Impacts, benefits, and implementation of RPA and its effect on outsourced work

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Contents

1. Introduction

This report is discussing what kind of impact does the Robotic Process Automation (RPA) have on outsourced work, and what benefits would the RPA have compared to outsourcing work. The motivation to research the topic came, since there is lots of literature on how the RPA can be used to reduce the costs of the work, let the company to specialize in its work, and develop working environment by removing repetitive tasks. However, there were lack of research on comparing outsourcing and RPA, even though both can be used to rich similar benefits in business. This report is aiming to try to close this gap.

The report starts with introducing the literature of RPA and outsourcing: what are they, how to implement RPA, and what motivated companies to take decision on using either RPA or outsourcing in their business. In the discussion part these motivations and impacts are compared with each other in order to reach conclusion on the question: could RPA be used to bring back outsourced work inhouse.

2. Introduction to RPA

The on-going trend of digitalization forces companies to be agile in development activities in order to be competitive in their industry. Furthermore, competitiveness demands also for efficiency in different operations. In addition, companies are forced to consider outsourcing partners like partners to automate their physical asset handling activities (Minashkina and Happonen, 2018), find ways to digitalize asset management operations (Kortelainen et al., 2019) and reconsider their business elements to fit to modern digital data based economies and platform solutions (Metso et al. 2019). Process automation with RPA is one promising way to automate tasks and thus create cost-efficiency. Furthermore, with RPA workers can be relocated to work with tasks where more value is created for the company. (Ivančić et al., 2019)

Hofmann et al. (2020) define RPA as "preconfigured software instance that uses business rules and predefined activity choreography to complete the autonomous execution of a combination of processes, activities, transactions, and tasks in one or more unrelated software systems to deliver a result or service with human exception management". In general, RPA as a concept is an umbrella covering multiple different tools. These tools are utilized on the computer user interfaces of one or more systems without API (application programming interface) in place, similarly as humans would. (Kirchmer & Franz, 2019; van der Aalst et al., 2018) There so-called "bots", non-invasive software robots work according to certain rules. Also, other developed technologies, such as artificial intelligence (AI) and mining and analyzing of data can be used within RPA, thus enabling the use of it in more complicated activities. (Ivančić et al., 2019)

2.1. Implementation of RPA

Main motivation to use RPA is to replace people by automating activities where human performance does not add value to the process and where cost-efficiency is pursued (Hofmann et al., 2020). These are usually routine activities that are performed repeatedly and according to certain rules and are vulnerable for human errors (Ivančić et al., 2019). Another characteristic of suitability is that multiple different systems need to be accessed to get the task done (Hofmann et al., 2020).

Ivančić et al. (2019) present different vendors who offer comprehensive RPA solutions. Thus, when implementing RPA, the possible lack of internal know-how does not prevent a company from proceeding with the technology. Furthermore, if the complementary technologies such as AI are also adopted, vendor's vast network for these technologies is an asset. From the company point of view, taking RPA into use has an effect on multiple departments, e.g. business and IT, thus requiring cooperation and strategic management (Hofmann et al., 2020). Nevertheless, when taking RPA into use, emphasis should be placed on training and training materials, different customer services such as customer support and maintenance services (Ivančić et al., 2019).

