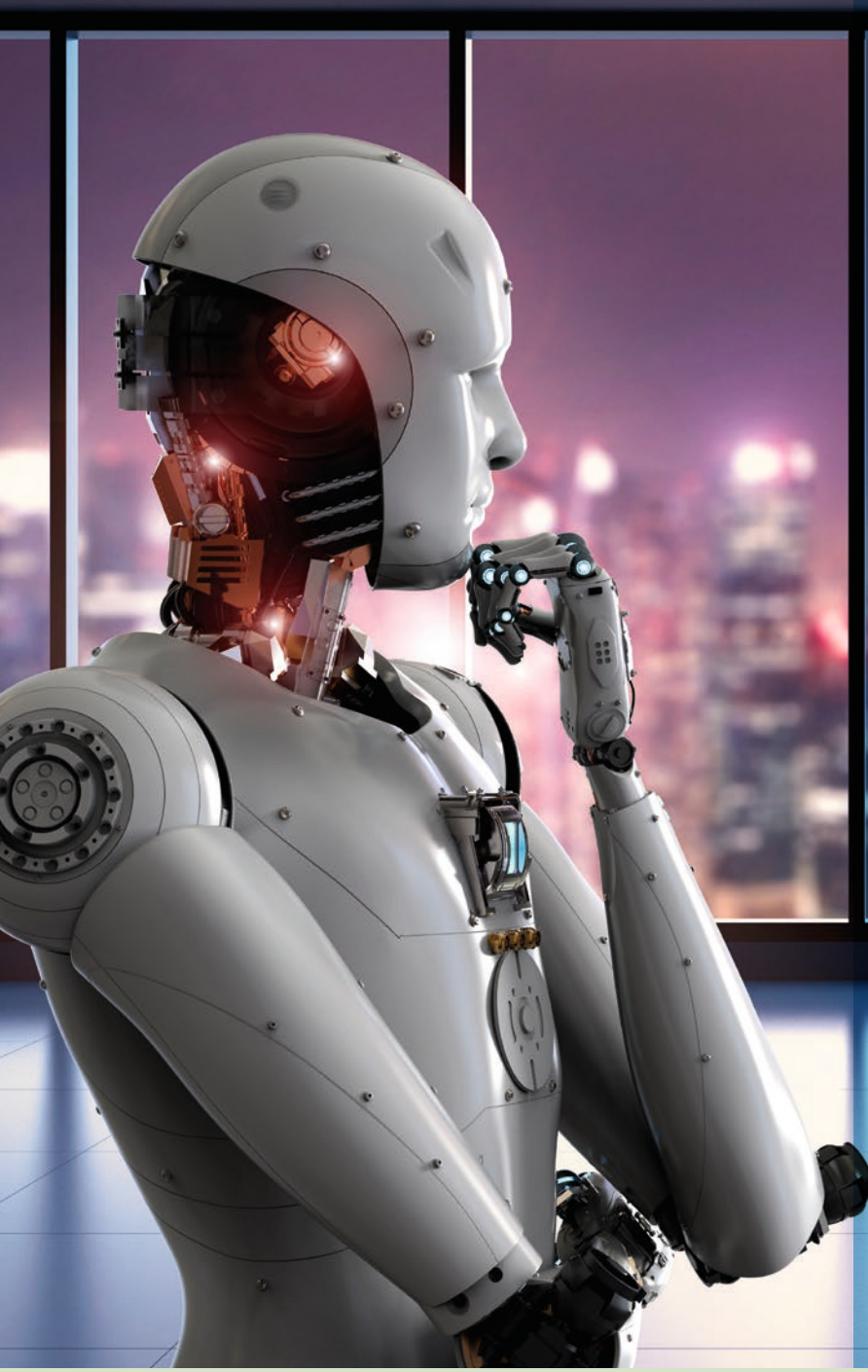

Robotics Process Automation

Address functional and technical challenges during SAP implementation projects with RPA

Enterprise Resource Planning software provides an opportunity to streamline business processes and is considered to be the backbone of the current IT infrastructure for most organizations, however it also brings along several challenges in the implementation process that need to be overcome. There are different ways to address these challenges. This article focuses on how Robotic Process Automation (RPA) software can be incorporated in SAP ERP implementation projects to improve efficiency and quality, as well as provides practical insights based on client's use cases.

