

# “The Impact and Possibilities of Robotic Process Automation for Business Processes”

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# Introduction

The purpose of this paper is to explore robotic process automation – its evolution, applications and future outlook – to demonstrate why more companies should invest in the technology. With the growth of digital transformation movements and information technologies in general, businesses need a way to maintain or regain a competitive advantage; robotic process automation is one way businesses can reach that goal.

## What is RPA?

### Definition

Robotic process automation (RPA) is "the application of technology that allows employees in a company to configure computer software, or a 'robot', to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems" (IRPAAI). This technology offers cost benefits, new team roles and a multitude of innovations to improve business processes.

Digital transformation is a change in business “activities, processes, competencies and models to fully leverage the changes and opportunities of a mix of digital technologies and their accelerating impact” (i-SCOOP). Because robotic process automation affects businesses processes it falls under the umbrella of digital transformation. Digital transformation can be compared to business process management, or more specifically, business process optimization. Business process outsourcing is moving from more cost-saving and outsourcing to a more “cost plus optimization plus innovation plus value proposition” (i-SCOOP).

The major premise of robotic process automation is that it creates the ability to map and assign a software robot to manage the execution of any definable, rules-based business process; instead of taking over jobs, it simply takes over tasks. “Robotic process automation technology is not a part of a company’s information technology infrastructure, but rather sits on top of it” (Disys). This technology can be implemented rapidly, efficiently and without making major changes to existing infrastructure.

## History

The term robotic process automation can be traced to the early 2000s. However, RPA relies on older technologies, elevating them to a higher level and using their capabilities to provide more benefit to business users. These technologies include screen scraping, workflow automation tools and artificial intelligence.

### Pre-RPA Technologies

Screen scraping was earlier computers’ ability “to scan large sets of static information or other visual representations of data to pull key terms, integers, or other important analytics” (Ostdick).

The term workflow automation is older, dating back to the 1920s and the industrial age. These tools “replace manual and paper-based processes by integrating tools, automating hand-offs and replacing other repetitive tasks” (Nintex). By focusing on the work, instead of the processes that support that work, employees are more agile and spend less time on repetitive tasks.

Artificial intelligence (AI) was officially coined at a conference at Dartmouth College in 1956. AI “refers to the capability of computer systems to perform tasks that normally require

human intervention and intelligence” (Ostdick). The use of AI has become more practical with the advent of big data, processing power and cloud solutions.

On their own these technologies are impactful, but combined and coordinated they offer even greater possibilities – cost reduction, efficiency and more.

### Evolution

What started as employees manually performing repetitive tasks can now be handed off to a robot, freeing the employee to do other work. As demonstrated in Figure 1, business processes have evolved from making labor more efficient to attempting to eliminate labor. However, robotic process automation is not intended to remove jobs, but instead to take over mundane tasks.