As shown in Figure 1 certain use-cases are better for utilizing of RPA than others. In the figure on the x-axis is the different types of cases, i.e. work tasks that are always performed the same way. Y-axis represents the number of cases, i.e. frequency of the case types. According to van der Aalst et al. (2018), traditional automation should be utilized when the number of cases is high and there is low variability in different cases (automation column in the figure). However, as the number of cases and also types of cases increase, RPA utilization should be considered, as automation can become too expensive due to variability in types. Finally, when number of cases is very low and multiple different types of cases are handled, manual work might be the best approach. Here again, the cost of RPA or automation might become an obstacle as well as challenging set up due to variability of cases. It must be noted, however, that the manual work column can cover up to 80 % of case types, even though number of cases is only 20 %, respectively, and thus contribute to a huge amount of time-consuming manual work.
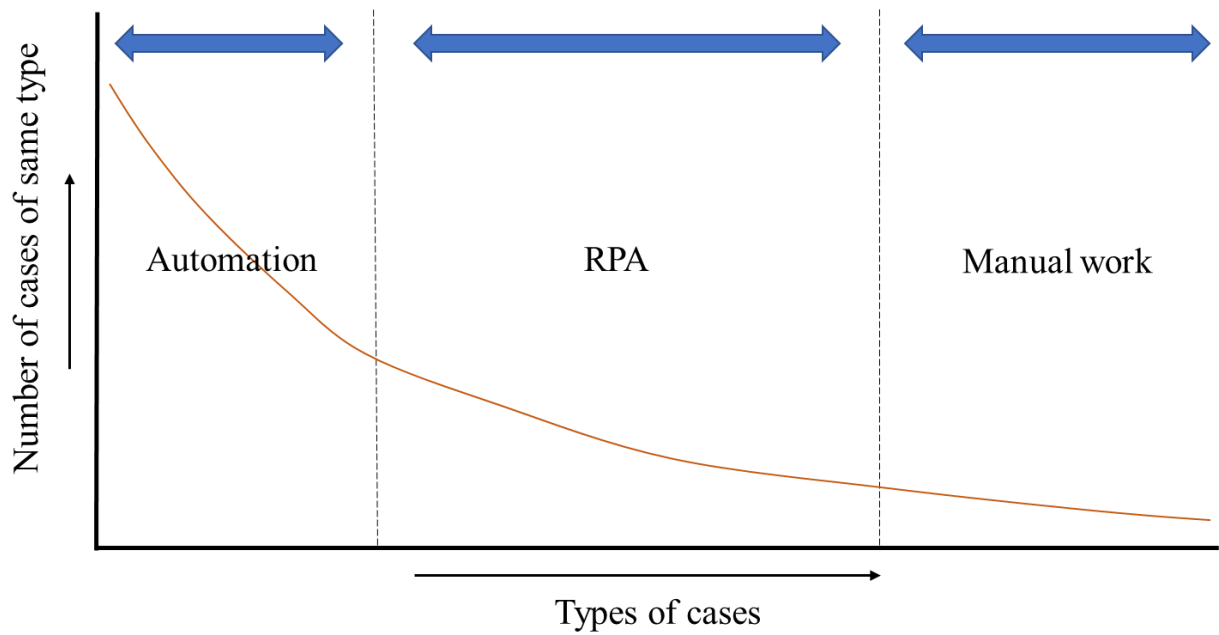
Figure 1 General overview of RPA utilization (modified from van der Aalst et al., 2018).

Examples of cases where RPA is successfully implemented are services such as payroll service and payment receipt, human resource management (HRM) and other administrative back-office processes (Ivančić et al., 2019). Back-office processes can be related to for example reporting, entering data and archiving (Hofmann et al., 2020). To be a bit more precise, tasks that could be performed with RPA are such as entering data, checking of invoices from vendors, insurance applications and loan applications (Kirchmer & Franz, 2019). Examples are further listed below in

Table 1 Implementation examples of RPA (modified from Ivančić et al., 2019)

Industry	Process type
Services	Recruitment
	Financial process automation
	Payroll process
	Payment receipt
	IT management
Telecommunications	Purchasing
	Sales
	Back-office processes
Financial & insurance	Healthcare claims adjudication process
	Administrative back-office processes
Healthcare management	Administrative back-office processes
Sales	Vendor information processing
Oil & Gas	Finance and accounting

When deciding whether to invest in RPA, several aspects should be considered. The organization in questions should have the capabilities either to implement RPA or to at least understand the fundamentals. Even though RPA creates cost-efficiency, the initial implementation requires finances and naturally also time. (Hofmann et al., 2020)

2.2. Benefits and challenges

Besides the aforementioned cost-efficiency, implementation of RPA can bring the organization multiple different benefits. The bots perform their tasks fast without interruptions. Human errors are avoided, and traceability is guaranteed, this way making the process safe and secure. (Hofmann et al., 2020) The RPA processes are scalable, their implementation is relatively easy and cheap and programming skills are not needed (Hofmann et al., 2020, Madakam et al., 2019). From social perspective, RPA can increase work morale, as laborious and repeated technical tasks can be replaced. RPA utilizes non-invasive technology, meaning that legacy systems are not disrupted and thus workload for IT is reduced. (Madakam et al., 2019)

Kirchmer & Franz (2019) presented RPA benefits from banking sector. In a bank the time consumed in onboarding was decreased from 16 days to 9 minutes. Similarly, when RPA was utilized in a marketing company's processes, they reported 80 % reduction in manual effort. A

software development company was able to decrease the number of employees used in invoice process by 67 %.