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INTRODUCTION

Enterprise Resource Planning (ERP) software, such as SAP ECC or S/4HANA is considered to be the backbone of the current IT infrastructure of most organizations. While ERP systems provide companies several obvious benefits, the implementation of ERP is not without challenges. There are many examples of failed ERP projects. Just recently, Lidl canceled their SAP implementation project after spending € 500 million and seven years on it ([COMP18]). ERP is a major investment, financially and in time and effort. Expectations of the new system are high and, unfortunately, ERP implementation projects do not always deliver the expected benefits.

In this article we will look at a few common challenges many organizations face during ERP implementation projects, and provide a perspective on how to apply concepts and tools of Robotic Process Automation (RPA) to enhance the SAP implementation process.

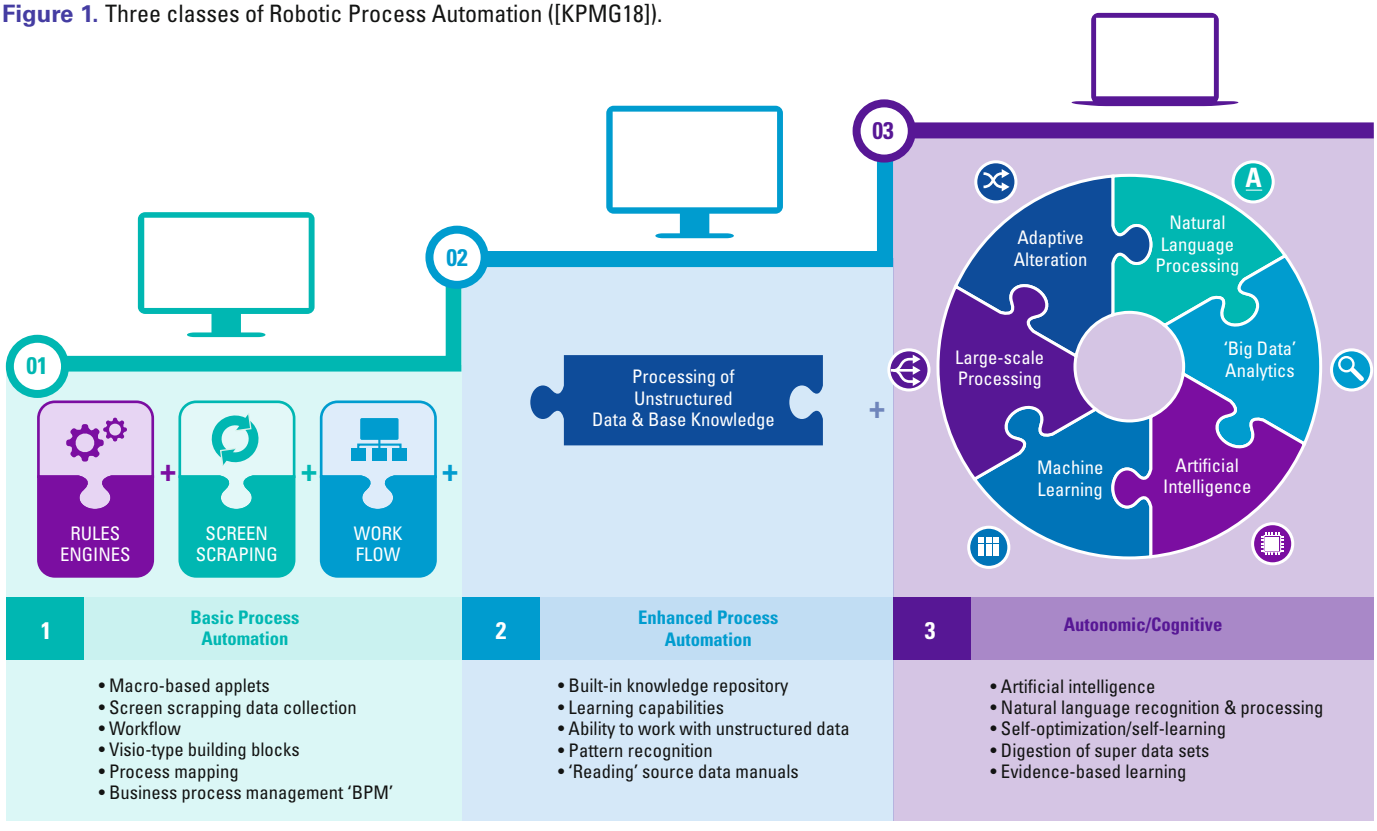
WHAT IS RPA?

