Benefits and Challenges of Robotic Process Automation

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Abstract: Digitalization has been shaping the ways how we work and live for a considerable length of time. Businesses' competitiveness is partially determined by their capability to adopt and leverage new technologies. One of the latest trends in digitalization is the automation of repetitive, low-cognitive human tasks in white-collar jobs. A tool that was created to automate low-cognitive human tasks, Robotic Process Automation utilizes software robots to address this topic. RPA gains attraction because it is easily scalable, and implemented at a rather low cost and the use of it doesn't require prior programming skills. This research relies on existing literature and identifies the benefits and challenges of Robotic Process Automation.

1 INTRODUCTION

Almost all aspects of our lives have become digital, and the trend continues – not least, the way of doing business is in constant change due to digital development (Reis et al., 2018). The emergence of new digital tools has enabled businesses to improve their efficiency, and accuracy, and reduce costs (Osman, 2019). Recently, the automation of repetitive human tasks (Leshob et al., 2018) and non-value-adding activities in a scalable manner has attracted increasing interest from corporates (Hofmann et al., 2020). A set of tools that meet these requirements are Robotic Process Automation (RPA) tools which take over the above-mentioned repetitive manual processes by robots created for this purpose (Fantina et al., 2021). RPA tools can be defined as "a business process automation system that uses software tools to interact with existing applications and re-place humans" (Fernandez & Aman, 2021).

This study aims to understand what the benefits and challenges are offered by RPA. We are especially interested in studying Sales support work activities can be digitalized with RPA. The potential of RPA in enhancing operational excellence and fostering digitalization in Sales support can be very important aspect to study. This paper is written as a position paper that paves the way for a comprehensive model of RPA implementation in Sales support.

In the following chapter the aim is to show the conceptual basis of RPA. Chapter 3 presents the literature setting, benefits and challenges of RPA, mainly in general but also from Sales support point of view. Finally, in the chapter 4, some future thoughts of the phenomenon.

2 ROBOTIC PROCESS AUTOMATION

Automation of business processes is not a recent phenomenon: starting at least from the 1990s organizations have tried to figure out, what tasks should be automated and what tasks to be performed by humans (van der Aalst et al., 2018). The dominant approach for automating business processes has been Business Process Management (BPM) which is an umbrella concept for techniques and methods aiming to organize business processes in an efficient manner (Mendling et al., 2018). BPM is a large portfolio of practices used also for finding solutions for process improvement and decision support (Osman, 2019). BPM automation systems rely on the classical "inside-out" approach to improve processes, meaning that the new system is developed from scratch and integrated into the existing IT infrastructure, often

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requiring some tuning of the existing systems as well (van der Aalst et al., 2018). This makes BPM projects quite expensive, and the use of BPM tools needs extensive programming expertise from users (van der Aalst et al., 2018; Lacity & Willcocks, 2016b). Due to the costly implementation, it is best to have many cases with a similar structured process to make the automation economical. This limits the applicable use cases of BPM to only a few even though there is usually a lot of repetitive work suitable for automation in an office environment, but which is not frequent enough to justify automation cost-wise. (van der Aalst et al., 2018) That is where RPA comes in: a tool with the primary focus on automating tasks which can be deployed with little investment (Osman, 2019).

RPA aims to automate existing processes performed by humans using existing applications making it feasible for cases that wouldn't work with BPM (Lacity & Willcocks, 2016b; Osman, 2019). The Financial Express (2016) defines RPA as a set of automation software tools utilized by companies for repeat processing and low-end tasks without human involvement (Fernandez & Aman, 2021). Along with other newer business process automation approaches it has emerged due to the advancements in the field of Artificial Intelligence, Machine Learning and distributed systems which have provided the foundation for new automation technologies (Mendling et al., 2018). RPA technology is based on software robots (Engel et al., 2022). Typically, robots remind us of physical electromechanical machines, but those can be also software-based as in this case; a robot is just any kind of machine that replaces a human resource (Lacity & Willcocks, 2016a). Software robots will take over a big share of white-collar jobs in the same way that physical robots have replaced blue-collar jobs (Madakam et al., 2019). Robots can have a different basis for action: RPA works on rules-based robots but there are also learning-based robots which improve by learning from data. Automation that is implemented using learning-based robots is called cognitive automation. (Engel et al., 2022)

While BPM relies on an "inside-out" approach, RPA uses the opposite "outside-in" approach where the existing information systems remain untouched, enabling implementation with little investment. RPA requires only lightweight IT implementation, meaning that it acts at the graphical user interface (GUI) -level and is driven by non-IT employees whereas tools requiring heavyweight IT the implementation is driven by IT experts. (Engel et al., 2022; Osman, 2019).

