the air." (Team3_1)*
	Effective design support	How respondents understand the sensitivity of RPA towards its integrated IT systems.	*"The butcher does not inspect its own meat, so the engineer who has built the robot is not allowed to test it himself. We have a different engineer who tests the work of his colleague." (Team1_1)*
	Assessing value	How the value of RPA per robot is assessed to reflect on its performance.	*"[..] from this robot, robotics team of other departments also learn a lot: how you can apply this again in other departments and use this as a foundation." (Team3_3)*

Table 9. Coding overview reflexive monitoring

Process complexity - Respondents highlighted challenges regarding the integration of RPA within the IT architecture of Company X. As previously mentioned, RPA implementation within the Company X has a business-driven approach instead of an IT-driven approach. That means that all RPA projects are initiated and the focus on finding suitable RPA projects and the building of these RPA projects are realized within operational business departments. However, as the number of total RPA robots and the usage has grown enormously, respondents expressed concerns regarding the architecture and the desire to build and use RPA more professionally. As mentioned by a respondent, a key reason to professionalize the implementation of RPA was to be aware of process complexity, meaning that actors should understand the steps during a work process, functionality, and safety. As Company X started making hundreds of robots in a short timeframe of a few years, it is seen important to understand the process complexity and monitor the robots accordingly.

"You notice that you reach a point in which you have to make that professional step like a real IT department. In the beginning, that pioneering is still okay, but at a certain point we also said: 'well, we just need to be much more professional.' So, we will monitor every day whether the robots that we have put live are still in the air." (Team3_1)

Effective design support - Respondents believe that RPA is very sensible towards existing IT systems that it is integrated with. Small changes within these IT systems cause the robots to malfunction. For example, when a system changes its content, it causes the robot to fail as the robot does exactly as planned and has no cognitive intelligence yet. The way Company X identifies potential problems in RPA, is by making the COE responsible for reviewing RPA robots before going live. Here, quality guidelines are put in place and checked to identify all pitfalls in the robot. The reason why the COE does the quality control, is that the RPA builders believe they would lose sight over small details over time when working on a robot. Here, effective design support relates to the availability of technical support by a centralized department, the COE.

"The butcher does not inspect its own meat, so the engineer who has built the robot is not allowed to test it himself. We have a different engineer who tests the work of his colleague." (Team1_1)

Technological tools to assess value - The way organizational actors determine how useful an RPA robot is, is by building dashboards which show the time-equivalent of tasks that it would normally take if it would be done by a regular employee. These dashboards provide transparency and makes it easy to see how much a robot contributes in value. Lastly, previously build robots are often used as a basis for new robots that have to be built. This way, organizational actors can redefine and modify existing practices with the robot: "*[..] from this robot, robotics team of other departments also learn a lot: how you can apply this again in other departments and use this as a foundation." (Team3_3)*

Summarizing the findings about reflexive monitoring

In relation to the way respondents assess RPA, a number of significant factors are mentioned. Respondents emphasize the importance of appropriate RPA building, as processes can be very complex and could potentially crash when there are errors. Moreover, support in its design is also highlighted as importance and can be achieved by an overarching Centre of Excellence department that looks at the guidelines and serves as a technical supporter. Finally, respondents mention the importance of being able to assess RPA value in terms of time-equivalency.

In summary, it can be concluded that all four dimensions (coherence, cognitive participation, collective action, and reflexive monitoring are interdependent and consequently related to each other. However, the importance of each dimension differs. To elaborate, the implementation starts with bottom-up sensemaking for a clear understanding of the work of implementing RPA. This aspect has a central role within coherence. It further goes to bottom-up sensegiving towards management in order to get support and top-management buy-in, which explains the way actors engage with RPA in the dimension cognitive participation. Collective action, on the other hand, is essential to enact RPA, for example by multidisciplinary working and the requirement of new skills. Table 10 represent a summary of the interpreted findings for the dimensions coherence, cognitive participation, collective action, and reflexive monitoring, that are relevant for RPA implementation.