To understand how SAP implementation or improvement projects can be enhanced with RPA, it is important to gain an understanding of what exactly RPA is and how it can be used.

In short: RPA is the use of technology and bots – software robots that perform pre-programmed tasks – to automate work traditionally done by humans. RPA describes the continuum of technologies that organizations can use to automate both business processes and operations, to improve quality and efficiency. At one end, it includes the basic automation to automate routine business process activities and operations, such as managing vendor data. At the other end, it covers the application of sophisticated technologies, involving cognitive machine processing and elements of artificial intelligence. RPA can be categorized within one of the three classes: basic, enhanced and cognitive automation. Each class varies based on complexity of tasks to be automated, which may span across basic user interface-automation to advanced decision-making. Basic Process Automation is associated with doing, execution of processes, whereas Enhanced Process Automation (Machine Learning) and Cognitive Automation (Artificial Intelligence) are concerned with learning and thinking respectively.

If we apply the three classes of automation to the process of invoice processing as an example, Basic Process Automation allows to download electronic invoices received by mail into a predefined folder (based on the subject of the e-mail or the mailbox) and create postings in the accounting module. Enhanced Process Automation is

Figure 1. Three classes of Robotic Process Automation ([KPMG18]).



required to read the invoices and extract the relevant information to determine which postings to create. Cognitive Process Automation enables self-learning to automatically enhance processing of unstructured data to support different invoice formats used by suppliers.

While some dimensions of RPA are far from new, advancements in cognitive capabilities and related technologies are expanding the scope of where organizations can apply RPA.

APPLYING RPA TO ADDRESS CHALLENGES IN ERP IMPLEMENTATION PROJECTS

In this section, we will elaborate on some of the common challenges of ERP implementations and how RPA solutions can subsequently help to address these challenges.

Based on our experience in SAP implementation projects, we identified four challenges where RPA can be applied during the implementation project:

1. functionality gaps;
2. complex interfaces;
3. gaps in user experience (unrealistic expectations);
4. insufficient resources and time for testing.

Challenge number 1: functionality gaps

ERP vendors offer a set of best practices for particular industries and processes as a part of the standard package. However, in almost all ERP system implementation project there will be a gap between the business requirements and what is offered by the standard ERP solution. Depending on the type of functional gap and the strategy used to close these gaps, this will result in process redesign or customizing the SAP system. We therefore distinguish four types of functional gaps:

1. SAP can support the business processes, but business requirements are not defined properly (not specific enough) or managed properly;
2. SAP does not support the business process requirement. In most cases these are company-specific or industry-specific processes that have not been included in industry solutions (yet). Developments to close these gaps are usually complex and expensive;
3. SAP supports the business process requirement, but the implementing organization does it in a different way for a specific business reason (competitive advantage). These are differentiating processes where organizations want to do a part of the process differently from standard SAP;
4. SAP alone does not support the business process requirement and needs additional applications to satisfy the requirement.

Organizations are often tempted to make small changes in ERP software to satisfy the business users. However, applying many small changes can lead to a hugely customized system over time. Customizing ERP can lead to issues making it more challenging to maintain. Customizing also increases the cost of upgrades as the customizations must be re-done. Sticking as close to the standard as possible is important to prevent issues and high cost. Only develop additional functions or altered capabilities when necessary (legal requirement or competitive advantage) and cost-justifiable. RPA can be used to minimize the number of required customizations and close gaps in ERP (without impacting user acceptance) by using screen scraping or OCR technologies. In the next section we will describe a use case in which we applied RPA to address this challenge.

Context/client challenge
A large consulting firm replaced multiple non-integrated HR solutions with an end-to-end human capital management system on the SAP SuccessFactors platform to support their HR processes. The goal of the SAP SuccessFactors implementation was better integration with SAP ERP and to enable employees to maintain their HR-related data themselves, manage their leave records and have online access to payment information. This freed HR employees from non-value adding activities like changing staff addresses, answering employee queries about holiday quota, etc. Although SAP SuccessFactors is packed with many features, it still failed to meet some important business requirements. For example, SuccessFactors did not offer automated contract creation for new joiners, the process for creating contracts was inefficient and required "swivel chair" access to multiple systems.