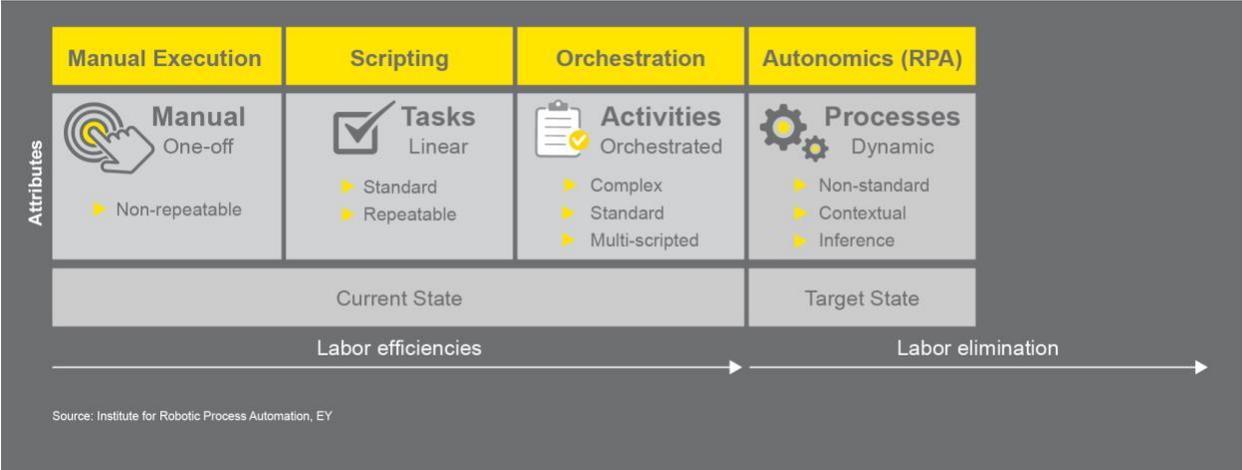


Figure 1

Old manual processes are time-consuming and have a more clerical long process, and consequently scaling requires a large number of human resources. Assisted macro automation is the next step from manual. Macros are short segments of code that perform a single task. The development required for assisted macro automation is laborious, does not offer scheduling and has no centralized management. Macros are non-scalable as they are built for a

single, specific process. Multiple macros cannot run at the same time and there are compatibility issues with legacy systems. Robotic process automation has evolved into more of a virtual workforce than a virtual assistant; it is also a more strategic solution than a tactical process.

In comparison to manual processes and macro assisted processes, robotic process automation offers many more features, as demonstrated in Figure 2. End-to-end process automation means completing all the tasks that must be accomplished in order to achieve the process goal. RPA is also more scalable and flexible – with the ability to scale up or down almost instantly. Hundreds of RPA bots can run at the same time, handling a multitude of different processes; these bots can also be handled by centralized management and scheduled to run at optimal times. Overall, RPA offers several clear benefits over manual and even macro assisted automation.

<b>ROBOTIC PROCESS AUTOMATION</b>
VIRTUAL WORKFORCE
END-TO-END PROCESS AUTOMATION
SCALABLE & FLEXIBLE VIRTUAL WORKERS
MULTIPLE BOTS WORKING SIMULTANEOUSLY
FAST AND EFFICIENT DEVELOPMENT & DEPLOYMENT
COMPATIBILITY WITH UNIVERSAL SOFTWARE SYSTEMS
TASK SCHEDULING
CENTRALIZED ROBOT MANAGEMENT & TRACKING
CAN BE DEPLOYED IN SERVER, CLOUD/SAAS

Figure 2

### Differences Between Automations

The word automation can mean many different things depending on the modifier – robotic automation, business process automation and attended or unattended robotic process automation.

## Robotic Automation vs. Robotic Process Automation

There is a major difference between robotic automation and robotic process automation – software versus physical. Robotic automation can also be referred to as industrial automation which is about controlling physical processes. RPA is utilizing software to carry out human tasks done with computer software (Owen-Hill).

## Business Process Automation vs. Robotic Process Automation

In robotic process automation versus business process automation (BPA) the difference is more understated. The implementation of business process automation is much more involved and dramatic than the implementation of RPA. Business process automation involves analyzing all processes within the business and integrating them into automation software. “BPA is a bit like ripping out [the] entire human-operated production line and replacing it with a fully autonomous factory. RPA is like adding a collaborative robot to one workstation within the production line” (Owen-Hill).

Figure 3 demonstrates the difference in business disruption levels between altering business processes and implementing robotic process automation; effecting changes using RPA is much simpler than enacting changes through business process automation and management. Not only is RPA faster, but the results of the execution are also easier to forecast. Until RPA, more traditional solutions like enterprise

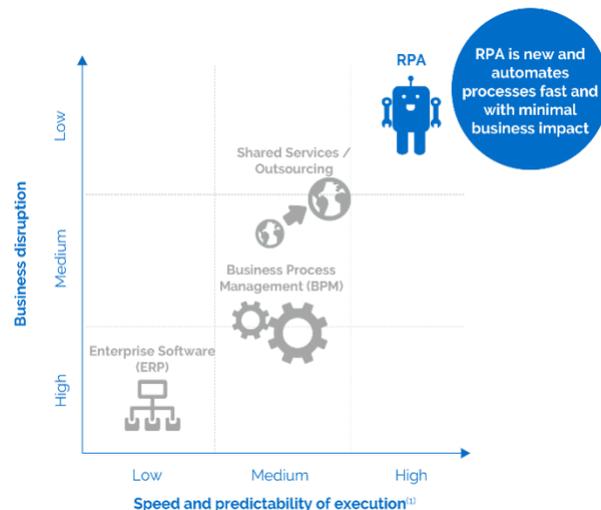


Figure 3

software, business process management and shared services were a company's way of increasing efficiency and growth; however, RPA offers a quicker and more predictable way to achieve those goals.