Sensemaking and sensegiving for the implementation of RPA			
Coherence	**Cognitive Participation**	**Collective Action**	**Reflexive Monitoring**
-Difference between RPA and traditional IT -Framing differentiating factors -Value, benefits, importance -Personification of RPA -Celebration of go-lives -Engagement of employees -Encouraging employee involvement	-Intrinsic belief -Confidence and trust -Purpose of implementation -Experimental approach -Top-management buy-in -Need for new roles	-Multidisciplinary working -Connecting Lean to RPA -New skills, knowledge, and competences -Facilitating mechanisms	-Process complexity -Effective design support -Assessing value

Table 10. Summary of the interpreted findings

5. Discussion and implications
5.1 Discussion of findings

In the discussion, the findings derived from the data are interpreted. This study began with a research question unanswered by the RPA implementation literature. The research question concerns how organizational actors make and give sense of RPA during the implementation process. To answer this question, current literature has been reviewed regarding RPA, implementation processes and sensemaking. To understand the RPA implementation, I interpret the findings along with the theoretical framework based on both the normalization process theory and sensemaking theory. This framework has been used to get a better understanding of how a technological implementation is normalized or embedded by organizational actors. Furthermore, additional literature is used to discuss findings which aren't discussed in the literature before.

The four-stage process of envisioning, signaling, revisioning, and energizing of Gioia and Chittipeddi (1991), in which they describe a pattern of sensemaking and sensegiving going back and forth, has also been found in this study. Sensemaking and sensegiving efforts between organizational actors continuously went back and forth starting through bottom-up initiation and top-down sensemaking. As opposed to the study of Gioia and Chittipeddia (1991), in which sensegiving efforts starts top-down, in this case study the initiation and sensegiving started bottom-up towards the management. Sensemaking efforts first went into the differentiating factors of RPA when comparing with other traditional IT solutions by regular employees – the change initiators, who made sense of RPA in order to give sense to top management. This resulted that sensegiving is done with the aim to firstly persuade management to receive support in the form of time and resources.

It is found that the sensemaking and sensegiving practices while implementing RPA through the four dimensions (coherence, cognitive participation, collective action, reflexive monitoring) are occurring concurrently. For example, making sense of the benefits is only done after the steps taken in cognitive participation and collective action. These processes are therefore found to be dynamic and ongoing practices. This shows that sensemaking and sensegiving efforts are important during the whole implementation process, and not just at the initiation phase. Early on, Hill (1995) explained in his paper regarding the importance of using metaphors in the process of sensemaking and sensegiving for effective implementation. Our findings reflect that human personification of RPA results in positive perceptions among employees, wherein this goes further than metaphors, resulting in the technology being humanized. However, using the personification without creating awareness is also found to be negatively affecting top management, as they oversimplify RPA. Moreover, the findings reflect that employees get frustrated when an RPA robot malfunctions, and this could also negatively affect the positive perceptions created by the personification of RPA. This also relates with Klein & Hirschheim (1991) regarding the concept of communicative rationality having immediate applicability to systems development. Klein & Hirschheim (1991) argue that mutual understanding among participants is highly important, and "communication

breakdown - the failure to achieve consensus by misunderstanding or mistrust – is a major contributor to systems development failures" (p. 165).

Even with a bottom-up approach of implementation, it is found that without management support, a successful implementation of RPA is not possible. Persuading efforts towards top management is done by demonstrating small pilot projects. With RPA implementation, this differs from other IT implementations as RPA can be configured quickly with the purpose to demonstrate its effects towards management. Management will only put in effort in creating an implementation climate wherein operational teams have the time and resources to further implement RPA when management is persuaded and aware of RPA and its benefits.