Approach
KPMG assisted the client with the selection and implementation of an RPA tool (BluePrism) to automate various HR back-office processes and free up HR employees for higher-value work. In this specific use case KPMG used RPA to enable the client to automatically create contracts for new joiners. The robot was designed for this process, while KPMG also has a large repository of preconfigured SAP robots to optimize standard SAP processes. The following applications were used in the HR process: SAP SuccesFactors, a signing application (DocuSign), an archiving application, Microsoft Excel and Word. The robot automated the creation of the contract, the

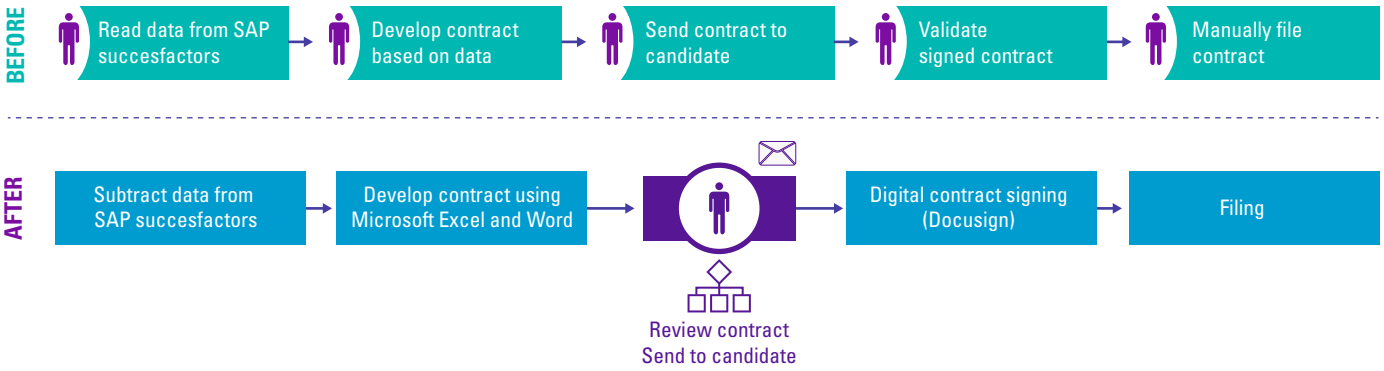


Figure 2. Simplified overview of the before and after HR contract process.

signing workflow and the archiving of the signed contract and other relevant documents provided by the applicant. Below the before and after process flow is depicted graphically.

First, the robot subtracts the data, including personal information and employee benefits information, from SAP SuccesFactors. Based on this data, the robot creates a contract that meets all HR and regulatory requirements using Microsoft Excel and Word. After approval of the contract by an HR employee, the robot starts DocuSign to digitize the contract signing process. In this process step, the created contract is sent automatically to the new joiner. After the applicant signs the contract, the robot collects the signed contract and other relevant documentation that was uploaded by the new joiner and archives these files using the archiving application.

The only manual intervention required in the new contract creation process is a review of the contract that was created by the robot before it is sent to the applicant.

Benefits

Implementing RPA to address the functionality gap enabled the client to create contracts directly out of SAP SuccessFactors. This dramatically reduced the time required to create, review and archive contracts. Also, a reduction of human errors in contracts was mentioned as a result by the client. Using RPA to close the functionality gap instead of repetitive manual activities by HR employees freed up valuable time of HR staff to work on more value-adding activities, like recruitment and interviews with candidates.

Challenge number 2: complex interfaces

In most organizations, legacy systems still perform critical functions, and there is a need to integrate the ERP solution with a (large) number of other applications in the existing application landscape. Efficient integration and seamless data exchange are critical to realize the full potential of ERP in today's digital business landscape. SAP S/4HANA offers integration technology options based on the deployment selection: SAP Process Orchestration, SAP HANA Cloud Integration, and Web Services.

Integration can be complex, and at the beginning of the ERP implementation project it is a major challenge to estimate how complex it is to design and build the required interface developments, and even their technical feasibility. This can result in a time and cost overrun, impacting the overall project timeline and budget. Two popular options come to mind when assessing how to make integration of ERP with legacy applications less complicated and less expensive: APIs and Web Services. Availability of an API, native integration, or legacy application source code is essential for integration methods, such as APIs or Web Service calls. When these are not available, or integration via API or via Web Services is too complex, RPA can help by integrating applications via the user interface.