### Attended Automation vs. Unattended Automation

Within robotic process automation, there is attended versus unattended. As seen in Figure 4, the difference is clear – humans working with automation or automation working by itself with no human interaction.

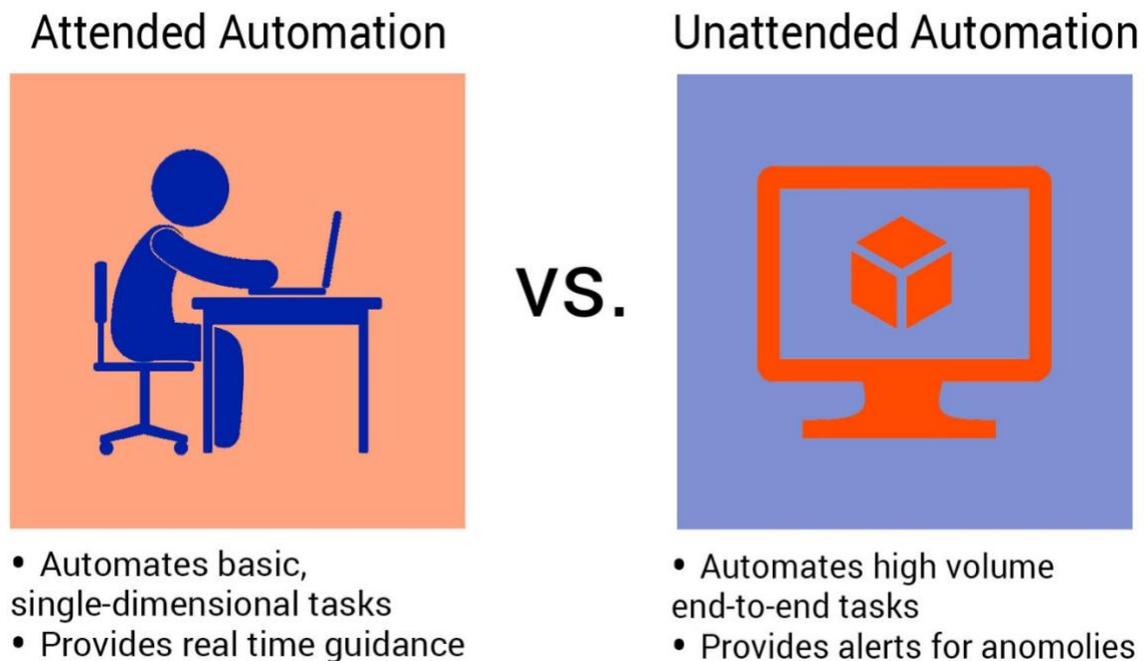


Figure 4

Attended automation relies more on a cooperation between human employees and virtual, robotic employees; essentially attended robots are more like facilitators. They are designed to assist the human aspect of the workforce by ensuring tasks are executed without errors while meeting compliance standards. They are “triggered by specific events, actions, or commands an employee engages within a specific workflow” (Ostdick). Access and automation

features are more limited with attended automation and must often be more agile and user-friendly so employees can move from platform to platform. An example of this is a call center. Employees often navigate through several different screens, entering and retrieving data, all while speaking with a customer. Attended automation streamlines this process, allowing the employee to focus more on the customer than on recalling data.

Alternatively, the basis of unattended automation is no human intervention or as little human intervention as possible. Actions are self-triggered, and work is completed continuously, allowing robots to run as much or as little as needed. Unattended robots can also be accessed remotely; administrators can “view, analyze, and deploy scheduling, reporting, auditing, monitoring, and modification functions in real-time within a centralized hub” (Ostdick). This remote interface allows a wide range of employees access, unlike the limited accessibility of attended automation. An example of unattended automation is transferring data from one form to another. Instead of having multiple employees sifting through multiple forms, a robot can be programmed to scrape the repetitive data from the old form and transfer it to the new form automatically and with zero human interaction past implementation.

Businesses have a choice of what software works best for them; this customization demonstrates why RPA software would work for almost any company.