Involvement and engagement of employees positively influences the successful implementation of RPA. Various sensegiving mechanisms have been found that facilitates employee involvement. One is the celebration of RPA launches. Teams that host a celebration attract many employees, both from their own teams as well as other departments within the organization. This again creates sensemaking by employees, as the goal is to further implement RPA across other departments. Managers thereby play a role in engaging in the development of employees. By creating a climate wherein managers provide employees with opportunities to improve their skills and develop themselves, the implementation climate is improved. This is also in line with Klein and Sorra (1996) that state that "a strong implementation climate fosters innovation use by ensuring employee skill, providing recourses for innovation, and removing obstacles and disincentives for innovation avoidance." (p.1060). This is also found in our findings, as managers have to allocate time and resources for employees to work on RPA implementation and thereby removing the obstacles. Also, management facilitates training and employee promotions for implementing RPA, and this has led employees to take on the new formed robotics roles and participate in the trainings in the early stages of implementation.

The reason why Company X has been able to successfully build and implement over 300 RPA robots, is because of the committed and enthusiastic belief of both employees and managers. This has been done by continuously promoting RPA with success stories. By showing that work indeed gets easier and more fun to do for employees, many employees started seeing the benefits. This caused RPA to be congruent with their own beliefs and values, as Klein and Sorra (1996) also suggest as *internalization*.

What is also remarkable, is that all organizational actors have linked Lean to RPA. Lean implementation originates from the improvement strategies of Henry Ford, which was later modified and redesigned by Toyota into their Toyota Production System (Womack & Jones, 1996). Although it was mainly used in the manufacturing industry, Lean is now also common in many other administrative and service providing sectors. The main idea behind Lean implementation is to improve operational efficiency by reducing cost, time and increase quality (Holweg, 2007). This is very much aligned with the way organizational actors make sense of RPA, namely improving operational efficiency.

5.2 Practical implications

This study provides insights for organizations and practitioners who are interested in implementing RPA. The results of this study imply that differences in the way sense is made and given about RPA exists. Organizations could benefit from the way they communicate about RPA. Our results show that the personification of RPA has positive effects on the way employees feel about RPA. However, organizations should be cautious, as our results show that the personification can negatively affect the way managers think about it. For example, it can cause oversimplification or diminishing interest. Based on the results of this paper, we also suggest organizations to start with small pilot projects when implementing RPA. By doing that, RPA benefits can be shown to stakeholders and thereby awareness and involvement can be created. Celebrating the launches of RPA robots results in positive promotion and awareness through the firm, so organizations may benefit from celebrating the launch of RPA. Moreover, based on the results of this paper, we suggest organizations to provide training in Lean, as our results show that the integration of Lean with RPA has shown better understanding of RPA and thereby making it an important facilitating mechanism for successful RPA implementation. Finally, creating a centralized centre of excellence within the organization would mitigate the risks associated with RPA, such as malfunctions and data security.

5.3 Theoretical implications

This research offers several theoretical implications. First of all, studies about sensemaking and sensegiving have mostly researched top-down changes in organizations. However, in this study the implementation process of RPA is initiated bottom-up instead of top-down. Also, previous described literature regarding patterns in sensemaking and sensegiving by Gioia and Chittipeddi (1991) are found in this study as well. However, while Gioia and Chittipeddi (1991) considered top-down change only, this research found the same concept on bottom-up change. Previous studies also show that changing sensemaking and sensegiving efforts can also lead to different sensemaking results (Maitlis, 2005). A key insight from this study is that sensemaking and sensegiving efforts vary as the communication towards top management about RPA and towards employees are different. To elaborate, sensegiving towards employees by communicating that RPA is a tool that is used to save costs has a counterproductive effect. What we have learned in this study is the positive effect sensegiving efforts went towards employees regarding the personification of this technology. For the employees, the way they made sense of the personification goes further than using metaphors as explained by Hill (1995), it goes to a level where the technology is humanized by seeing RPA as a new-born baby that goes into development phases. In this sense, employees gave the RPA robots a human name and treated it as a colleague. However, this approach to giving sense leads to a different sensemaking result by management, who tends to oversimplify the technology and potentially lose interest to buy-in. This shows that there is a recursive sensemaking and sensegiving process across hierarchical levels and functions and happens in sequence as was also identified by Gioia and Chittipeddi (1991), however the