SAP S/4HANA offers integration technology options based on the deployment selection

Context/client challenge
A large producer of flavors and fragrances and cosmetic actives was struggling with a fragmented IT landscape. During the implementation of SAP as a new ERP solution, the large number of legacy applications that had to be integrated with the new SAP solution became clear. The legacy applications support many processes and contain critical information, making them essential to business operations. The client looked at replacing or rewriting legacy applications to integrate with the new SAP solution, but concluded that this was too time-intensive, disruptive and costly.

Approach
KPMG helped the client conduct a detailed assessment to identify which legacy applications were candidates for integration, by using existing enterprise systems and basic automation technologies. Together with the IT department of the client we prioritized the opportunities based on value proposition, complexity of the solution and implementation effort. For the selected legacy applications BluePrism was used to develop the RPA-driven interfaces due to its functionality and ease-of-use.

The example below explains how RPA was used for the automation of the integration of financial data. We developed robots to fully automate (no manual interventions required) the exchange of data for Accounts Payable, Accounts Receivable and GL-account postings from legacy systems to SAP, to reduce manual labor, errors and rework. Below, the before and after process flow is depicted graphically.

Benefits
The implementation of RPA to address complex interfaces helped the client speed up the development and deployment of interfaces at acceptable cost. A simple RPA script that Extracts, Transforms and Loads (ETL) data from one system into the other can be setup in one day. RPA allowed us to bring applications and processes together without significant IT investment. Another advantage of RPA is that it is more flexible; different data validation and exception rules were designed and build quickly to check the extracted data on different quality criteria. Furthermore, employees did not have to be bothered with manually posting the documents themselves. Therefore, they could focus on other, more value-adding activities.

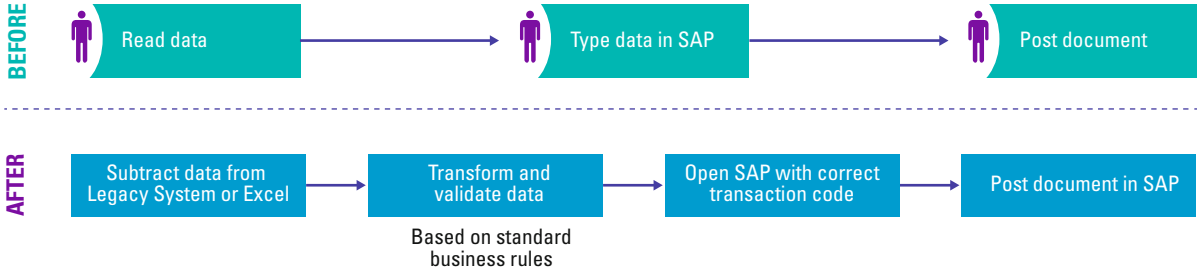


Figure 3. Using RPA as interface.

RPA allows us to bring applications and processes together without significant IT investment

Challenge number 3: gaps in user experience / unrealistic expectations

Unfortunately, ERP does not always provide an optimal user experience. A lot of manual work is still required in executing end-to-end processes in standard ERP, and many legacy applications and external services are not (fully) integrated. For example: employees have to switch from entering a purchase order to an external credit rating application to check vendor credit ratings. RPA can be used to automate workflows, interface with (external) applications, create reports and execute business process steps based on business rules. Software

robots are also very useful for management of master data, such as validating and onboarding business partners (e.g. customers and suppliers) quickly and accurately.

Additionally, many organizations expect ERP will solve every problem the business faces today. This makes the scoping of the project difficult and puts a lot of pressure on the implementation team delivering the project. While it is important to ensure that ERP provides business benefits to the organization, expectations should be realistic and achievable. By incorporating RPA in the implementation approach, we can stretch what is realistic and achievable.