RPA must be consistent with the organization's IT governance and thus it cannot be totally outside the control of the IT department. (Lacity & Willcocks, 2016b) RPA software is "non-invasive", meaning that there is no need to develop extensive platforms to acquire RPA, but it just sits on top of existing systems (Fernandez & Aman, 2021; Lacity & Willcocks, 2016b).

RPA works with structured data, which means that the data is organized in a consistent structure that allows running queries on it to retrieve information for organizational use; the data has a definite format and length, and it is easy to store (Eberendu, 2016). The type of data is important as RPA cannot process unstructured data, such as images and emotions (Desai et al., 2021) but cognitive automation tools can. Structured data can be processed and analysed using statistical and mathematical methods (Rabin et al., 2020), which fits the rules-based operating principle of RPA. According to Osman (2019), the quality of data is a vital aspect of RPA applications to ensure the correct functionality of the robots. This also sets a boundary condition for the tasks to be automated as all data must support the same format and be electronic (Osman, 2019). If data comes from different sources and with different labels, it needs to be standardized before RPA usage (Moffitt et al., 2018). In general RPA implementation is less risky with standardized and mature processes, meaning that the process is stable, and results are predictable (Leshob et al., 2018). Tasks that require human judgement and have uncertain outcomes are better for probabilistic approach-based automation ((Moffitt et al., 2018).

So, feasible processes to be taken over by RPA are rules-based, non-complex, standardized and executed in high volumes (Moffitt et al., 2018; Rutschi & Dibbern, 2020). It remains to be clarified, how RPA works. Syed et al. (2020) state that RPA robots mimic human behaviour, following the manual path taken by the user through a range of computer systems to perform a certain business process. The robots can be seen as digital workers each of which is using its own username and password to access systems, similar to human employees (Kokina & Blanchette, 2019). RPA robots work autonomously by interacting with multiple systems and making easy, binary decisions that don't require intelligence unless RPA is enriched with AI features which enable more complex decision-making (Kokina & Blanchette, 2019; Syed et al., 2020). Simple RPA mimics human behaviour whilst cognitive automation mimics or augments human judgement (Hegde et al., 2017). RPA and cognitive automation tools are also highly synergetic when used together and when used in tandem the automation possibilities are extended (Lacity & Willcocks, 2018, pp. 57-58). In this study, we focus on the traditional, non-AI enriched version of RPA as it is where organizations often start automating their processes (Lacity & Willcocks, 2016a).

RPA communicates with the other systems the same way as humans do, so via the front end while traditional software communicates with other systems via the back end and data layers (Asatiani & Penttinen, 2016; Kokina & Blanchette, 2019). RPA works based on pre-defined rules which follow the routine of a human employee performing the task (Flechsig et al., 2022; Rutschi & Dibbern, 2020).

All processes have exceptions which must be considered in the process design as the robot follows the rules unwaveringly and in case of an exception, it is unable to process if an exception handling is not determined. Despite careful design, no application will run smoothly all the time and that's why the robot must indicate somehow, e.g., by sending an email to the responsible person that it has completed its task (Fantina et al., 2021). The rule of thumb is that one robot performs one process and once the process has been fully implemented in the robot no changes will be made unless an error occurs or the environment changes (Lacity & Willcocks, 2016a).

An archetype of an RPA task is transferring data from one source to another. Often the input is processed – again, based on the rules – and the result is entered into some other software system (Engel et al., 2022). These kinds of processes are in many sources (e.g., Engel et al., 2022; Lacity & Willcocks, 2016b; Syed et al., 2020) described as "swivel-chair" -like tasks, which do not require human intervention, so mechanical and repetitive work with little or no need for human intervention. Clarity of the process helps also in the development of automation, which can be done by the employee whose tasks RPA will take over. Lacity and Willcocks (2016b) describe RPA development as a "drag and drop" -process since the users don't need to write code but only drag and drop icons and the code is automatically generated in the background. Some RPA software also allows automation to be developed using a record function, which records the user performing the task and based on the recording generates the automation logic for a robot (Moffitt et al., 2018).