## Applications

“Any company that uses labor on a large scale for general knowledge process work, where people are performing high-volume, rules driven, highly transactional process functions, will boost their capabilities and save money and time with robotic process automation software” (Dhar). There are many applications for RPA software – ranging from business

processes, remote infrastructure, workflow processes and IT support processes. Figure 5 lists just a few possibilities for implementing robotic process automation.

In their white paper on RPA, Thoughtonomy delves into six real-world use studies where RPA delivered proven value - Customer Service & Support Desk, IT & Infrastructure Support, Data Migration & Management, Connecting Process Islands, Digital & Online Initiatives and Back Office Administration (Thoughtonomy). To expand on an earlier example about a call center, a case

study for a leading European IT Managed Service provider demonstrated how robotic process automation ensures seamless task flow during business and nonbusiness hours, how it resolves its own problems and how it delivers relevant data in real time. Customer experience is an important part of a business and is the main goal of a good service desk or call center. The RPA solution Thoughtonomy delivered was able to complete tasks that once took six minutes in less than 50 seconds. The required number of support technicians was also reduced, allowing them to be redeployed elsewhere to more value-added tasks. Figure 6 displays the quick development and business impact – time and cost savings.

1. Website scraping
2. Customer Order Processing
3. Incoming Customer email query processing
4. Transferring data from one system to another
5. Call center operations
6. Payroll processing
7. Forms processing
8. Client profile updates
9. Generating renewal premiums
10. Claims processing
11. Underwriting processes
12. Policy administration and servicing
13. Requests for overdraft protection
14. Exception processing
15. Statement reconciliation
16. Credit card applications
17. Dispute resolution
18. Patient registration
19. Provider credential verification
20. Member eligibility and billing
21. W4 management
22. Benefits administration
23. Onboarding
24. System access and setup
25. Compliance reporting
26. Change of address processing (can be on multiple systems)
27. Fraudulent account closing
28. Customer complaints processing
29. Data cleansing
30. Straight-through processing of customer orders
31. Order updates
32. Shipping notifications

Figure 5



**RAPID DEPLOYMENT**



**EXECUTION TIME**



**PRODUCTIVITY SAVING**

Figure 6

## Vendors

Different vendors offer different types of robotic process automation solutions. Some companies are focused on more of a consulting offering, while others offer software. Figure 7 lists CIO Advisor's Top 10 APAC Robotic Process Automation Companies of 2017.

Company Logo	Company Name	Company Management	Company Description
	Automation Anywhere	Mihir Shukla, CEO & Co-founder	Delivers RPA solutions to transform business processes across BPO, IT, Healthcare, Finance services, and Insurance companies
	Blue Prism	Alaistair Bathgate, CEO	Enables business operations to be agile and cost-effective through rapid automation of manual, rules-based, and back office administrative processes
	Daythree Business Services	Raymond Devadass, CEO	Daythree replaces the repetitive service process with an automated digital workforce especially by using software robots
	IntelliCog Technologies	Siddhartha Singh, CEO	End-to-end consulting and outsourcing company with laser focus on RPA and AI
	Kofax	Reynolds C. Bish, CEO	Leading provider of software to simplify business operations through a unified process automation development and deployment platform
	Kryon Systems	Harel Tayeb, CEO	Kryon Systems delivers innovative, intelligent Robotic Process Automation (RPA) solutions enabling digital transformation for enterprises
	Pegasystems	Alan Trefler, CEO & Founder	Delivers a cloud-based unified platform powered by RPA and AI for CRM and BPM
	QIHAN	Ryan Wu, CMO	Cloud-enabled intelligent service robots for customizable applications across various fields like healthcare, education, hospitality, security, retail, and personal use
	Softomotive	Marios Stavropoulos, CEO & Founder	Offers reliable and scalable RPA technology solutions, proven to deliver operational efficiency, reduce costs, and exposure to risks
	UiPath	Daniel Dines, CEO & Co-founder	Provides a automation platforms that enables global enterprises to design, deploy, and manage a robotic workforce for daily operations

Figure 7

There are three main types of RPA vendors: established technology providers, RPA focused vendors and business process outsourcing (BPO) providers. A company like Intellicog Technologies provides BPO – ready-made solutions, whereas a tool like UiPath is for companies to create and implement their own automated processes. Businesses can tailor solutions to their needs – just one reason it makes sense for companies to invest in RPA technology.

