Robotic Process Automation: Benefits and Advantages

Many companies use monolithic IT and ER systems, which can strongly restrict the flexibility of their operative processes. If structured data is present, Robotic Process Optimization (RPA) may be the solution, as it enables compensation for corresponding deficits in the openness and adaptability in the installed basis system. Research shows that RPA is at least a suitable solution for automating repetitive and standardized processes. Whether or not long-term benefits can result from this approach remains an entirely separate question.

Keywords
ERP, Robotic Process Automation, RPA, process integration, automation, bot optimization, Robotic Desktop Automation, RDA, unattended RPA, attended RPA

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Robotic Process Automation in Lieu of a New ERP System

The Reality Behind the Hype

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Robotic Process Automation (RPA) stands for the software-supported operation of software solutions via their user interface. The primary goal that RPA seeks to achieve is the automated execution of routine tasks that previously required human intervention. However, the potential of RPA to improve processes in the long term is very limited. Automating processes and bridging front-end media disruptions leads to a variety of dependencies and conditions, which are summarized in this article. The path to a sustainable enterprise architecture (and the processes and systems comprised therein) requires open, adaptive systems with modern architecture that are characterized by a high degree of interoperability at various levels.

Robotic Process Automation (RPA) stands for the software-supported operation of software solutions via their user interface [1]. According to Gartner, the technology is one of the fastest growing markets in enterprise software [2]. The primary goal that RPA aims to achieve is the automated execution of tasks that previously required human intervention. RPA software thus imitates the interaction of a human with a software system, e.g. when reading out, changing and re-entering data. The trend can also be described as a bridging technology [3], as RPA is not fully integrated into the existing system landscape, but only uses the top architectural layer (namely the user interface) [4]. Data can be transferred between different software applications or just between different modules or input screens of an application [1]. For selected tasks, RPA can replace humans or – when transferring data between two software systems – the programming interface.

Use and structure of classic RPA software

RPA is typically used for repetitive tasks that are characterized by simple, clearly structured rules and a high level of standardization. The starting point for this is usually processes that offer the advantages of rapid processing and data transmission times. In such an RPA use case, the application is installed on a client. First, the necessary set of rules is created and used to determine which software user actions to automate. A macro recorder, which records user interactions with the programs and creates a template for automation, aids in this determination. The recordings are then turned into configurable rules according to which the software robot should ultimately work. Basic dependencies and conditions can also be modeled here. This configuration is made possible by an editor. The management console is responsible for load distribution and monitoring of the individual robots [1, 3].

RPA software is characterized by its lack of platform dependence. No individual system interfaces are necessary, because access to the systems involved in the process takes place via the respective presentation tier [4]. This also means that the underlying logic of the existing systems remains untouched. RPA software does not create new applications and does not store transaction data.

Basics of RPA

RPA solutions can generally be divided into two operating modes: attended and unattended. With attended RPA, also known as Robotic Desktop Automation, the program runs on a client. A supervised mode allows individuals to trigger bot activities in order to perform, automate, and actively monitor parts of a process. Unattended RPA software, on the other hand, runs on the server and acts autonomously. The processes are processed by the software in a fully autonomous manner. Different systems can also be controlled. In some cases, several robots interact with each other and divide tasks among themselves [5].

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What opportunities and possibilities arise from the use of RPA?

Nowadays, against the current background of competition and cost pressures, the importance of efficient processes in companies is constantly increasing. RPA promises the idea of increasing efficiency by integrating software bots instead of employees to carry out work processes. In this way, manual steps can be automated by processing, preparing or storing structured information from various sources in (e.g. ERP) systems according to specific rules. Three main opportunities arise from the use of RPA:

Efficiency and productivity gains

The use of RPA technologies is useful when the automation of simple processes can demonstrably lead to gains in efficiency and productivity. Operational efficiency is sought in the form of time, cost and personnel savings, reduction in manual tasks and labor effort, and increase in productivity [1, 6].