Even though RPA development doesn't require specialized programming skills, it requires an understanding of information system functionalities, such as the structure of rule-based logics (loops, conditions and so forth), the use of data and the interfaces of the applications used in automation. That's why it is often beneficial that business operations and IT functions cooperate in RPA development. (Hofmann et al., 2020)

3 IMPACTS OF ROBOTIC PROCESS AUTOMATION

Because RPA is non-invasive technology (Madakam et al., 2019) which is implemented on top of the existing IT infrastructure requiring no changes in the existing systems, it is quite cost-effective to adopt (Asatiani & Penttinen, 2016; Engel et al., 2022). In comparison with other automation alternatives, RPA has very competitive adoption costs and shorter implementation time and maintaining costs are relatively cheap enabling savings in an organization's total IT service spending (Asatiani & Penttinen, 2016; Fung, 2014). After RPA implementation there will be cost-savings also from human resource-related costs: depending on the source, RPA is claimed to cut 20–50 % (Syed et al., 2020) or even up to two-thirds (Fung, 2014) of staff-related costs, compared to a situation where all manual tasks are performed by a human. The numbers are based on robots replacing full-time equivalent employees (FTEs) and one FTE is equal to one employee working full-time on a task (Asatiani & Penttinen, 2016; Syed et al., 2020).

Asatiani and Penttinen (2016) suggest that RPA might also possess an alternative to traditional outsourcing of non-core and routine activities. Both options help to reduce human resource-related costs and focus on core operations, but whilst outsourcing has some hidden costs of management and problems with complex service level agreements, RPA enables eliminating these challenges and keeping the benefits. (Asatiani & Penttinen, 2016; Fersht & Slaby, 2012; Madakam et al., 2019) Robots are also not limited by working hours but are available around the clock with lower costs than human workforce (Driscoll, 2018; Fung, 2014; Syed et al., 2020) which has positive impacts on productivity (Asatiani & Penttinen, 2016).

Cost-savings are part of the improved operational efficiency achieved with RPA. Other metrics of efficiency are a reduction in time and manual workload and increased productivity. These factors have a positive interdependence as the reduction of manual tasks leads to better time efficiency in terms of reduced waiting time, task handling time and so forth. (Syed et al., 2020) Improved operational efficiency together with all of its three cornerstones – cost-savings, reduction of time and manual work – are generally recognized benefits of RPA in the field of research and named one of the main reasons why organizations should consider RPA adoption and also why business managers see it as a very lucrative way of improving key performance indicators (Fung, 2014; Gotthardt et al., 2020; Hofmann et al., 2020; Januszewski et al., 2021; Leshob et al., 2018; Syed et al., 2020). The reduced manual workload is also considered to have positive impacts on the personnel as they are freed from repetitive and tedious tasks to more complex and value-adding activities (Hofmann et al., 2020; Leshob et al., 2018; Syed et al., 2020) which is believed to improve employee morale (Madakam et al., 2019). Capable human resources allocated to more engaging and interesting work contributes also to improving efficiency (Madakam et al., 2019; Syed et al., 2020).

Replacing humans with robots helps organizations improve accuracy and quality (Driscoll, 2018; Rutschi & Dibbern, 2020). "Swivel-chair" tasks including accessing multiple systems and transferring data from one system to another make good candidates for RPA and these kinds of tasks are also prone to errors (Fung, 2014). According to Das and Dey (2019), RPA can eliminate human errors when the process and implementation are done properly. Also Syed et al. (2020) claim that with RPA deployment amount of human errors is decreased and automated tasks are expected to achieve 100 % accuracy. Also, Fung (2014) and Madakam et al. (2019) recognize that better accuracy and fewer errors can be achieved with RPA deployment, but they refrain to give any precise numbers of improvement. Robots can achieve better accuracy while working at a much higher speed than humans and don't get tired like humans, meaning that robots are simply able to outperform humans in certain types of tasks (Costa et al., 2022; Rutschi & Dibbern, 2020). An advantage compared to the human resource is also the fast scalability of capacity based on the need, so the workload of robots can be easily up- or downscaled based on business demand (Das & Dey, 2019; Fersht & Slaby, 2012; Hofmann et al., 2020; Syed et al., 2020).