bottom-up approach caused more focus on gaining top support first in order to advance in the implementing process. So, a key insight is that the bottom-up sensegiving focuses very much on persuasion towards management. This is interpreted in the findings, as managers in this study have tended to quickly lose interest when an RPA project failed in the beginning of the implementation process. Kezar and Lester (2011) also describe that bottom-up changes need more constant support as they can be more fragile.

Furthermore, what stands out in this study and what we can learn from is the way essential activities contributed to the implementation of RPA. First of all, this study demonstrated that celebrating successes to give sense towards employees, managers, and other departments and the way these actors make sense promote the implementation within the organization. Promoting the use of RPA in a positive way by celebrating and making others enthusiastic about it has contributed a lot to the implementation. As shown in the study, this approach to sensegiving help people see and understand what RPA can do and how they can also involve in the implementation process. Sensegiving has been very strategic to achieve support and overcome potential barriers in the implementation.

Another original contribution of this study is demonstrating that sensegiving and sensemaking is not only important in the early stage of implementation, but also in further stages to create new roles wherein multidisciplinary and multi-level teams work together by creating facilitators and overcoming barriers. One of these facilitators is the incorporation in existing initiatives such as lean management and continuous improvement. In creating a culture wherein lean is integrated to existing processes, actors are given sense that RPA contributes to and is a part of the existing Lean management. This way of sensegiving creates a familiarity with RPA among organizational actors and contributes to the way they make sense of it. Facilitating mechanisms like the improvement days and kaizen weeks, which are also part of the Lean management, positively influences the way actors make sense of it and causes involvement which is needed for the implementation.

5.4 Limitations and further research

We acknowledge that this study also has its limitations. Due to the qualitative nature of the study, the first limitation is in terms of its generalizability. As the findings are based on a single case study, it may limit the applicability of interpreted findings to be extended to wider populations or other contexts. For example, this study has indicated that employees and management are rather sensitive to the way sense is given regarding RPA by personification of the technology. It might be the case that other, non-financial services organizations, show different results and may rely less on the way sense has been made and given in this context. By performing this study solely in a single, big financial services firm, this may therefore limit the applicability of our findings to other organizations and industries. Therefore, we suggest further research to conduct multiple case studies in different industries and organizations to look for similarities and differences. A second limitation is that the data collection of this study is only focused on semi-structured interviews and could not rely on observations. The reason for this is that this study was performed amidst the outbreak of the global Covid-19 pandemic,

making real-life observations impossible. We regard this as a limitation, because the research is regarding sensemaking, and sensemaking occurs through both verbal and non-verbal means (Gioia & Chittipeddi, 1991). Observing how organizational actors engage and exchange stories, experiences, and observing their behaviour would have enriched the way we interpreted the findings. However, by gaining a good number of respondents (22 semi-structured interviews through virtual meetings and 20 respondents for the open-ended questionnaires) and reassuring the participants of confidentiality and anonymity, we got an in-depth look at how organizational actors looked at the situation. A final limitation is the fact that a few managers provided the list of other respondents that were interviewed. This might have resulted in a group of respondents that are biased as managers may propose other favoured respondents who share the same ideas regarding RPA. However, by elaborating our criteria for respondents to be interviewed prior to the managers' selection of respondents, we have gotten a list of respondents that indeed match the criteria and some respondents were giving very contradicting information compared to the management. This may suggest that the bias was limited.