However, as any other new technological advance, also RPA has its challenges. According to Ivančić et al. (2019), main challenges in implementing RPA is first of all, lack of clear understanding of the technology. This is mostly related to capabilities of the organization as well as having clear goals for the RPA implementation project. As with any automation, also RPA can make mistakes if not set up correctly. In this case, the mistakes are done with no hesitation and fast. (Kirchmer & Franz, 2019) It is also important that the managerial level supports the process and communicates the objectives clearly, sot that the fear of losing jobs is avoided (Ivančić et al., 2019). Hofmann et al. (2020) also point out, that RPA does not create maximal efficiency and cost savings if the predefined processes contain inefficient steps or other errors to start with.

2.1.Impact on work life

Like already mentioned multiple times, one major impact of RPA in work life is the replacement of repetitive and rule-based activities with RPA (Ivančić et al., 2019). This can motivate employees and increase their working morale, as they can focus on more engaging and meaningful tasks, which require creativity, ability to make decisions and also more social interactions (Hofmann et al., 2020, Madakam et al., 2019). Furthermore, employees have reported that after RPA has been implemented, they have more possibilities to develop their own work (changing job description). As processes or parts of them are automatized, entire organization and how work is shared can change. Also, shortage on work force can be also solved with RPA (Fernandez & Aman, 2018)

Not all effects of RPA in work life are positive. According to Fernandez & Aman (2018) and Ivanov et al. (2020) automation can cause fear in the organization. New technologies can seem difficult, employees might face challenges in learning to use them and there can be overall change resistance (Fernandez & Aman, 2018). Addition of new automation technologies can increase the complexity of work, especially in situations in which processes are automated partially, and thus create resistance. Naturally, gender, age, education, and work type seem to affect how people see automation as a threat for their jobs. One aspect behind the fear can be also lack of information and understanding of the field of automation and its meaning.

However, according to two studies conducted in United States and Bulgaria, the fear of unemployment due to automation technologies is not particularly high. (Ivanov et al., 2020)

Furthermore, a common doubt regarding advanced technologies and automation is that people will lose their jobs, which naturally decreases adaptation and employee motivation towards RPA. According to The World Economic Forum (2018), almost 50 % of companies interviewed estimated that utilization of automation will indeed reduce the amount of needed workforce by 2022. Nevertheless, 38 % of respondents expect that workforce can be appointed to new roles and over 25 % estimate that new roles can be created due to effects of automation. Indeed, the phenomena of RPA's effect on employment is still under research and multiple different scenarios have been assessed (Figure 2). For example, Vermeulen et al. (2018) argue that the currently on-going changes in technology, RPA as one, will eventually create new types of jobs. Additionally, there is a constantly increasing number of new products developed and these new products create a need for employees with new skills. Automation is naturally meant to substitute human work, but it can also complement it. (Vermeulen et al. 2018)
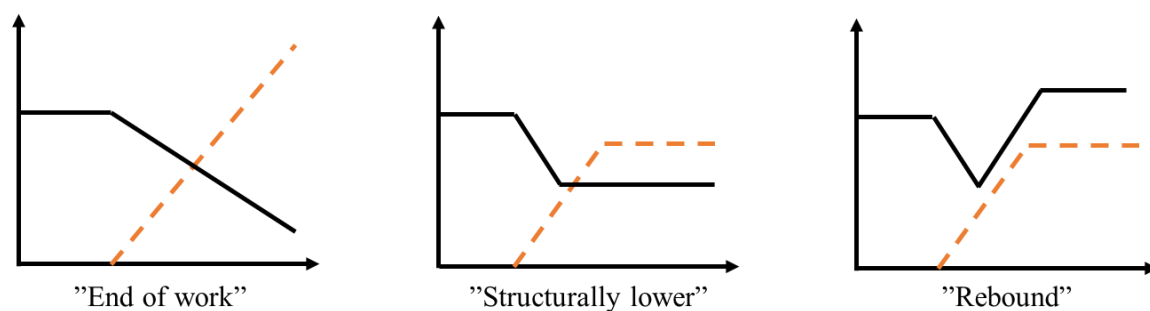

