



Automate this

The business leader's guide to
robotic and intelligent automation

Service Delivery Transformation

As the nature of work has changed, so too have the methods of automation.

Robotic process and intelligent automation tools can help businesses improve the effectiveness of services faster and at a lower cost than current methods, but with important limitations.

Global Business Services
Outsourcing
Shared Services

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Foreword

We have seen it in the movies...we have read fantastical futuristic fiction about it as youngsters in school...and now it is upon us: Robots performing human tasks.

The future posed by visionary film creators and novelists is still a bit further away, but the technological advancements which could make it possible are coming, and potentially with great speed. There is a buzz around how robots can transform business processes. We have been talking for years about robots—the droids that mimic humans in a factory—but now we are on the verge of seeing robots that replicate the human brain, rather than only arms and legs. Just like their physical cousins transformed manufacturing, these “virtual” robots are likely to change the way we run our business processes.

Robot-led automation has the potential to change today's workplace as dramatically as the machines of the Industrial Revolution changed the factory floor. Core skills that are related to business—process knowledge, technology integration, and insightful analytics—could be delivered through a leveraged model at a lower cost. The capability and demand already exist for this technology, and it is enabled by abundant computing power and software solutions that can be packaged and downloaded as “apps.”

So why do we need robots to run business processes in the first place? Well, to begin with many of our business processes are not as intelligent as they could be. Some of them cut across many IT systems that do not always talk to each other. Others are just too time consuming for humans to perform. To run them smarter is however an expensive proposition. It often involves a massive IT transformation such as an Enterprise Resource Planning (ERP) implementation or a toolset such as a business process management system (BPMS). Other business processes rely on insights based on human reasoning that computers have not been able to replicate.

Therefore, today's business conditions are ripe for major change and the emerging technologies within the robot-led automation realm could just be the solution. But the hype about these solutions taking over the workplace obscures the reality, and can confuse the casual observer. There are actually two separate genres of automation tools emerging, both of which have the potential to make our processes smarter and more efficient, in very different ways. The first is a set of tools classified as “Robotic Process Automation (RPA),” which has been maturing quietly over the last decade, to the point where they are now used for enterprise-scale deployments, very quickly and at very low cost. The second genre is “Intelligent Automation (IA)”—tools

enabled by cognitive technologies,¹ nascent, but with hugely transformative potential in the near future. We liken the current state of the RPA and IA landscape to the transitional years of ERP tools. Remember various ERPs, before the graphical user interface and the wonders of the data warehouse? Robotic tools are in a similar state today. Just as capabilities of the ERP tools exploded as successive releases leapfrogged each other and customer support offerings become increasingly user friendly, we see similar capability trends in the robotic space.

Alright, but what exactly are these robot-led automation tools and how similar or different are RPA and IA from each other? When should we use either of them, and how is the supply side geared to start solving our problems?

Given such interest on the demand side, the ongoing maturation of available tools, and the promise of new ways of working in support of a world class, advanced service economy, this is a good time to provide a comprehensive report on this emerging space. We combined efforts to research this area in depth. To better understand the RPA space and market capabilities, we reached out to a number of suppliers with an extensive data request coupled with further discussions and technology demonstrations with some of those suppliers.*

* In some sections of this paper, we have used some products and vendors as examples to better illustrate a concept. The intent of these references is limited to the illustration of concepts, and is not meant to compare product capabilities or to recommend any particular solutions.

We also drew upon our experience, knowledge base, and tools in the areas of technology-enabled business transformation, shared services, and outsourcing. And finally, we spoke to end users and had a number of contextual conversations with experts in our network. It's important to note that while we had thorough discussions with suppliers regarding their claims of product capabilities, we did not independently validate their representations nor did we conduct formal reference checks or make any attempt to confirm the fitness for any purpose.

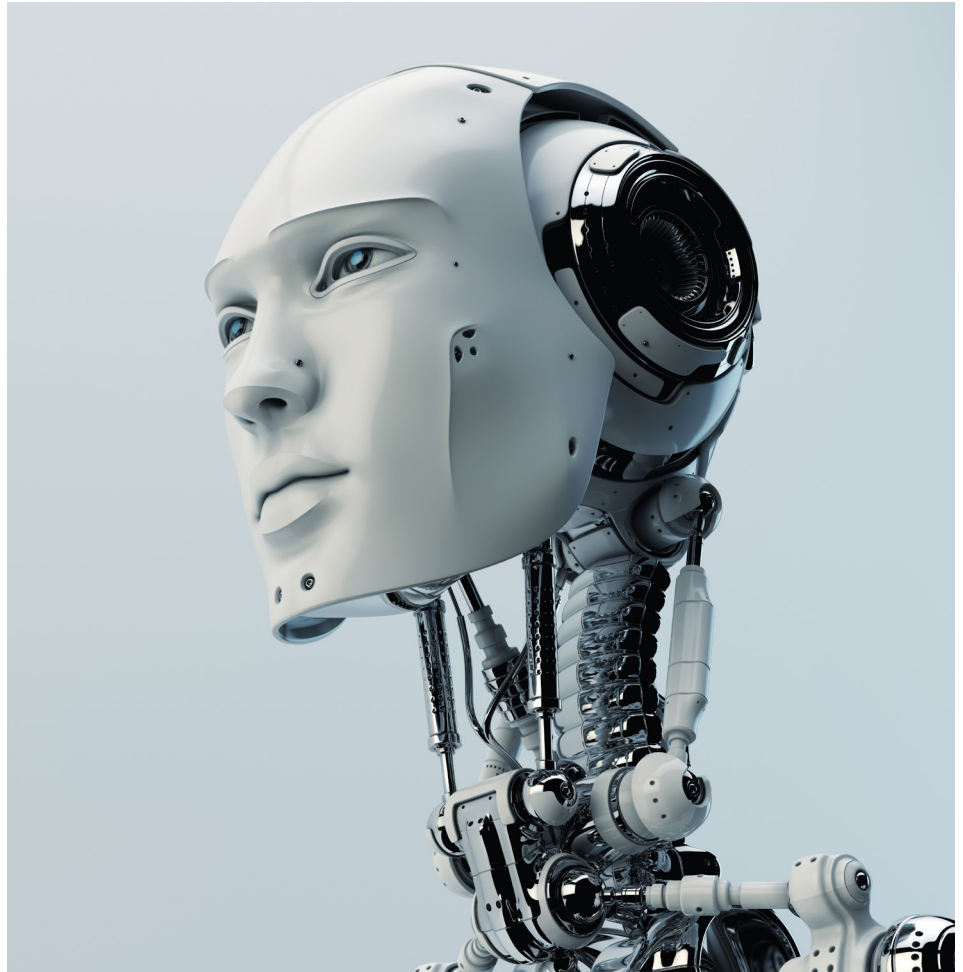
We have enjoyed this process as we jointly discovered the breadth, depth, and nuances of this space—and are delighted to bring this knowledge and perspective to the larger business reader base.