## What to Look for in Software

A company must know what key features a good robotic process automation software should have in order to maximize the capabilities. These include the total cost of ownership, ease of use and control, technical criteria and vendors.

### Total Cost of Ownership

First, there is the initial setup cost. This can be insignificant if current employees have the know-how to train bots. However, many vendors also offer setup to help speed up implementation.

There are also ongoing fees to consider. Different vendors have different pricing models, so there are many options for businesses – further demonstrating why companies should invest in robotic process automation.

With technology changes and updates, businesses must also think about maintenance costs. As these issues can usually be dealt with in-house, the cost is not necessarily directly quantifiable but is worth considering when choosing software.

### Ease of Use and Control

Ease of use is vital as well – the solution must be simple and efficient, otherwise, it defeats the purpose of implementing RPA. Another crucial feature is ease of control, how easy it is to make adjustments while the processes are running. For example, stopping or adding bots during maintenance or for a system volume increase.

The availability of training is also important. Whether through online tutorials, text or in-person training. Many vendors offer community forums and online training material supplemented by existing users. This is useful because the support comes from others using the

software, therefore the advice may be more relevant. Figure 8 shows UiPath’s resources page, just one vendor’s support options – a forum, a UiPath Academy, video tutorials and more.

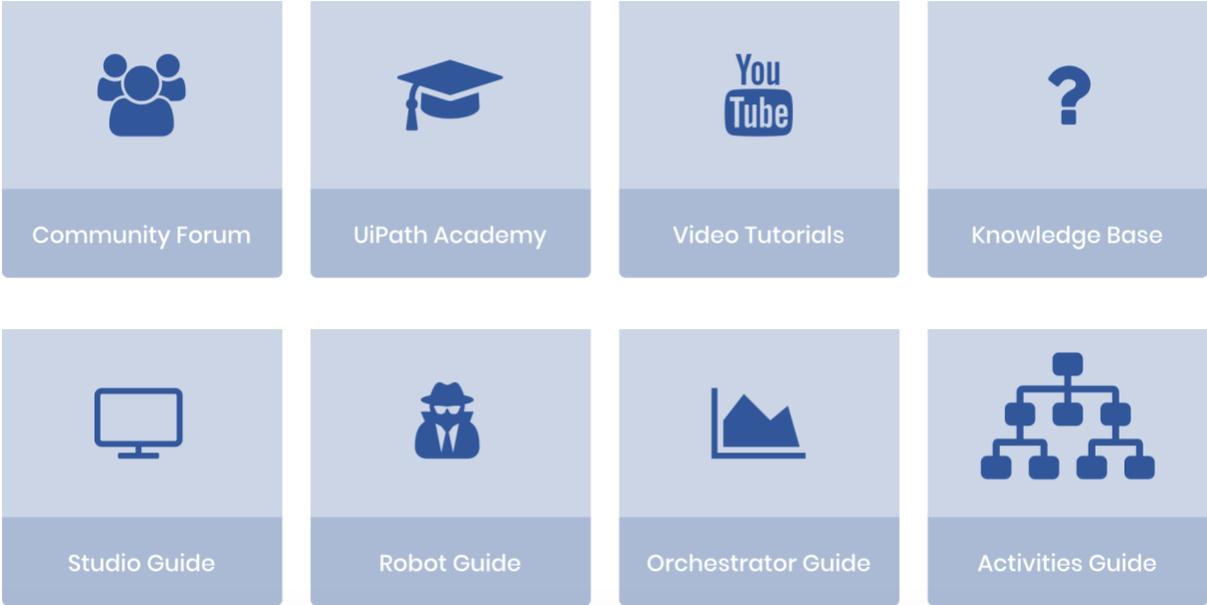


Figure 8

Kryon Systems offers e-books, case studies, infographics, brochures and videos (Kryon).

Another vendor, Kofax, gives customers several choices for services, as seen in Figure 9. Within their training option, they have education services, courses and on-site training.