Figure 2   Different scenarios of automation affecting employment. Solid line represents employment, dashed line automation development (modified from: Vermeulen et al. 2018)

In Figure 2 the first scenario depicts a situation where automation takes over all of the jobs, even the new ones mentioned above. Thus, the employment would decrease constantly. Structurally lower is case in which automation causes definite disappearance of certain jobs, but some part of the unemployed can be retrained. Another aspect causing this scenario is if the amount of weekly work hours decreases. Finally, the third case Rebound is a situation in which automation does affect employment at first, but then a rebound phenomenon of employment is seen, due to for example complementary tasks regarding automation and new technology, or reinvestments enabled by costs savings from automation. (Vermeulen et al. 2018)

3. Business outsourcing

McIvor (2005) defines outsourcing as having activities formerly done inhouse, performed by external (third party) supplier. The definition of outsourcing does not exclude actions that could be started inhouse but were chosen to be sourced externally. Outsourcing can be differentiated from off-sourcing, which means outsourcing actions abroad (GAO, 2004), but in this work the differentiation is not relevant.

Brown (2010) claims that over the years, more functions and services have been outsourced to third-party providers, outsourcing offerings have become more sophisticated. Nowadays, even services previously seen as competitive advantages are outsourced. Traditionally the decision of outsourcing business departments is made on the basis of service performance or lowering costs. If the third-party provider is able to provide service with higher or the same performance, but with lower cost, would decision of outsourcing result higher returns than keeping the function as internal department. (Brown, 2010)

One of the most outsourced technology sector has traditionally been logistics (Salmela and Happonen, 2011; Happonen and Siljander 2020; Minashkina and Happonen 2020), where lately the focus has been in the automatization and digitalization skills of the 3rd party logistics operations (Happonen and Minashkina, 2019; Minashkina and Happonen, 2020b). For example, Happonen and Minashkina (2020b) concluded in their research that third party logistics may increase sustainability of logistics, in addition to cost and time saving.

Bengtsson et al. (2009) discussed, in his article, the outsourcing of Knowledge-Intensive business services (KIBS). KIBS can be defined as supporting services that require highs skills and knowledge, advanced technology, and strategical guidance (Miozzo and Grimshaw 2005). Miozzo and Grimshaw (2005) claim that outsourcing of KIBS activities with the help of new information and communication technology, had created a rapidly growing service industry focusing of KIBS sector, with annual growth of 9-10% in UK and Sweden, making it faster growing of all the service sectors.

3.1. Motivation for outsourcing

Brown (2010) says that the benefit of business outsourcing is allowing companies to focus to specialize in their own respective areas of knowledge and activity, as they do not need to make everything in-house. As the outsourcing of more critical services had grown increasingly easier, it had become a strategic practice of companies to reduce costs and to allow growth (Brown, 2010). Also, in ICT and KIBS sector, the major motivations for outsourcing are cost reduction, increased business focus and access to external knowledge (The Outsourcing Institute 2005).

3.2. Effects of outsourcing

In their research, Bengtsson et al. (2009) noticed that there is no correlation between outsourcing manufacturing and the ability to develop new products. They also saw that in outsourcing manufacturing, the cost reductions are made with the expense of raising hidden costs, reduced ability of delivering product in time and being flexible on customer demands. This were the most noticeable when the manufacturing was outsourced but designing were kept in house. Cases with no outsourcing or full outsourcing gave more positive results (Bengtsson et al., 2009). Bengtsson et al. (2009) claims that to become successful in manufacturing, outsourcing should be a complementary strategy, rather than alternative. In addition, Bengtsson et al. (2009) noticed that outsourcing KIBS activities had same impact on business, than outsourcing manufacturing activities.