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Process automation: What and why?

Different means to the same end

Process automation is nothing new—organizations have always looked for ways to achieve greater operating efficiencies and support growth. Process automation at scale arguably began more than two centuries ago in the textiles industry, when factory machines began to be used for labor-intensive tasks such as weaving, stitching, and spinning cotton. Physical tasks of this nature are now widely automated across manufacturing and other industries, and developments in the field of robotic continue to lower the cost of automation while expanding the capabilities.

As the nature of work has changed, so too has the method of automation. For the internal operations of a modern business, the chief enabler of automation has been traditional information technology (IT). Many organizations have applied technology to business processes through the use of ERP and other business applications. However, some of those same organizations still have a patchwork of less-than-optimal business processes and applications that do not talk to each other and rarely ease the workload of generating meaningful insights—which translates into increased costs, unnecessarily high-cycle times, inconsistent quality, and impaired agility.

One possible explanation for this predicament is growth—few companies manage business growth systematically. Even organic growth often results

in expedient solutions to problems, inadequate attention to scalability of processes and technologies, and 'siloe'd' applications. Inorganic growth typically presents an even larger problem—bringing two disjointed organizations together and combining multiple sets of operations is difficult to achieve.

To date, organizations have responded to these challenges in various ways, including:

- **By investing in newer or better-integrated enterprise applications.** On paper, this typically represents the "right" approach, but such projects are expensive and many implementations fail. Even the projects that prove to be successful may take years to implement—and any effort to shorten the project time can compromise the chances of success and increase the risk of failure. Running costs may still be high after completion, and the long deployment times can limit agility.
- **By optimizing processes with the aid of a BPMS**—a software application that supports the process improvement life cycle, and often facilitates integration between enterprise applications to increase the amount of "straight-through processing" possible within a process. Effectively, this is a similar approach to that of an IT transformation, but with a smaller scope than ERP. They are generally less costly and lower risk to deliver, but may also offer reduced benefits.

- **By developing shared services and/or outsourcing processes to a third-party Business Process Outsourcing provider (BPO),** who will typically derive efficiencies through labor arbitrage and by virtue of scale. This is often a one-time labor arbitrage benefit, and many organizations have already realized these efficiencies, effectively hitting a 'ceiling' beyond which cost and performance can be further improved only through doing things differently.

Each of these options has its limitations. In the ongoing quest for operational efficiency, business leaders may keep asking how they can:

- Avoid or defer the high investment of large technology transformation programs while achieving their operating objectives.
- Support business growth without the proportional increase in operating costs.
- Derive greater value from already outsourced operations.
- Support product, process, and business model innovation, and test ideas without costly new technology.

Process automation presents a means to achieving these aims, and there are two genres of tools in particular that businesses should be aware of: RPA and IA.

RPA: Bringing automation benefits to small-scale processes

RPA tools can help businesses improve the efficiency of processes and the effectiveness of services. Classic process candidates that can benefit from RPA typically have repeatable and predictable interactions with IT applications including those that may require toggling between multiple applications (swivel chair). Rather than requiring fundamental process redesign associated with IT-driven transformation, RPA software “robots” are able to perform such routine business processes by mimicking the way that people interact with applications through a user interface

and also by following simple rules to make decisions. An example of a routine business process would be the retrieval of information from one system and entering the same information into another system or activating another system function.

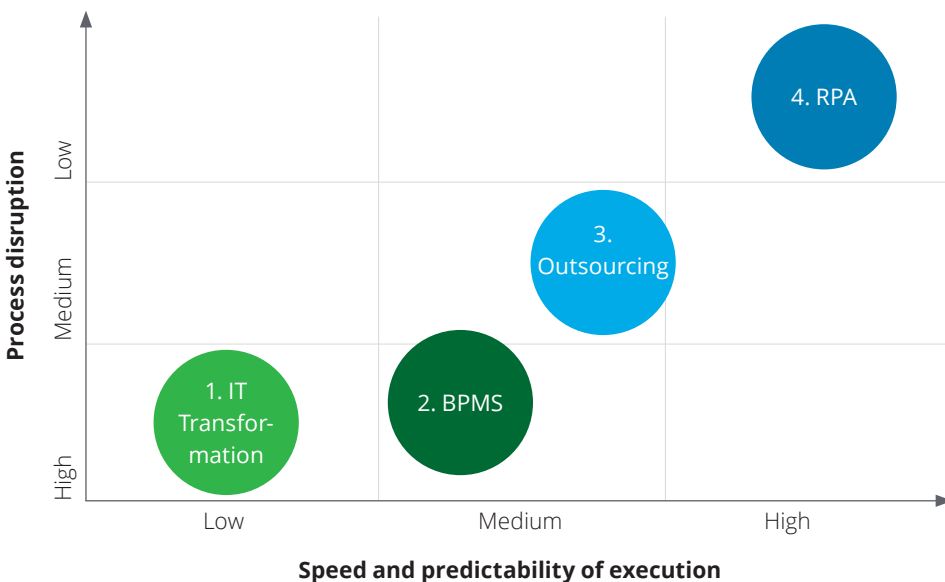
RPA tools evolved quietly over the last decade, but have now reached a level of maturity where process automation is possible at a significant scale. Entire end-to-end processes can be performed by software robots with very little human interaction, typically to manage exceptions. RPA software robots are not necessarily relevant to only a particular business

function or industry: any methodical, standardized, repetitive process that follows consistent rules and is wholly executed through a human-machine interaction is likely to be a good candidate.

With a license for a software robot likely to cost less than an onshore staff member or an offshore staff member, the commercial attractiveness of this approach is self-evident. There are nonfinancial benefits too, as robot-based process performance is designed to be more predictable, consistent, and less prone to errors as compared to a human process. Moreover, a robot workforce can typically be deployed in a matter of weeks. Once in place, new processes can often be assigned to them in days if not hours. Thus, RPA solutions generally have lower implementation cost, require shorter implementation time, and carry lower risk than large IT transformations. However, it is important to find the right processes and apply RPA judiciously.