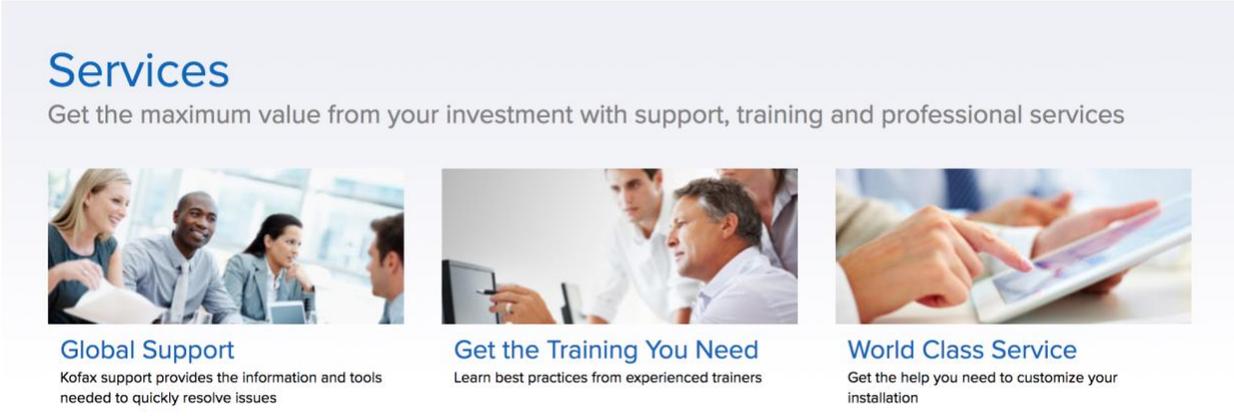


Figure 9

## Technical Criteria

Scalability is one of the most important considerations; even if a company plans to start small, the ability to increase with demand is key.

Security is critical in all business activities and robotic process automation is no exception. The bots could be working with customer data, supply chain data or any other type of sensitive information. Therefore, it is vital that the selected option has security at different levels to protect the data and the company.

Another significant feature to keep in mind is a solution's ability to integrate with other applications and systems. This ability makes RPA advantageous to a company and helps them further their goals.

The overall intelligence of the solution is also important. The digital workforce should ideally be able to "read and write to any data source, support simple task-based activities and leverage more advanced learning to further advance automation" (Galusha). A solution that is smart and nimble furthers a company's competitive advantage, again showing why businesses should employ RPA.

## Vendors

As mentioned previously, knowing the different options vendors offer is important as well. Companies must know what they are looking for in software before choosing a software and vendor. Another aspect to consider is vendor support – how much help a company wants and needs. Some companies may need more help than others, but with the multitude of vendors available they have many choices, which makes RPA a viable solution for most businesses. A reason companies may not want to use RPA is the misconception of needing

significant technical know-how. But between the option of ready-made solutions and in-house creation software, employees can easily learn to implement RPA.

## Benefits

The biggest reason companies should invest in robotic process automation, beyond customizability, are the benefits. RPA offers cost reduction, a boost in capabilities, higher efficiency and accuracy, improved compliance and an ease of change management.

### Cost Reduction

Companies are constantly looking to decrease costs which is one major reason they should utilize RPA. Work is not only completed faster but RPA can be used to automate repetitive tasks currently done by employees. This allows workers to be reassigned to more high value and complex tasks which will save the money currently being spent on man-hours performing automatable tasks.

Not only does RPA decrease costs, there is also a significant return on investment. In an analysis of 16 case studies by the London School of Economics' Department of Management regarding RPA, they found a "return on investment that varies between 30 and as much as 200 percent in the first year" (Willcocks).

Cost is a big reason many businesses do not implement RPA solutions, but the savings and return on investment show that it will be the right choice in the long run.

### Boosts Capabilities

Through scalability and flexibility, RPA strengthens a company's competencies. RPA contains many reusable components and their "scale is much better than approaches for screen scraping, macros and scripts" (Steinberg). Companies can also build a library of these

components and use it continually; this adds to the replicability of processes across business units. Another area that receives a boost is capacity. Because of a higher processing volume, the increase in speed correlates to an increase in capacity (Guyonnet).

### Efficiency and Accuracy

Bots can work 24/7 which immediately demonstrates the increase in efficiency they offer. Figure 10 shows some figures from RPA implementation in the finance and risk banking sector. They found that service levels could “increase to 100% accuracy as well” (Guyonnet).