Increased data quality

By using RPA, common transaction errors such as incorrect data entry, skipped process steps or errors caused by the application of rules are reduced. In addition, the number of human errors can be reduced [7].

Cost-effective and technology-independent alternatives

RPA can be implemented, configured, and maintained more easily and cost-effectively compared to large enterprise systems and other forms of automation [8]. At the same time, it offers users a simple and intuitive interface. Well-known applications and sources, from the mainframe to Excel and from CRM or ERP to web applications, can all be used by the software bots. Implementation is possible without disruption to the underlying IT infrastructure, provided that the underlying forensic software is compatible with the RPA software [7].

The limits of RPA

However, RPA also has its limitations. A major obstacle to successful RPA deployment is currently the mandatory requirement for structured data. AI and other complementary technologies could enable the extension of RPA benefits to unstructured or semi-structured data [6]. In addition, RPA cannot carry out dynamic decision-making processes [1], meaning that possible RPA processes are limited to rule-based processes and should ideally be based on simple business rules. There is only limited automated response to unforeseen process sequences and errors (complex error handling is difficult to implement). When it comes to the advantages of RPA, the low technical barriers and lack of programming knowledge required of users are repeatedly emphasized. However, implementing RPA exclusively on the presentation tier also has certain disadvantages. Since the software only interacts with the programs once they are in a human-readable format, RPA eliminates the need for the multi-tier network communication relied upon by traditional applications. Modules, input forms and applications are only read via the user interface. If the form of presentation is changed even marginally during an application update, errors can arise in the execution of the process. A high error rate can occur, particularly in web-based application systems that are characterized by design and display changes. It is also unclear to what extent the accuracy of the automated processes should be checked and where the responsibility for this lies. A changed arrangement of buttons or a new menu entry on portals such as Amazon is difficult to control. Furthermore, in the context of automation, the surface-based automation approach results in a low data throughput rate when compared to decoupled interfaces. The process steps and inputs always depend on the interface. This severely limits the scalability of possible applications.

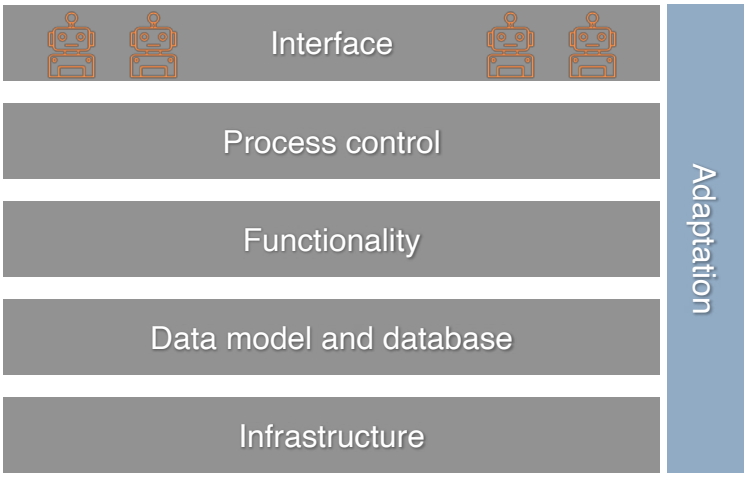

Figure 1: *Abstraction of ERP system architectural levels.*

So which process is right for RPA?

Although the implementation of bots can lead to impressive results, RPA does not meet the requirement of being able to automate highly complex processes end-to-end and can thus only partially contribute to a complete automation of such processes. Companies run the risk of selecting unsuitable processes for bot automation due to unrealistic expectations. Therefore, selecting the right processes can be considered the biggest challenge of RPA automation. The following characteristics can be used as criteria for selecting a suitable RPA process [6]:

- *Strongly rule-based processes*
  RPA requires a prescribed rule for each eventuality, and this rule must be unambiguously clear. The decision logic of the selected process must be logic-based and and almost completely predictable for all cases.
- *Repetitive tasks*
  Adequate transaction volume helps maximize the benefits derived from implementing software bots in an organization. Generally, routine and repetitive tasks constitute an ideal choice for automation.
- *Process maturity*
  Established processes that are stable and understood by all process participants are suitable for RPA.
- *Structured and digital input data*
  All input data must be digital and in a well-structured format.
- *Transaction-oriented tasks*
  RPA is suitable for transactional tasks that are performed by humans and can be replaced by software robots. In particular, transaction errors (e.g. incorrect data) can be reduced, and many transactional activities can be carried out at once.
- *Degree of standardization*
  Processes with a high degree of standardization are best suited for the application of RPA. The more complex a process, the more complex it will be to implement using RPA.
- *Few exceptional cases*
  Processes designed for RPA should not have to deal with exceptional cases. The more special rules are handled by bots, the likelier it is that process automation and optimization efforts are delayed or canceled. In this case, increased manual intervention is also necessary.
- *Process documentation*
  Process descriptions are essential to teach bots specific keystroke and click sequence behaviors. If processes are well documented, bot implementation will be more successful.
- *Number of systems in the process*
  There is great potential for the use of RPA in processes that extend across multiple systems and have grown unnecessarily complex or time-consuming due to media disruptions. Accordingly, the requirements must then be met by all systems involved. The strength of RPA lies in its usefulness as a bridging technology.

What can RPA do in the context of ERP systems?

Companies often use outdated, monolithic ERP systems. Programming interfaces to connect to modern digital applications or switch to a modern, open and service-oriented ERP system is a task that often exceeds the budget of the IT departments. In this case, RPA offers a way out of the dilemma and automates or accelerates processes without interfering with or changing the existing ERP systems.

- *RPA as an integrator*
  If an ERP system does not offer an interface for an existing problem, content can be exchanged with a third-party system via GUI remote control (RPA) [1]. Reasons for a lack of interface could be an outdated technology platform or a lack of development resources.
- *RPA to improve ergonomics*
  A lack of usability due to outdated systems and synchronization with third-party systems can in many cases obstruct productivity. However, people often stick with such systems because the costs and effort involved in changing systems outweigh any expected gains in processing speed. This is where RPA can offer a short-term solution by compensating for the deficits in the installed base [1].
- *RPA as a testing tool*
  New release and version changes in ERP systems are based on a test phase lasting several weeks, in which a copy of the available productive data is used to check whether the new system works correctly for the specified requirements. However, by using RPA, test guides with click sequences can be created, which can then replace special testing software at this point [1].
- *RPA as a bridge between the real and digital world*
  Processes based on (paper) forms can be ideally automated in the ERP system using RPA. Particularly when forms involve structured data, RPA can be used to extract, interpret and assign said data to one or more business processes in the ERP system. In the case of paper documents, they are first scanned and then converted into a machine-readable form via OCR technology. [1]

Conclusion and outlook

As long as rigid and monolithic IT and ERP systems are in operational use at companies, RPA can be used as a solution to compensate for openness and flexibility deficits in the installed base. The user gains short-term flexibility, but the problems of the existing systems are only shifted elsewhere, rather than solved. RPA is suitable for automating repetitive and standardized processes. However, the most important prerequisite here is the availability of well-structured and digitalized data. In many practical applications, however, this structure is missing. The best example of this is emails, which have digital content but are generally unstructured. This means that the combination of RPA with other cognitive components – such as an OCR component – offers significantly greater automation potential than the possible further development of RPA itself into a cognitive solution.

The potential of RPA for long-term process improvement should be seen as severely limited. The automation of processes and bridging front-end media disruptions results in a variety of dependencies and conditions, which have been summarized in this article. The path to a future-proof enterprise architecture (and the processes and systems that comprise it) requires open, adaptable systems with modern architecture, which are characterized by a high level of interoperability between various system levels. This ensures that interaction and coupling with other systems, as well as the automation of processes, are sustainably supported.

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