In most organizations, there are many routine processes performed manually that lack the scale or value to warrant automation via IT transformation, but for which macros and other such desktop automation tools are too limited to effectively address. RPA can help address this gap, reducing the ‘minimum viable scale’ of process automation compared to other traditional options. See Figure 1.

Figure 1: RPA compared to traditional process transformation approaches



Source: Deloitte Analysis

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Organizations using RPA solutions typically experience benefits beyond cost reduction:

- **Decreased cycle times and improved throughput:** Software robots are designed to perform tasks faster than a person can and do not require sleep—making 24x7 operations possible.
- **Flexibility and scalability:** Once a process has been defined as a series of instructions that a software robot can execute, it can be scheduled for a particular time, and as many robots as required can be quickly deployed to perform it. Equally, robots can be quickly reassigned when other, more important processes arise—as each robot is typically capable of performing many types of processes.
- **Improved accuracy:** Robots are programmed to follow rules and robots do not make typos.
- **Improved employee morale:** The tasks and processes most suitable for automation are typically the most onerous and least enjoyed and employees relieved of them can be refocused on more rewarding and higher value activities.
- **Detailed data capture:** The tasks performed by a software robot can be monitored and recorded at every step, producing valuable data and an audit trail that can support further process improvement and also help with regulatory compliance.

IA raises the bar

Applied alone, RPA has great potential for automating routine tasks—those that are methodical, repetitive, and rules-based.

By contrast, nonroutine tasks—those involving intuition, judgment, creativity, persuasion, or problem solving—would appear to be very difficult to automate. But the decreasing costs of data storage and processing power are enabling rapid developments in the field of Artificial Intelligence, and creating a new breed of cognitive technologies with human-like capabilities, such as recognizing handwriting, identifying images, and natural language processing. When combined with robotic automation and powerful analytics, these cognitive technologies can form “IA” solutions that can either directly assist people in the performance of nonroutine tasks or even automate those tasks entirely.

The market for IA is still nascent. It was less than five years ago that IBM's Watson first broke on the scene, winning a highly publicized game of Jeopardy.² Since then, the marketplace has begun to develop, and pioneering enterprises are leveraging IA for assorted purposes:

- Wealth Management firms are using IA to review and analyze portfolio data, determine meaningful metrics, and to generate natural-language reports for their customers on the performance of each of their funds.

For a broader discussion on the potential impact of cognitive technologies, we recommend *Redesigning work in an era of cognitive technologies* (Deloitte Review Issue 17)—our interest herein is the use of cognitive technologies to enable Intelligent Automation solutions.
URL: <http://dupress.com/articles/what-is-cognitive-technology/>

Robotic automation examples

- A BPO provider automated 14 core processes with RPA, achieving a typical 30% cost saving per process and improving service quality and accuracy.¹
- A medical insurer used software robots to process claim adjustments, with a 44% cost saving compared to manual administration.²

1 Source: Blue Prism

2 Source: Cognizant Trizetto

- Global banks are leveraging IA to improve the regulatory compliance processes by monitoring all electronic communications of employees for indicators of noncompliant activities.
- Insurers are using IA to answer the queries of potential customers in real time, and to increase sales conversion rates.

The uses of IA are potentially limitless, but also more expensive. Unlike RPA tools, which are very broad in their applicability, IA solutions require more extensive configuration and machine learning that is specific to a much narrower business purpose and the complex scenarios it may encounter. Also, IA solutions often take longer to implement.

Below is a high-level summary comparison of RPA and IA tools:

- While RPA tools can be used only for rules-based, routine tasks, IA tools can drive value by improving non-routine tasks requiring judgment.
- IA tools are typically used to provide leverage to existing functions, focusing on increasing value rather than reducing cost. In the examples above, the Wealth Management organization may not have been able to produce natural language reporting across all of its customers and funds without a vast expansion of its workforce. Now, fund managers can focus on communicating with their clients rather than reporting to them. The compliance analysts at the global bank could not possibly monitor all electronic communications without the aid of IA, and the insurer may not be able to

answer individual customer queries as quickly. In all these cases, IA tools have helped these businesses to extend their services, potentially improving the value they deliver to their customers. RPA tools on the other hand allow businesses to execute the same services at a lower cost and at a higher level of quality. While this distinction may not always hold true, it does help in broadly categorizing the applicability and the value delivered by these two distinct technologies.

- RPA tools can be implemented much faster than IA tools and typically require lower investment.
- The RPA supply market is maturing rapidly and there are several products in the market that have demonstrated their effectiveness. IA tools are rapidly improving in capability, but overall are still in a nascent stage of development.

Know your robots!

	Robotic process automation	Intelligent automation
Automates tasks that are... Routine: Methodical	Routine: Methodical, repetitive, rules-based	Non-routine: Requiring a thoughtful consideration
Able to...	Follow instructions	Come to conclusions
Application is...	Broader: Can automate any suitable process	Narrower: Application should be targeted to deliver meaningful, insightful outputs
Market offerings are...	Maturing	Emerging
Implementation and ongoing costs are typically...	Lower	Higher
Implementation timeframe are typically of the order of...	Weeks	Months

Nuts and bolts: Basics of enterprise automation using RPA

With some large organizations now operating virtual workforces of 500+ robots, RPA has reached a point where it can be said to be capable of “enterprise automation.”

We spoke with several RPA vendors to understand their solutions in detail, and while there are nuances and varied nomenclature among the various products, they all broadly comprise three fundamental elements: A set of developer tools, a robot controller, and the software robots themselves.

The developer tools are used to define “jobs”—the sequences of step-by-step instructions that a robot can follow to perform the business process, including any business rules or conditional logic (such as “if/then” decisions). They focus on ease of use, so that business users without prior ‘coding’ experience can use them. “Drag-and-drop” functionality is common, along with simple configuration wizards. Some tools, like those of Automation Anywhere and UiPath, include a “process recorder,” which can be used to capture a sequence of user actions and speed up the definition of a process. Developer tools are typically hosted on a server.