One more benefit of RPA is the ease of configuring the automation which doesn't require programming knowledge (Lacity & Willcocks, 2016a; Madakam et al., 2019) but the RPA vendors provide an intuitive user interface where the RPAs are built by arranging a sequence of modules and control flow operators to match the business process rules and logic (Hofmann et al., 2020). This allows the responsible business process people to design the automation themselves. The automated processes are also not limited to one business, but process owners can re-use the execution logic created (Hofmann et al., 2020). According to Lacity and Willcocks (2016b), this non-IT staff can be trained to design automation within just a few weeks which fosters faster implementation (Osman, 2019). The control over the process remains also within the business function or unit and reduces the dependence on central IT services (Fersht & Slaby, 2012). The overall control over the business process also improves when transferred from humans to robots (Syed et al., 2020).

Several sources also raise the improved data quality in terms of accuracy, consistency and compliance and data security as one RPA benefit (Fung, 2014; Januszewski et al., 2021; Leshob et al., 2018; Siderska, 2021). To get a comprehensive understanding of the positive impacts of RPA, the above-listed benefits and respective sources are gathered in below Table 1.

Table 1: Benefits of RPA.

BENEFITS	SOURCES
Lightweight IT implementation	Asatiani & Penttinen, 2016; Fung, 2014; Lacity & Willcocks, 2016b;
Cost-effectiveness	Asatiani & Penttinen, 2016; Das & Dey, 2019; Hoffman et al., 2020; Januszewski et al., 2021; Lacity & Willcocks, 2016b; Rutschi & Dibbern, 2020
Alternative to traditional outsourcing	Asatiani & Penttinen, 2016; Lacity & Willcocks 2016a; Syed et al., 2020
Improved efficiency	Cooper et al. 2019; Fung, 2014; Gotthardt et al., 2020; Hofmann et al., 2020; Januszewski et al., 2021; Leshob et al., 2018; Siderska, 2021; Syed et al., 2020
24/7 availability	Costa et al., 2022; Fersht & Slaby, 2012; Syed et al., 2020
Improved employee morale	Madakam et al., 2019; Siderska, 2021; Syed et al., 2020
Low error rate	Cooper et al. 2019; Fung, 2014; Das & Dey, 2019; Fernandez & Aman, 2021; Madakam et al., 2019; Siderska, 2021; Syed et al., 2020
Scalability	Das & Dey, 2019; Fersht & Slaby, 2012; Hofmann et al., 2020; Siderska, 2021; Syed et al., 2020
Easy to configure	Lacity & Willcocks, 2016b; Hoffman et al., 2020; Siderska, 2021
Improved control over business process	Fersht & Slaby, 2012; Syed et al., 2020
Higher quality and security of data	Januszewski et al., 2021; Leshob et al., 2018; Siderska, 2021

A coin has two sides and RPA also has its risks and challenges in addition to the benefits listed in Table 1. One central challenge is that RPA currently is only suitable for certain types of tasks and processes (Asatiani & Penttinen, 2016; Fernandez & Aman, 2021). Identifying appropriate processes suitable for RPA requires skills and a correct approach, which is not always so straightforward (Fernandez & Aman, 2021; Siderska, 2020). Keeping in mind the elements of a suitable task for RPA and avoiding choosing complex and subjective processes for automation, at least at the beginning of the organization's RPA journey, it's possible to mitigate the risk (Fernandez & Aman, 2021; Rutaganda et al., 2017). Being a recent technology, RPA lacks a proven track record compared to traditional outsourcing (Asatiani & Penttinen, 2016), for instance, which makes it hard for organizations to choose the best approach to evaluate the tasks in their situation (Costa et al., 2022).