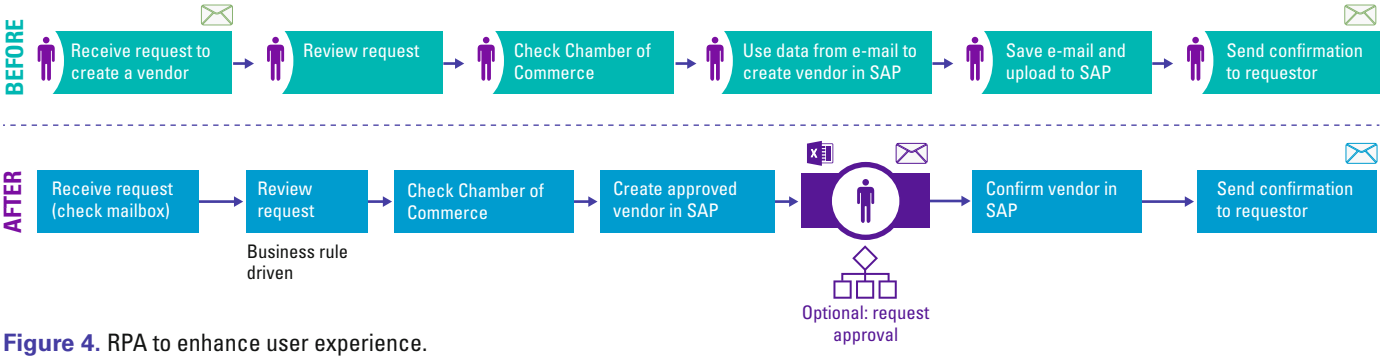


Figure 4. RPA to enhance user experience.

Context/Client challenge
A client approached us because employees were not happy with the recently implemented SAP system. Processes still required extensive manual execution of simple repetitive tasks and processes, resulting in inefficient use of time and labor, and a high probability of errors and rework. This reduced employee morale to work with the new system. The client was interested in implementing RPA solutions across its organization to eliminate mundane repetitive tasks, improve employee morale and improve speed and quality of business processes, without heavily customizing the end-to-end processes in the SAP system.

Approach
KPMG helped the client identify candidate processes for RPA Proof of Concepts (POC), and configured the POC processes to demonstrate the value and benefits of RPA to key business and IT stakeholders. During the POC phase, KPMG delivered several Proof of Concepts to demonstrate the ease of configuration, potential reduction in errors, rework and processing time. We were able to leverage many pre-configured SAP bots that were developed by KPMG. Depending on the degree of customization of the SAP system, it is possible to quickly demonstrate and deploy pre-configured SAP robots in a productive environment. A business case was created for each process to support the decision process.

In this example a pre-configured SAP robot was used for the automation of managing vendor data in S4/HANA to validate and onboard suppliers quickly and accurately (of course the same can be done for customers or any other business partner). Below the before and after process flow is depicted graphically.

The requester fills out an e-mail: a request to create a vendor (or other type of business partner). The robot monitors the mailbox and processes the request by reviewing the request (e.g. correct format, business partner number, etc.), and performs a validation check with an external party, the Chamber of Commerce, to ensure the vendor exists and the data is correct. When the robot has assessed the vendor is correct, it will open SAP and create the vendor by invoking the SAP transaction code using the SAP user interface. It is optional to send an email to the approver of vendor master data to approve the vendor(s) created by the robot. After approval, the robot will confirm the vendor in SAP and notify the requester that the vendor has been created.

Benefits
Automated execution of business process steps based on business rules resulted in improvements in overall employee experience and a reduction in cycle time and reduction in quality issues and rework associated with manual data entry. We were able to apply RPA in nearly all processes in the organization. Examples include Procure-to-Pay, Order-to-Cash, Record-to-Record and HR, but also organization-specific processes that are repetitive and rule-based. End-to-end processes do not have to be limited to SAP, when a process spans multiple systems, the robots can be configured to retrieve and enter data in all of these systems and continue the process.

Challenge number 4: insufficient resources and time for testing

Whether ERP software is standard or heavily customized, thorough testing is key for any successful ERP implementation. Testing can take up to 30 or 40 percent of the time during the Realize phase. If schedules are tight and there are budget overruns early in the implementation project, there is a tendency to cut the number and depth of testing. Cutting corners during testing is a bad idea; interfaces and software modifications are the most difficult custom programs to develop. If not carefully tested, these programs can turn out to be the Achilles heel of the project. Practical uses of RPA to support testing are ([Quick16]):

- *Test Data Creation*: with RPA, you can have a software robot that can extract, scrub and load the test data needed for each test cycle;
- *Regression Testing*: the most commonly automated testing are regression-testing scripts that are run according to a certain frequency, to ensure that new changes to an application have not impacted the software's ability to function as it did before the changes we introduced. Traditional Test Automation tools continue to be best suited to supporting this area, as several of the RPA tools on the market do not support this area;
- *Performance and Load Testing*: this is an area that can be difficult to complete manually, as software robots can more easily generate the load necessary to test the limits of the software.