Micro-enterprise automation at Stacked restaurants

Brian Pearson is a strong advocate of enterprise automation. He initially came across RPA tools over a decade ago, while responsible for IT at a chain of restaurants. By their nature, restaurants have distributed operations and gathering and collating operational data—such as takings, timesheets, and tips—is onerous but critical, and he was looking for a way to support the expansion of the business without the associated growth in the back office. By aggressively pursuing standardized processes and maintaining an “automate and repeat” mantra, the back-office grew very little under his watch while the chain increased from 20 to over 100 locations.

In 2010, Brian moved to the newly founded Stacked Restaurants. Stacked is primarily known for its tablet-based ordering and highly customizable menu. Equally interesting is the automation-driven back-office that Brian has established. With the lessons learned from his previous experience, Brian architected automation-driven business processes from scratch, such that the entire back-office is run with very little manual intervention on a day-to-day basis. Reports and exception alerts are automatically produced, leaving management to focus on the business decisions. Further, Brian has used automation to improve other aspects of the business, such as gathering and comparing data from the hosting and ordering systems and sending an alert to the serving staff when a particular table has not ordered within five minutes of being seated – a good indicator that they may need guidance with deciding their menu choice or using the tablet-based ordering device. Without automation through RPA tools, Brian would have had to hire a team to perform these tasks.

Brian’s story demonstrates the use of RPA to support business growth without necessitating the equivalent expansion of back-office operations, and the potential of using RPA to underpin new services—as applicable to a large enterprise trying to foster innovation as to a small one.

The instructions provided to robots need to be very detailed, and can become complex to visualize, so interactive diagrams that allow layering or nesting of substeps in the job are a common feature—and breaking jobs down into smaller building blocks comprising common tasks is important for effective and consistent re-use across multiple processes.

The robot controller is key to enabling process automation. It typically plays three key roles:

- Provides a master repository for the defined jobs. For enterprise use, version control is a critical feature, as is the ability to safely store credentials for various business applications so that they are only provided to robots when required (and ideally in an encrypted form).
- Supports operational governance with the ability to assign appropriate roles and permissions to users and provide controls and workflow to govern the process of creating or updating, testing, reviewing, and approving, and then finally deploying jobs to the robot workforce.

Some solutions, such as that of AutoMate, support integration with mail servers, applications, and other systems to aid the management of users.

- Assigns jobs to single or grouped robots to execute—and monitors and reports on their activities. The functionality associated with scheduling and assigning work to robots, as well as understanding their status and capacity, becomes increasingly important as the number of processes and transactions grow. For example, Blue Prism's solution uses prioritized work queues so that robots always process the most important transactions first.

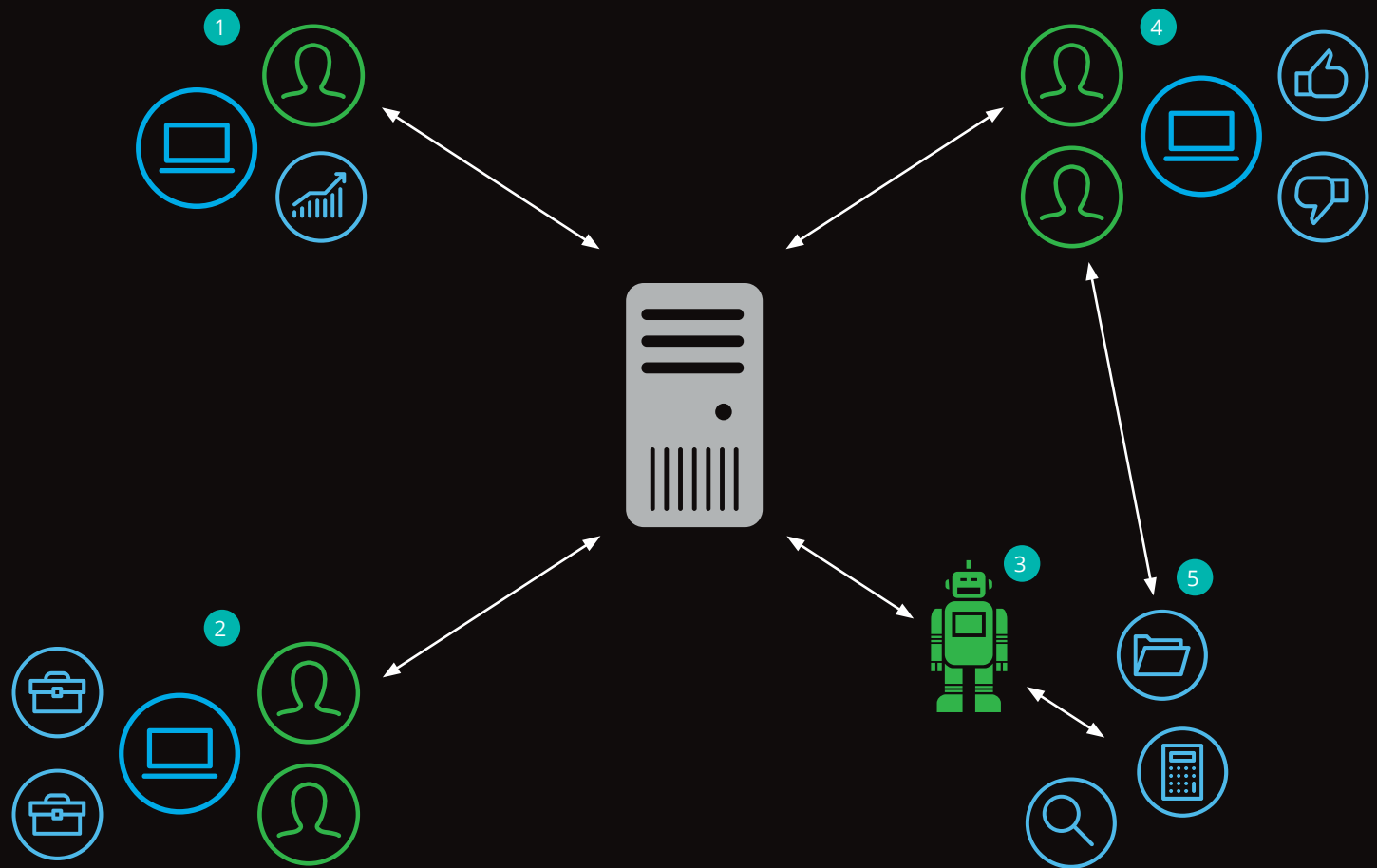
Like the developer tools, robot controllers are also hosted on a server.