Figure 10

Humans make mistakes. When humans complete routine tasks the number of mistakes can compound. Machines don't make errors. “Once the RPA setup is complete, manual errors are eliminated” (Dilmegani). Of course, there may still be outlier cases of mistakes, but changes in the RPA industry are working to eliminate these, or at the very least, provide a way to catch them so they can be easily fixed.

### Improved Compliance

Through RPA, an audit trail is maintained, in case issues ever arise. And because there is less human interaction with sensitive data, the probability of fraud and compliance issues is reduced (Dilmegani).

### Ease of Change Management

“Robots preserve application and data integrity by leveraging the existing application presentation layer and re-using existing application logic, databases and validation without

deep understanding and re-engineering” (Jain). The misconception that all new technologies create massive disruptions may be a reason companies choose not to use RPA. However, RPA is very non-invasive; businesses don’t have to make major organizational changes in order to implement it – which is a big reason companies should invest in RPA. It can simply be added and integrated with current software.

Overall, the multitude of benefits offered by robotic process automation, many of which are summarized in Figure 11, outweigh the possible cons and demonstrate why businesses should definitely implement RPA.

### What are the overall benefits of RPA?

The key benefit of RPA is that it is a non-invasive technology which leads to considerable saving potentials.



Figure 11

## Personal Experience

### NextEra Energy

During my 2017 Summer Internship, I worked with a Robotic Process Automation team at NextEra Energy – with principal subsidiaries NextEra Energy Resources and Florida Power &

Light. I was able to assist with a project for Integrated Supply Chain to automate the process of finding late purchase orders and notifying the agent. Before automation, this process required three employees. After automation, these employees were able to focus on more complex tasks. The process is estimated to save the company half a million dollars annually.

## Future Outlook

Robotic process automation will continue to grow and evolve. It is already shaping the current information technology landscape and companies should invest in it now to begin reaping its many benefits.

### Pairing with Other Technology

One area where RPA will develop is in pairing with technologies like cognitive computing, big data and machine learning. This will allow companies greater insight into their own practices as well as the ability to “accurately analyze and act on important data based on key performance indicators” (Ostdick).

### New Uses

One big future application is self-healing: robots monitor processes and correct issues automatically to lower error rate. This will help eliminate errors in automation completely, as well as reduce yearly cumulative IT costs. “In coming years, a higher percentage of technical issues will be resolved through self-healing and self-help solutions” (Kumar).

Another possible future use is an integration between chatbots and RPA for help desk automation, as seen in Figure 12. The combination of these technologies would hopefully create help desk bots that are essentially indistinguishable from humans but able to perform all the tasks required of one. AI technology is still growing, and “future evolutions of IT Service Desk automation will involve end-to-end deep learning” (Parlo).

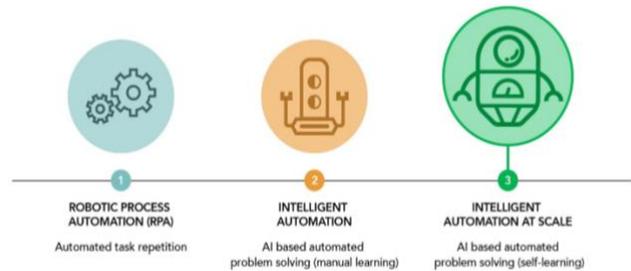


Figure 12

## Conclusion

Based on all the benefits and continued growth of robotic process automation it is clear why companies should invest in RPA. Even beyond simple cost savings, the value and competitive advantage generated through RPA make it an obvious asset for most businesses. Furthermore, there are many different options for RPA software. Most parts of the process are customizable, particularly when businesses create their own bots. But even when choosing a ready-made solution, businesses can choose from lists of vendors. RPA is continually growing, along with other useful technologies that could easily supplement and improve existing RPA technology.

While it may seem like this is a path to replacing human jobs, it is more about taking over mundane duties and then reallocating existing human resources to higher value-adding tasks. The tasks RPA takes over are repetitive and do not require judgment or complex thinking.

Overall, robotic process automation has more positives than it has drawbacks. More businesses should invest and implement this technology to reap the benefits, as well as to maintain or regain a competitive advantage.

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