

THE USE OF ROBOTIC PROCESS AUTOMATION IN ACCOUNTING



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Abstract

Robotic Process Automation (RPA) is an automation technology that mimics human beings in fulfilling business processes. It is used as a virtual worker. It is found that repetitive tasks with a substantial quantity of work are especially cost effective and efficient to automate. The purpose of this study is to provide theoretical background and a discussion of the role of robotic process automation in accounting. It is important to have thorough account of RPA, which is a technological breakthrough that leads entities to strategical competitiveness in the business world.

1. Introduction

Robotic Process Automation (RPA) is a rule-based software technology which automates routine business processes. Since RPA is software, it can only perform digital tasks. Its programmable part is called robots or bots. RPA is rule-based, which means that the expert's knowledge and skills of related business processes are converted to if/then rules, and then coded into software. In this sense, RPA is designed to mimic human beings. Routine business processes mean repetitive and recognizable patterns of business processes. Therefore, rule-based software, like RPA, is the answer to take care of mundane and bulky, yet time consuming business processes (Plattfaut & Borghoff, 2022).

One does not need data to build Robotic Process Automation (RPA) since human expertise is encoded as a set of conditions. For instance, the developer of machine learning software needs actual data from individual cases. The lack of need for data enables RPA to be programmed easier and faster relative to develop some other systems.

Robotic Process Automation (RPA) is not intelligent software. Unlike artificial intelligence or machine learning systems, RPA cannot learn by its own. If there is a change in which a process is handled, that process has to be programmed again in RPA. However, RPA can interact with intelligent software at the user interface level to become an autonomous system. If one or more intelligent systems interact with RPA, it can handle process changes when new economic and environmental conditions develop.

Various business activities such as production, finance and accounting, sales, acquisitions, supply chain management, customer service and human resources have repetitive tasks. The predicted potential economic impact of RPA is \$6.7 trillion by the year 2025 (Doguc, 2020). Issuing invoices, recording transactions, financial reporting, filling in various types of documents and forms online or offline, data verification or validation or reconciliation, creating and updating databases are examples of areas RPA is used in accounting. The ease of developing and its ability to work in synchronization with other systems, like ERP, web, mainframe, cloud, Citrix or Java applications, make RPA a sought software.

The use of RPA in accounting processes has been rapidly increasing. One third of global companies are using robots in accounting processes (Schatsky, Muraskin & Iyengar, 2016). 500 senior decision makers were asked to answer several questions in a recent survey. 77 percent of those who responded to the survey said that they believed RPA increases productivity through the automation of repetitive tasks, and 56 percent of respondents said that they are planning to use RPA (Doguc, 2020).

2. Implementation of Robotic Process

Automation (RPA)

It is possible to implement Robotic Process Automation (RPA) in the entity following these steps:

1. The redesign of business processes: RPA is achieved by coding the existing business processes. However, there may be business processes which are redundant or obsolete over time. Sometimes, employees start doing business tasks differently than the set policies. Whatever the reason is, the business processes that will be coded need to be checked again. Some processes may need elimination or optimization. The existing and accepted policies are then simplified and redesigned.
2. Choosing the software: It is necessary to choose a platform with automation capacity. The management of information coming from different sources need to be attained.
3. Automate the redesigned business processes: The redesigned business processes are coded.
4. Facilitate the use of the new application: Employees need to be trained to use the new RPA software.

3. Robotic Process Automation (RPA) Models in Accounting

Robotic Process Automation (RPA) is used in accounting frequently. The following are some areas that accounting uses RPA:

1. Recording transactions: There is a systematic approach to recording economic transactions of the entity. This activity involves well defined and predetermined steps (Lacurezeanu, Tiron-Tudor & Bresfelean, 2020). Therefore, it is a good candidate for rule-based technology. Recording transactions is a repetitive task. The relevant accounts are found from a list of limited account names, and debit/credit entries are made to these accounts. As it is seen, this process is repeated when a new entry is recorded. Usually, entities have a high volume of transactions. It is time-consuming and overwhelming for the employees to do

the recording. However, if this task is left to robots, it will finish in a much shorter time with a high degree of accuracy.