Once issued their instructions, the software robots (also referred to as “clients” or “agents” that reside on a desktop) carry them out, interacting directly with business applications to process transactions. The list of actions that a robot is capable of performing can stretch to over 600 in some

solutions, and additional actions can often be custom created using code.

When interacting with the user interface of a business application, the preferred approach is for the robot to identify the important elements (such as entry fields and buttons) by their labels in the underlying application code—this can make the robot resilient in response to purely cosmetic changes such as relabeling fields and moving buttons. However, when working with virtualized desktops, the application code is not exposed to the robot, so it must rely on more brittle methods such as using the pixel-based object location (relative to the edge of the screen or a position identified using simple image matching).

Finally, whether for compliance, audit, or identifying further process improvement opportunities, it is important for software robots to be able to log—in detail—the actions they take and decisions they make.



Robotic process automation in action

01. "Process developers" specify the detailed instructions for robots to perform and "publish" them to the robot controller repository.
02. The robot controller is used to assign jobs to robots and to monitor their activities.
03. Each robot is located on a client environment—which may be virtualized or physical—where it interacts directly with business applications.
04. Business users review and resolve any exceptions or escalations.
05. Robots are capable of interacting with a wide range of applications.

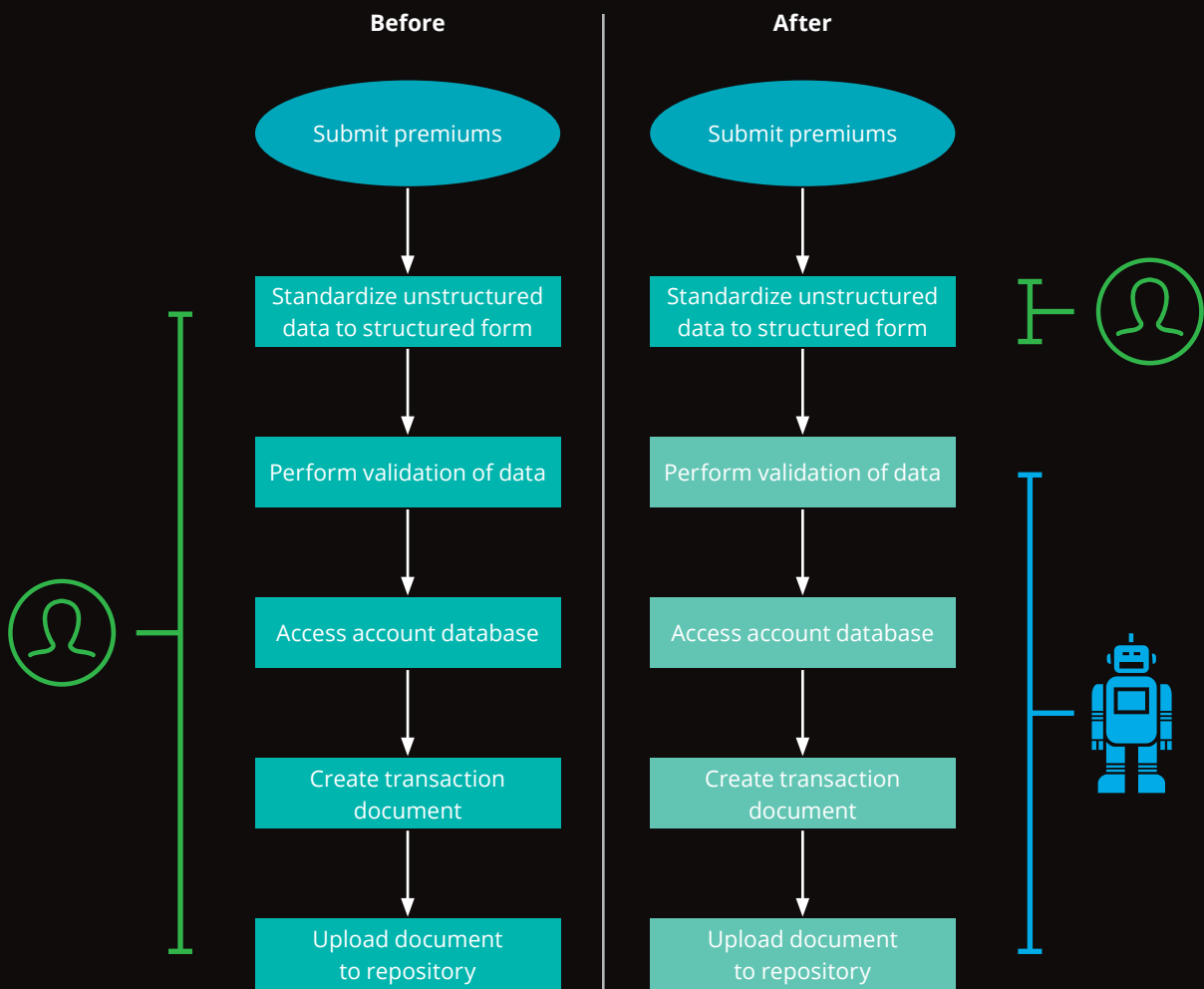
Sample functions of software robots:

- Opening emails and attachments
- Logging into web/enterprise applications
- Moving files and folders
- Scraping data from the web
- Connecting to system APIs
- Following "if/then" decisions and rules
- Extracting and reformatting data into reports or dashboards
- Extracting structured data from documents
- Collecting social media statistics
- Merging data from multiple places
- Making calculations
- Copying and pasting data
- Filling in forms
- Reading and writing to databases

Poppy the robot

“Poppy” the robot was used to automate the most onerous steps in the process of creating and submitting London Premium Advice Notes (LPANs) to a central insurance market repository. Prior to the introduction of Poppy, processing a batch of 500 LPANs took several days. After Poppy was trained to automate part of the process, the processing time was reduced to around 30 minutes, with a negligible error rate.

Poppy was welcomed rather than feared by the operations staff, who requested that Poppy be trained to take on further processes.