4. Discussion

When performing the literature review, it became evident that there are a few common motivators behind RPA utilization and outsourcing of activities: cost savings and specialization. With RPA different operations can be made more cost-efficient as repetitive tasks are automated (Hofmann et al., 2020). This gives the employees the opportunity to focus more on the tasks where additional value can be created and thus specialize into more challenging activities. Similarly, traditionally outsourcing activities are considered to lower costs and allow companies to specialize in other activities (Brown, 2010). Thus, if the activities that are outsourced are suitable to be done with RPA (see Figure 1 for grouping of activities), implementation of RPA could indeed help reverse outsourcing of different tasks.

When processes are outsourced, certain level of control is lost. According to Gadre et al. (2017), this can mean that the outsourced processes are harder to enhance, as they are not conducted in-house. On the contrary, processes kept in-house can be modified in a more agile way and the company has a better overview and tighter control of the big picture, as all processes are under the same roof. Gadre et al. (2017) claim that this phenomena of taking back control of own processes (and bringing them back in-house) can be already seen in financial companies where back-office activities have been outsourced. Thus, when companies are making decisions between RPA and outsourcing, besides cost also other things such as future of the processes and relation to other processes should be considered.

The increasing amount of hidden costs while using outsourcing is a phenomenon that might be able to be avoided with keeping the business tasks inhouse by using RPA. If the company is depended on third party providers, may the company become increasingly inflexible for changing situations. With KIBS business this relaying on third party service providers may also cause vulnerability to company's flexibility to answer customer demands, as there might not be inhouse capability to certain tasks fast, but to rely on someone else to do it for them. With using RPA, it would not be necessary to give up all the supporting functions for outsourcing but keep that expertise and capability inhouse. This would allow quicker and more flexible capabilities to react on changing situations, and therefore avoid hidden costs, such as waiting time, lost customers, or sales.

Both RPA and outsourcing can be used partly to same functions. For example, human resources can be outsourced to recruiting or renting company. This way the company is getting the service

of HR as customer. According Ivančić et a.l (2019) HR functions could also be supported by RPA, and this is just one of the supporting functions RPA can do, as it could also be supporting multiple financial and administrative functions. In literature there was no research or proof that RPA could be beneficial in manufacturing processes itself. This also points out that benefits of it to reverse outsourcing of manufacturing process is not researched.

When discussing automation's effect on outsourcing, it must be noted that not only the company conducting the outsourcing will be affected. If and when RPA and other technology enabled by digital transformation will radically change the way work is distributed across the globe, developing countries will be in the losing team. According to Kurt (2019) developing countries will witness a mass unemployment as employment will start to reverse back to industrialized countries. This is mostly due to the lower level of digitalization and related knowledge compared to developed countries. Hence, even though motivated by decreasing costs, not all effects of RPA and automation have on outsourcing can be counted as positive.

An idiom "when your tool is a hammer, everything looks like a nail" should be remembered when discussing RPA and its capabilities (Gadre et al., 2017). According to Gadre et al. (2017) automation should be thought mainly from the perspective of processes, not technology. This means that in the first-place careful consideration should be given to company's processes. When cost-efficiency with outsourced processes is pursued, RPA should not be thought as a silver bullet to every issue, but the processes should be evaluated first – do they have the characteristics of an activity suitable for RPA? Even though automation and RPA especially can solve many issues with repetitive and tedious tasks, it should be utilized only after careful evaluation.

5. Conclusion

Based on the comparison, we can say that the motivations for using both RPA and outsourcing business areas can be similar, especially when talking about intelligent intensive supporting functions. Both give possibility to focus on its specialty, and reduce the number of repetitive tasks on company, organization, and personal level of work. Because of this similarity between them, it is clear that RPA could be one of the tools bring back outsourced work back in-house. It should not however be taken granted that RPA is solution for every situation, and it should be always carefully evaluated the use of RPA in reversing outsourced work.

Compared to outsourcing, we saw that there is possibility that RPA could have benefits compared to outsourcing, like saving in hidden costs of outsourcing while taking control of those processes. However, even though we did not find proof that using RPA comes with higher hidden costs than outsourcing, this area could be researched further in order to gain confirmation on the benefits.

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