6. Conclusion

This research has been able to give a first insight in how organizational actors give and make sense of RPA during the implementation process. To the authors knowledge this is the first study within the field of RPA implementation context that has sought to understand organizational actors sensemaking and sensegiving efforts using the sensemaking and NPT theory. In using NPT to provide an in-depth understanding of sensemaking and sensegiving mechanisms influencing the implementation of RPA, this study has highlighted the underlying mechanisms that characterize the implementation of RPA. The results show that organizational actors use various sensemaking and sensegiving mechanisms for RPA in the implementation process. They further show that employees and managers having conflicting beliefs adversely affected implementation, resulting in managers either not buying into RPA or having over expectations of its possibilities. The results of this study demonstrate various ways of sensemaking and sensegiving that were important for the implementation process of RPA, like the personification of the technology, the promotion of the implementation by celebrating successes, the recursive sensemaking and sensegiving across hierarchical levels and functions and the incorporations of existing initiatives such as lean and continuous improvement with RPA. These were facilitated by the efforts made in sensegiving and sensemaking to create a shared understanding and contribute to the implementation of RPA.

Appendix

Appendix 1. Questionnaire employees

"Hello! Thank you for taking the time to participate in this short questionnaire.

Purpose of the investigation.
Rabobank has been working on robotization through Robotic Process Automation (RPA) for some time now. These software robots are now used in many different organizational units and teams. That is why we think it is important to look at how employees experience this form of robotization and what the impact of these RPA robots is on employees, so that Rabobank is able to continue to use RPA in the future.

Approach
This is an exploratory and qualitative study, in which we look at the significance of the change / deployment of RPA for employees within the organization through interviews and questionnaires.

Confidentiality
All answers to the questions are recorded completely anonymously and are only used for the purposes of the research. The answers are not shared directly with external parties and / or Rabobank.

Contact details researchers
- Mehmet Tasdogan (MSc. Student, University of Twente)
m.e.tasdogan@student.utwente.nl
- *left out due to privacy measures*

The questionnaire takes about 10 to 15 minutes. Participation is voluntarily and you may choose to withdraw from the questionnaire at any time. There are no right or wrong answers!"

Questions:
- Function
- How do you experience the use of robotization (through RPA) for your work?
- How has your work changed through the use of robotization (RPA)?
- How did you experience the introduction of the use of robotization (RPA)? And why do you use robotization for your work?
- What expectations did you have for using robotisation for your work?
- What is your opinion on the use of robotization for your work?
- How do you think robotisation will affect your work in the future, and what do you need to remain successful in your work?
- How long have you been working at Rabobank? (year / month)

Appendix 2. Interview protocol

Interview questions

- What is your position at Company X?
- How many years of experience do you have in this field and what is your background?
- How would you describe your role in this organization (responsibilities, work tasks)?
- Why was RPA introduced and why is it used in the organization?
- What do you think about using RPA and what were your expectations for using RPA for your work?
- How is RPA introduced and implemented within your team?
- How do you communicate about RPA within the team and with other teams?
- How are employees convinced to use and work with RPA?
- How can RPA best be used?
- What are the problems and challenges in managing and deploying RPA?
- What is the difference between managing RPA and another IT software?
- Who decides where RPA will be used? What criteria do you use for this?
- What are your experiences with the use RPA in your work?
- How do you describe the collaboration with RPA?
- How have things changes after RPA was introduced to your team?
- How have you adapted to this situation?
- What knowledge and skills do you need to be able to work in a team with RPA?
- How has the performance of you personally and your team changed after the introduction of RPA?
- What is your vision for managing / working with a team that works with RPA?
- How did you experience the support from the organization regarding the introduction of these robots -> follow-up: what had a positive influence and what possibly had a negative influence?
- What does it take to be and to remain successful using these RPA robots?
- How do you see the future of your work and your team in the context of the developments around RPA?
- How could your organization support in this? Follow-up -> what do you expect from a manager?
- What criteria must the robot meet in order to work successfully in a team?
- How does the purpose of the robot play a role in the performance of a team?
- How should the organization support the use of a robot in a team? What are important factors in supporting?
- Can you give me an example where the use of RPA has gone well and one where it has gone wrong?

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