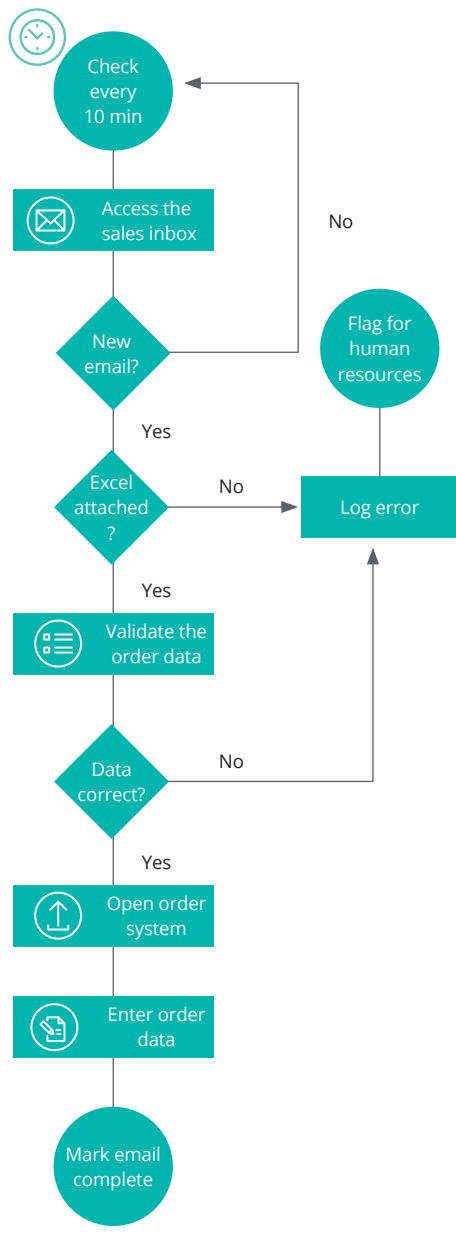
Breaking through the hype: Six myths of RPA and IA

Automating digital media requests

One person was dedicated to processing internal orders for digital media, received as spreadsheets attached to emails to a team inbox. The process required careful examination of the complex request forms to validate the data before copying the request into the order system. The volume of orders was highly variable, and in busy periods there would be a longer delay between receipt of the request form and entry into the system.

The process was automated using a single robot, which required no more than three hours a day to process all requests. The person who had previously performed the process now resolves any exceptions due to bad data, has been redeployed, and his remaining time is reassigned to other tasks.

With only three hours spent processing requests, the robot still had more than 85% capacity remaining that could be spent on other processes.



Through our research and discussions with vendors of both RPA and IA solutions, as well as organizations that have deployed them, we have noted six common misconceptions.

Myth: You need an army of robots to make

RPA worthwhile In fact, one of the main attractions of RPA is the ability to automate the “long-tail” of low-volume or low-value processes that would not be economical to address via other means.

However, there is still a minimum scale required to realize both the return on the upfront investment of establishing an automation capability, and the ongoing overhead of running one. It is also common for vendors to specify a minimum number of licenses to purchase. Such minimums are usually not prohibitive, though tools that are more squarely aimed at the “enterprise automation” portion of the market may not be cost effective in smaller implementations (though less expensive tools may not scale up as effectively in an enterprise-wide deployment). It is quite possible in today's market to see positive results with the deployment of a few robots.

It is quite possible in today's market to see positive results with the deployment of a few robots.

Myth: Robots will take our jobs

In 1930, John Maynard Keynes³ predicted that the future held mass unemployment, as developments in technology would replace jobs faster than new jobs would be created. While this may not have played out as quickly as he expected, recent years have seen yet more dire forecasts relating to the potential of computers to replace human workers—including last year's prediction by analyst firm Gartner that one in three jobs will be automated by 2025.⁴

We certainly acknowledge that software robots are capable of automating many tasks currently performed by people in the workplace—and as cognitive technologies fuel increasingly 'intelligent' automation, the realm of what is possible to automate will expand.

But our review of case studies of organizations that have deployed automation suggests that the majority of organizations we studied are focused on increasing the efficiency and effectiveness of their workforce rather than eliminating it, and the people relieved of routine tasks are re-focused toward more valuable or rewarding activities. Furthermore, with more advanced and complex automation comes not only increased efficiency, but also an increased dependency on the accuracy and skill of the human operators involved.

Increased automation of tasks does not necessarily lead to loss of jobs—workforce augmentation, rather than replacement, may be a more likely outcome. By freeing up a person's time, employees can now focus on more advanced and engaging tasks, and over time organizations could see lower turnover, higher morale, and increased internal innovation.

Myth: Robots can now think like humans

Neither RPA nor IA solutions replicate human reasoning. RPA software robots mimic the behavior of humans in the way they can interact with application user interfaces, but they must follow highly methodical instructions and simple conditional logic.

IA solutions are underpinned by cognitive technologies, which are increasingly capable of human abilities such as understanding natural language and recognizing images, and can learn from observing humans. Even so, IA still requires training from humans and cannot yet fully replicate human reasoning. For a deeper understanding of cognitive technologies, we direct the reader to *Demystifying artificial intelligence: What business leaders need to know about cognitive technologies* (Deloitte University Press, November 4, 2015).

Intelligent automation

- Narrative Science Quill™, the company's advanced natural language generation platform, is designed to analyze data and produce natural language output—automating preparation of reports for diverse uses like investment portfolios and personalized customer communications.¹
- IPsoft's Amelia is a virtual agent who is designed to converse with customers to gather information and resolve their queries faster and more consistently than a person could.²

¹ Source: Narrative Science

² Source: IPsoft

Myth: BPOs are doomed

RPA tools add to the traditional process transformation options, rather than replacing them. In fact, BPO providers could benefit greatly, and many are actively exploring (if not already using) RPA tools, either to lower their cost of delivery, or to join new specialist service-providers in offering “robots-as-a-service.” BPO firms that successfully integrate automation often seek to substantially improve their profit margins, even if revenue growth slows.

However, growth of RPA as a transformation option should affect your outsourcing strategy, whether you are considering outsourcing or already have an outsourcing partner. In the latter case, you should discuss automation with your BPO to understand where it presents a mutually beneficial opportunity.

Myth: Robots are infallible

While software robots may follow rules without deviation, do not need sleep or vacations, and will not make typos, they are prone to their own sources of failure. Like any machine, reliability is not 100%. Poor quality input data can cause exceptions, and while the ways in which robots recognize

the elements of application user interfaces are quite robust, they are not completely impervious to system changes—particularly when interacting with remote environments.

In addition, robots have no “common sense,” so if a flaw in your organization’s robot management process allows an obvious error to creep into the instructions provided to your robots, they will still follow those instructions to the letter—and replicate the error hundreds or thousands of times until someone spots it.