2. Financial reporting: Entities which use RPA improve reporting processes by finishing reports faster and more accurately. Moreover, these entities have to define their governance procedures clearly (Meiryani, et al., 2023). In return, this will be helpful for compliance auditing.
3. Payments: Routine payments which are made at the end of a specific time period, like at the end of each week or month for account closures, and payments after every purchase can be coded for RPA. The process of finding unpaid invoices, validating purchases, and paying the amount from the entity's bank account can be automated.
4. Inventory management: An entity should be aware of inventory levels. RPA bots can do all the labor-intensive tasks to inform the critical inventory levels and shorten ordering times to reduce storage expenses (Balamurugan, et al., 2022).
5. Bank reconciliations: RPA can link and analyze related transactions and find discrepancies in the bank account. It is a common practice that RPA is linked to supervised machine learning for reconciliations rather than only using RPA (Bellinga, et al. 2022).
6. Receivables management: Accounts receivable management demand that shipment forms and related customer orders be compared before invoices are issued and payments are made (Balamurugan, et al., 2022). RPA is efficient in updating customer databases. Validating and making payments can easily be coded for RPA.
7. Tax reporting: Filling the tax forms may be considered as a redundant and low-skilled accounting job. It may be considered as a straightforward job, but it is time consuming. One has to manually extract information from the input Excel file to a CVS file (KPMG, 2019). If the entity employs RPA, the bots can collect the required information and write to an output file which has a different format.
8. Monitoring and screening: Robots are used to monitor applications and networks for surveillance reasons (Doğuç, 2021). It is easy for bots to screen the transactions for auditing and compliance purposes.

4. Measuring the Robotic Process Automation (RPA) Success

Generally accepted way to evaluate the success of any investment is to find the return on investment (ROI) ratio. It is a measure of

the investments profitably. It gives a rough estimate on how profitable the Robotic Process Automation (RPA) project to the entity is.

The formula of the ratio can be stated as follows:

$$ROI = \text{net gain} / \text{total investment} = (\text{gain from investment} - \text{cost of investment}) / \text{cost of investment}$$

“Gain from investment” component of ROI is the cost reduction achieved by automating business processes. Usually, it is a monetary estimate of how much the entity gains from automation instead of paying for employees to do the job. RPA projects need a shorter time to be in place than any other automation; therefore, they provide quick returns (Doğuç, 2021).

The qualitative benefits are important as well when considering the gain from RPA. The following is the list of examples one cannot measure in terms of money (Taulli, 2020):

- Accuracy
- Customer Satisfaction
- Agility
- Employee Satisfaction
- Innovation
- Analytics

5. Advantages and Disadvantages of Using Robotic Process Automation (RPA)

The are advantages and disadvantages to using Robotic Process Automation (RPA) software in the entity. These advantages and disadvantages are discussed in the sections below.

5.1. Advantages of using Robotic Process Automation (RPA)

The advantages to use RPA software can be listed as follows:

1. Cost reduction: RPA handles the redundant and bulky processes which were previously accomplished by employees. Entities which employ RPA can use the software whenever necessary and need not pay wages or benefits for staff to do the job. This reduces the cost of existing manual operations by 25% to 40% or more (Lamberton, 2016). It is estimated that this automation would save \$2 trillion in employee costs globally (PwC, 2018).
2. Improve return on investment (ROI): Since there is a cutback of staff, the money, which would be paid to them, will be left within the entity. The money which would otherwise be paid to staff surpasses the cost of implementing RPA. For that reason, the ROI ratio will be higher if the entity employs RPA.

3. Lower error rates: Errors and clerical mistakes are decreased if the entity uses RPA in its operations (KPMG, 2018). Since the tasks are automated and performed by a computer, making a faulty task execution is reduced. When the computer undertakes processes, it will do the same tasks in the same way no matter of its quantity.
4. Coping with high volumes: Robots can undertake high volumes of work and perform the tasks the same way regardless of their difficulty and quantity.
5. Rule-based technology: RPA uses rule-based technology. It means that RPA uses pre-defined rules to perform business processes. It uses logical if-then statements, where certain conditions must be fulfilled before an action can take place. It is not a cumbersome process, and the outcome is always predictable.
6. Simplify business process: Before implementing RPA, entities simplify their business processes by redesigning them. They need this redesign to be able to write the related computer code. However, this simplification helps employees to understand the processes better, write fault-free codes and do their tasks easily.
7. Ease of audit: RPA is a computer technology which leaves behind a digital trail when it is used (Torlone, et al., 2016). The same tasks are performed each time a business process is executed. The design of business processes is the focus of audit. Therefore, it is easier to audit the controls rather than individual transactions.
8. Easy to program: RPA executes rules-based business processes. It is easier to write codes for preset rules than writing codes for intelligent software (KPMG, 2019). Programming of RPA can be learned with a few weeks of training; hence no extensive programming experience is needed.
9. Specialized personnel: Some tasks require specialized and experienced personnel. If the entity has RPA to perform the task, the computer will complete the task as if it is done by a specialized person. This will eliminate the need to find specialized personnel every time the need arises. The entity gains a pre-trained digital workforce with RPA.
10. No need for motivation: RPA does not need motivational factors like bonuses, holidays, etc. to successfully perform the duties like employees.
11. Scalability: A process can be specifically defined in RPA. Therefore, that process can be reused for other entities upon need. If the entity undertakes more customers with the same business process, the

transaction volume rises. Related RPA can handle the increased workload (Balamurugan, et al., 2022).