Interestingly, Fernandez and Aman (2021) name data security and privacy as the main issue of RPA while some research stated that RPA implementation improves data security and privacy (e.g., Leshob et al., 2018; Siderska, 2020). Fung (2014) claims that RPA lowers the risk of unauthorized data access and thus improves data security and governance. Higher compliance to data regulatory requirements can be achieved through process transparency and traceability and reduced error-level. (Fung, 2014) Also Moffitt et al. (2018) see that RPA can improve security as human interaction with sensitive systems is decreased and processes are better monitored. On the other hand, robots handling data constitute risks especially regarding hacker attacks according to Flechsig et al. (2022). The robots will log into systems using company credentials and thus have access to passwords which has a potential risk for unauthorized access if not properly secured. Also, if mistakes are made during the configuration of robots, it can cause serious errors throughout the systems it has access to and a malicious robot may execute tasks harming the organization. (Fernandez & Aman, 2021) Companies that wish to automate processes handling confidential client data (e.g., in the accounting industry) might face customer reluctance to use RPA software because they have concerns about data security (Cooper et al., 2019). However, these risks do not only concern RPA but any IT system and countermeasures to mitigate the above-mentioned risks are readily available and continuously developed (Gotthardt et al., 2020).

The type of data poses an issue for non-AI enriched RPA, as it requires data to be of a structured type and stored digitally (Costa et al., 2022). RPA cannot process unstructured data, such as scanned documents, which make up to 90% of all data. As a consequence, companies have to feed RPA with process data in a correct form which maintains low-value tasks for employees. (Gotthardt et al., 2020) Cognitive automation tools are capable of handling and processing unstructured data but in this study's context the technological constraints of RPA have to be followed and tasks including the processing of unstructured data are not suitable to be automated with RPA as such. (Gotthardt et al., 2020; Hegde et al., 2017)

Asatiani and Penttinen (2016) and Fernandez and Aman (2021) see that RPA's impact on the jobs and current employees is a challenge. As with any new technology, people might feel threatened by RPA (Lacity & Willcocks, 2016b) and see robots as direct competitors for a job (Asatiani & Penttinen, 2016) or that their positions are weakened by robots (Gotthardt et al., 2020). If not transparently communicated and properly handled, this might have destructive impacts on employee morale (Asatiani & Penttinen, 2016). Siderska (2021) claims that there is no reason to fear that robots would make people obsolete, but it will surely impact jobs and require organizations to rethink employee roles. Strategic initiatives to deploy RPA should consider engaging employees with the technology which is essential for RPA success (Amaka & Nnenna, 2021). Table 2 gathers RPA challenges recognized in current research.

Table 2: Challenges of RPA.

CHALLENGES	SOURCES
Limited task suitability	Asatiani & Penttinen, 2016; Fernandez & Aman, 2021; Rutaganda et al., 2017; Siderska, 2020
Lack of proven track record	Asatiani & Penttinen, 2016; Costa et al., 2022
Compromised data security and privacy	Cooper et al., 2019; Flechsig et al., (2022); Fernandez & Aman, 2018; Gotthardt et al. 2020
Incompatible data	Costa et al., 2022; Gotthardt et al., 2020; Hegde et al., 2017
Impact on current employees	Asatiani & Penttinen, 2016; Fernandez & Aman, 2018; Lacity & Willcocks 2016b

Despite the challenges listed above, research has proven successful RPA implementations and positive post-implementation feedback (Asatiani & Penttinen, 2016; Willcocks et al., 2017). According to Amaka and Nnenna (2021) and Siderska (2021), the overall impact of RPA is seen as positive as its strengths outweigh its weaknesses and thus the technology is regarded more as an opportunity than a threat. The realization of both benefits and possible challenges comes down to the success of RPA implementation (Costa et al., 2022).

4 CONCLUSION

Digitalization and automation of workflow processes, e.g. RPA, are emerging in organizations as a solutions to their constantly growing demands of organizational processes. The utilization of RPA is one of the ways to improve efficiency in the organizations, by reducing human labor in routine business processes, improving the quality of the work, enhancing scalability, increasing productivity, and reducing costs (Kirchmer 2017; Fernandez & Aman 2018). This position paper offers a fairly novel approach to the discussion of impacts of RPA, especially benefits and challenges the literature recognised. Even though there is no universal concept or framework for RPA adoption but a stream of research around this topic has recently emerged (e.g., Costa et al., 2022; Gotthardt et al., 2020; Januszewski et al., 2021; Rutschi & Dibbern, 2020). And with the above created understanding of the benefits and challenges of RPA the aim of our ongoing research is to continue towards a framework of RPA adoption in Sales Support.

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