Myth: RPA will significantly reduce the importance of your IT Department

RPA can be used to automate processes across business applications in a “noninvasive” manner, which can reduce reliance on IT for deployment. But while some subset of roles in IT may be reduced, others may increase and overall the reliance on IT is far from eliminated. In the same way that you would expect your human workforce to comply with policies and procedures relating to sensitive or customer data, you must confirm that any “virtual workforce” accessing those data is also compliant. IT typically takes responsibility for systems infrastructure, security,

resilience/recovery, and governance, and these functions are as important as ever—so IT should be involved from the outset. In addition, if an automated process experiences any problems, the users’ first call is still likely to be to IT.

Deploying RPA without keeping IT informed can lead to unexpected challenges, as one organization found when their robots were so efficient at executing the processes that the rapid activity triggered security alerts. Eventually, the IT team came to see the value of RPA. Hence, it is better to include IT and other affected functions in the RPA program to enable a stable rollout. Further, although software robots may be able to interact with business applications via the user interface alone, in many cases they can be more effective when integrated ‘behind the scenes’ using more robust system APIs—often made easier with the support of IT.

In fact, in some organizations, proactive IT functions are the buyers of RPA solutions, looking for cost-effective means to better support and enhance the experience of their business partners.

Dip your toe ... or dive in?

Look before you leap

There are many organizations that can benefit from RPA, and you should now be considering the opportunities within your organization. There are typically five steps to developing an automation strategy—beginning with the idea of a proof of concept or pilot implementation first:

What?	Why?	How?	Who?	When?
Assess for automation opportunities <ul style="list-style-type: none"> • Which processes are good candidates for automation? • Which processes would be suitable to pilot? • How should the process owners be engaged to try automation? • What are the impacts of proceeding with the pilot? 	Build your business case <ul style="list-style-type: none"> • Why does automation support your business needs? • What are the benefits? • What are the pain points being alleviated? • What are the metrics to determine whether automation is valuable? • What is the strategy for re-deploying existing resources after automation? 	Determine the optimal operating model <ul style="list-style-type: none"> • Which operating model works best for your organization? • Do you have the right team to support the solution and carry out responsibilities (e.g., assessing new processes for automation and testing the automated jobs)? • Who will manage and monitor the software robot? 	Identify your automation partner(s) <ul style="list-style-type: none"> • Who are the main vendors in the RPA space? • Who are the providers who cater to your business needs the most? • Which sourcing option do you want? • How should you compare the pricing models in order to understand what you are paying for? 	Plan the automation roadmap <ul style="list-style-type: none"> • How long should your pilot be? • What are the stages after the pilot? • What is your strategy for scale? • How will you ensure impacted stakeholders understand the what, why, and how of automation?

1. Assess for automation opportunities (What?)

Begin with an assessment of your process landscape to identify opportunity areas: Good candidate processes are those which require manual interaction with a computer interface, are largely rules-based, consume a significant amount of time, and are performed at frequent intervals. Less important is whether the process is performed by an individual or multiple people—RPA is good for addressing work that is distributed across people or departments. Ideal candidate processes (particularly for an initial pilot) are low risk, yet have potential for significant reduction in effort. Address pain points as you go. Work with the process owner to determine the readiness for automation of individual processes. How well understood is the process? Has it, or can it be documented in detail? Thorough analysis up front can help avoid surprises down the line.

2. Build your business case (Why?)

Estimate the benefits of automation on a process-by-process basis. If resources can be relieved of tasks through automation, where will their freed-up time be spent? How does improved accuracy or increased speed translate into value?

At this stage, consider automating some pilot processes to prove the concept, and allow precise measurement of the benefits. Pilots can also help obtain buy-in from your stakeholders, improve understanding of both the potential and the limitations of automation, and identify the key success factors in your environment. Good pilot candidates do not need to be large-volume processes, but they must be performed with some frequency; it is difficult to measure the benefits of automating a monthly process during a six-week pilot.

3. Determine your automation-operating model (How?)

Decide whether you wish to establish a strategic automation capability within your organization, or simply desire an automated outcome with the minimum of effort: this will affect your automation operating model and determine your sourcing options.

If building an internal capability for automation, consider who will be responsible for assessing, mapping, and prioritizing new processes for automation; who will develop and test the automated jobs; and who will manage and monitor the software robots as they perform them—particularly where they span intra-organizational boundaries. As a tool that targets relieving mundane tasks, RPA is likely to give better results in the hands of skilled users: many organizations develop an Automation Center of Excellence to facilitate training and the sharing of knowledge and best practices.

In either case, at this point it is critical to put in place the foundations for governance, including obtaining the support and input of IT.

4. Identify your automation partner(s) (Who?)

Consider your sourcing options, and which type(s) of automation partner you are looking for. You may already have worked with a partner to pilot some processes—but you are not wedded to that partner.

You should approach the selection of your automation partner(s) as you would any other strategic technology or sourcing procurement, considering both your current and future needs. Some providers have more experience in particular industries and others in certain types of processes. If procuring an automation tool, prepare evaluation criteria appropriate to your requirements. Vendor demonstrations are valuable, but it is a good practice to supplement vendor demos with client references to confirm on-the-ground realities and appreciate complexities and challenges.

Consider which pricing model(s) will best align with your business objectives, and compare pricing carefully; RPA vendors may appear to have similar pricing structures, but one vendor's "robot" may not be equivalent to another's "agent" or "client." It is difficult to estimate what the throughput of a software robot will be for your specific processes (compared to a human), so determining the required number of robots and making meaningful comparisons between vendors is difficult. Be prepared to share clearly documented details of the processes you have prioritized for automation with vendors to help draw the most meaningful price comparisons.

Typical sourcing options

- **Direct:** Buy RPA licenses directly from the vendor
- **Direct with support:** Buy RPA licenses directly from the vendor and engage a services partner for configuration and support
- **Outsource:** Work with a traditional BPO provider, for a "business process-as-a-service" or "robots-as-a-service" arrangement

Common direct to RPA pricing models License based (most common)

- You pay per software license for each installed robot, management server, and development tools
- Perpetual license or annual subscription
- The definition and capacity of a "robot" can vary by vendor, making direct comparisons tricky
- Hardware and maintenance will add to the cost

Value based

- Pricing is linked to either the FTE-equivalent savings (e.g., a fixed percentage of the FTE cost that would have been occurred), or to each completed transaction
- Can be restrictive to horizontal-scaling across the organization, as contracts will need re-evaluating to include additional business processes
- The vendor is encouraged to put "skin in the game" and maintain a good level of service

Service based

- You pay a regular subscription fee for the service, with a service agreement that defines the responsibilities of the provider
- This model is particularly attractive for IA solutions, which may run on complex big data technologies that can be expensive to set up and maintain in-house, or are needed on a spot basis

Questions your employees will likely ask

- What is RPA?
- Why are we deciding to deploy it here at our company and for this process?
- How will this affect my role? Is a robot replacing me?