12. Increased job satisfaction: Since RPA does the work for routine and redundant tasks, employees can focus on tasks which are more complex and cannot be done using RPA.
13. Increase in usage: Beyond automating existing processes, companies are using bots to implement new processes that would otherwise be impractical.
14. Improve service: Finding new customers is more difficult than retaining current ones. Therefore, entities should develop strategies to improve the service given to old customers. A survey in 2016 stated that 52% of companies changed providers in the past year due to poor customer service where 73% of them wanted a service more suited to their needs and 61% preferred that the response time to their queries were faster (Doguc, 2020). RPA decreases the average time to respond to queries and finish business tasks by 76% (Diepeveen, Matcher & Lewkowicz, 2016). Moreover, it is found that automation avoids customer and employee conflicts, and that improves customer satisfaction (Lacurezeanu, Tiron-Tudor & Bresfelean, 2020).

5.2. Disadvantages to use Robotic Process

Automation (RPA)

As seen in the previous section, Robotic Process Automation (RPA) projects have many advantages. However, they are not successfully completed all the time. 30 to 50% of initial RPA projects fail (Lamberton, 2016). Moreover, these projects bear some risks (Bright, Michael & Hui, 2023).

There are some disadvantages of RPA which are listed below:

1. Data needs to be in digital form: RPA is a software where it can only use digital data. If the entity's data is not in the digital form, it can either not employ RPA or the effort is greater.
2. Redefine the business processes: Understanding the existing business processes and redesigning them is a managerial problem. However, some entities treat it as if it is an IT problem and is left to IT employees to solve.
3. Processes should have clear-cut rules: RPA uses rule-based technology. Detailed understanding of the business processes is needed for automation. The knowledge of the process exceptions and how RPA executes them have to be known beforehand (Vincent, et al., 2020). Complex processes, where human judgment plays an important role, cannot be

automated using RPA alone. RPA has to be combined with an intelligent system like artificial systems, robotics or machine learning.

4. Forgetting about IT infrastructure: Since RPA is software, it runs in the computer system of the entity. Therefore, the IT infrastructure of the entity is vital.
5. Replacement of human beings with robots: There is a concern that the use of RPA will lead to the replacement of people. Therefore, the employees may be reluctant to employ RPA for their day-to-day tasks. A survey indicated that lower-level employees did not share the same view as the management that RPA brings work satisfaction (Cooper, et al., 2022). Research indicates that low-skilled workers tend to be replaced by RPA, however, new occupations emerge (Zhang, et al., 2023). The employment demand has shifted towards accountants who have advanced digital skills (Ng, 2023).
6. Inability to adapt to uncertainty: RPA works with predetermined rules. It is not open to changes unless the coding is altered or it is used with an intelligent system.
7. Possible errors: There is a high risk of possible errors and malfunctions if the business processes are not designed according to the existing situations or RPA is not coded well. A survey states that RPA raises control and security concerns among professionals, including uncontrolled or unknown bots, fraudulent bot activities, and changing business processes which leads to bots providing bad data (Eulerich, et al., 2022).
8. Reduces the number of potential customers: Some customers want to interact with people. RPA is not for those who would like to do business with people only.

5. Conclusions

Robotic Process Automation (RPA) is a technological development where business processes are automated. It is a rule-based technology where redundant tasks with high volume transactions are accomplished. The main idea behind RPA is to execute business processes in a timely and accurate manner without using employees. RPA can be considered as a virtual worker.

The technological attributes of RPA make it an indispensable part of accounting models. Recording transactions, financial reporting, payments, inventory management, bank reconciliations, receivables management, tax reporting, monitoring, and screening for audit purposes are accounting tasks that can be easily automated with RPA.

The RPA projects start with redesigning the business processes. After that the software needs to be chosen and the business processes have to be coded. Lastly, employees have to be trained to use the software.

All RPA projects come with a cost of automation. However, the advantages of RPA are out ways its cost. The savings on employee salaries and benefits, which the entity is otherwise paying, is the monetary advantage. The non-monetary advantages are many. Error-free and timely completion of work with increased job satisfaction are a few of these advantages. Like with all automation projects, there is a dark side of RPA. The possibility of errors in coding or replacement of employees with a computer program may render havoc.

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