Because robots can use the same user interface as business users, test cases can easily be converted from existing manual to automated tests cases.

HOW TO EMBED RPA IN SAP IMPLEMENTATION PROJECTS?

RPA can help bridge functional and technological gaps on challenges concerning e.g. functionality, complex interfacing or user experience. In order to realize this, it is essential that RPA is fully embedded in each of the phases of the SAP implementation journey. The following section looks at the fives phases from our K-Activate methodology and highlights the RPA related activities.

K-Activate is KPMG's proprietary implementation method for business transformations enabled by S/4HANA technology. The method is based on KPMG best practices, experience and robust project management and SAP delivery methods. The method consists of prescribed delivery work streams, tasks and deliverables. K-Activate is packaged in a practical deployment toolkit, which accelerates and formalizes project delivery as of day one. K-Activate consists of the following phases.

Prepare
In the Prepare phase, the SAP implementation project is initiated and planned, including quality and risk plans. The system environment and RPA tooling is set up based on the RPA strategy defined before the start of the preparation phase, including best practices for ready-to-run processes. Furthermore, the project teams are further educated on the RPA tooling to create common awareness on the purpose and possibilities of RPA as part of the implementation.

Explore
The customer team explores SAP solution capabilities, while the system integrator researches the customer's business. RPA demo sessions are executed for the customer team to explore the possibilities RPA provides.

Client challenge/context
A client was implementing SAP and several non-SAP applications at the same time to replace numerous legacy applications. This requires end-to-end integration testing to ensure all SAP modules and external application work together as intended. The SAP implementation project was falling behind on schedule, and the client was not able to extend the deadline. KPMG was asked to help speed up the integration testing to stay on schedule.

Approach
KPMG used RPA to automate some of the integration testing. We used RPA to combine individual test scenarios into end-to-end automated test scenarios, and then let robots execute the entire test set. We also stressed the importance of a combination of automated and manual testing to achieve the best results. Manual testing is required for testing and reproducing specific bugs and very complicated use cases (that take too long to configure in a bot). Also, user experience should be taken into account, a robot cannot assess user experience, and therefore a certain degree of manual testing is required.

Benefits
The client was able to speed up the integration test execution significantly, without having to add additional business resources to the project. Robots can work 24/7, which makes it possible to execute more tests in less time. More important, the use of RPA resulted in more reliable tests, because more scenarios could be covered with a larger volume of test data. It also improved the motivation of testers, because they could focus on more challenging test work.

Figure 5. K-Activate project phases.

Together, the customer team and system integrator use fit/gap workshops to identify configuration and extensions that best meet customer requirements, and identify areas where RPA can further accelerate their processes or complement the solution.

Realize
The team configures and extends the system and RPA tooling, based on the prioritized requirements captured in the Explore phase. Configuration and build are done in short iterative cycles, ensuring regular validation by the business. Structured testing and data migration activities ensure quality. Besides the configuration and testing of RPA tooling, it can be used for test data creation, regression testing, and performance and load testing.

Deploy
Final preparation before cutover to production ensures that the system, users and data are ready for transition to productive use. The deployment of the RPA tooling is part of this transition.

Stabilize
After go-live, the business operations and IT solution are closely monitored and stabilized where necessary. The project is closed after handing off operations to the IT operations partners.

By ensuring that RPA is embedded in each phase of the implementation, it will help overcome several key challenges of ERP implementations.

CONCLUSION

By incorporating RPA in the SAP ERP implementation approach, we have an opportunity to close gaps between business requirements and standard SAP without the need for custom developments.

RPA technology provides a new effective way to address these gaps in ERP implementation projects, to enhance efficiency while producing higher quality data. RPA can reduce the level of customizations in SAP landscape, and it simplifies the process of data exchange between systems without significant IT investments.

The case studies show the value of combining RPA and SAP during ERP implementations or during business as usual, as it can help improve business processes and eliminate manual activities, speed up the development and deployment of interfaces or to drive testing phase.

KPMG Advisory has a team of experienced people, who can assist you in assessing RPA tools, identifying RPA opportunities, implementing RPA solutions and helping your organization in applying RPA.

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