A sample checklist to launch an automation program

- Allow sufficient time for deployment and automation development
- Confirm that processes are properly understood and documented
- Fully account for the handling of errors and exceptions
- Identify ways to mitigate any organizational resistance to change
- Bring IT onboard early
- Gather or prepare representative test data
- Confirm that there are no system or data access issues
- Resolve data quality issues before automating
- Develop a thorough disaster recovery plan
- Provide up front and ongoing training to end users
- Be sensitive to fear of job loss and “being replaced by robots”
- Confirm that you are prepared for maintaining the solution post-deployment
- Account for headcount reduction or redeployment or role definition

5. Prepare the automation roadmap (When?)

Your road map for automation should look beyond the initial deployment and set out how automation will grow within your organization.

Like other transformation programs, communications, training, and change management are all critical. Before you begin the automation journey, you must confirm that impacted stakeholders clearly understand the what, why, and how of automation. Your employees can also help identify candidate processes for an automation platform, which employees can use to describe their processes and recommend them for consideration.

Your road map should also account for any supporting initiatives on which successful RPA is dependent. For example, a commonly encountered obstacle is poor data quality preventing successful autonomous transaction processing. Where known data quality issues exist, you should incorporate remediation activities into your plan.

Your road map for automation should look beyond the initial deployment and set out how automation will grow within your organization.

A glimpse of the future

RPA has the potential to benefit a large number of organizations and in the near future, the number of large-scale RPA deployments could increase dramatically. IA, while still nascent, holds enormous transformative potential, and organizations should be actively monitoring the market and considering strategic opportunities. As robotic solutions grow more robust and intelligent solutions become more powerful, we see three potential flavors of convergence: within the market, across solutions, and among processes.

Market convergence

Considering the rapid growth that both RPA and IA vendors are currently experiencing, and the enormous market potential for both types of offering, there is potential for some convergence in the market place in the near to mid-term. In particular, RPA presents a large potential threat as well as an opportunity to the traditional BPO providers. The reactions of BPO providers will be interesting to monitor. There could be an increase in strategic partnerships between RPA tool vendors and BPO and other service providers if not outright mergers and acquisitions.

Solution convergence

We spoke to a number of leading RPA software vendors about their product strategy and found two key themes:

- In anticipation of increasingly large deployments (and perhaps requests from BPO partners), many vendors are focused on the development of features for enterprise readiness, such as increasingly dynamic assignment of workload to robots, improved monitoring of robots' activity via dashboards and reports, and version control and release management functionality to support process definition and deployment across organizational boundaries.
- A current limitation of all RPA software robots is their inability to work with unstructured data. Recognizing this, the largest vendors are turning their focus to adding some elemental cognitive capabilities to their tools, such as for speech recognition, natural language processing, and extracting structured information from images such as scanned invoices and receipts.

As RPA and IA solutions are used more frequently together, they may be offered as "Analysis as a Service," providing end-to-end support for a particular business need. Merging the abilities of cognitive tools with the ability to rapidly and autonomously execute rule-based steps through RPA, providers can focus on providing integrated, business-specific solutions to their customers, potentially freeing the customers from the effort and expense of integrating the components themselves.

Process convergence

Over time, these integrated business-specific solutions could merge into intelligent systems that self-regulate large components of an organization. An analogy for these business systems is the body's Autonomic Nervous System, which regulates key functions like heartbeat and breathing without conscious thought, allowing the brain to focus on interacting with the world around it. These systems could operate as the 'heart and lungs' of an organization, taking in key data inputs and performing all of the internal processes that are core to the business. For example, in a manufacturing company, the system could respond to key stimuli like sales and customer data, and tune the core operations of the company, such as forecasting demand, optimizing and setting pricing, and managing the entire supply chain and production scheduling to optimize inventory levels—all on a "self-regulating" basis.

Alternatively, consider how IA tools could evolve for a wealth management company. While today wealth management services are able to use IA to give their clients customized portfolio reporting and recommendations, a truly autonomic capability could make it cost effective for companies to offer wealth management as

a service to customers with very low net worth. Automated customer interaction tools could provide customers with an intelligent point of interaction that could be much more intuitive and dynamic than a website, with the customer-facing system able to help the customer understand potential options in a situation and make decisions based on everyday needs, while the company systems curate options for the customer and manage the transactions in the background. A client might call the financial services company, tells an automated representative about the birth of a child, and the customer-facing system could recommend the creation of a college savings account, discuss the risks and benefits of selected approaches, manage the fund transfer, and allocate the investment to the selected vehicle. The entire transaction could take a few minutes while the customer is on the phone at almost no marginal cost to the company.

What about the humans?

Just as with prior waves of automation, we can expect that the IA will likely drive significant changes in the jobs that people do. Automation-driven systems could replace large numbers of knowledge workers doing managerial jobs; these "intelligent engines" could make detailed

demand forecast preparation seem as antiquated as home milk delivery. The armies of people who support these processes—in finance, IT, and operations—will have to find new avenues to add value. Innovation, sales and customer relationship development, and "teaching" the intelligent systems, are all potential areas for people to focus their efforts.⁵ IA has already begun to change businesses. As these changes accelerate, people will have to be more nimble than ever as they think about their careers, and what kinds of skills they—and their children—will need. Just as the notion of "lifetime employment" has faded, so too may the notion of a "lifetime career." People, and governments, may need to plan around multiple stints in education and training, in order to keep up with the frenetic pace of change. While daunting, people may consider this liberating, as we gain opportunities to reinvent ourselves and the world around us.

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Endnotes

1. For an introduction to the concept of cognitive technologies, their improving performance, efforts to commercialize them, and the growing impact we expect them to have, see David Schatsky, Craig Muraskin, and Ragu Gurumurthy, *Demystifying artificial intelligence: What business leaders need to know about cognitive technologies*, Deloitte University Press, November 4, 2014, <http://dupress.com/articles/what-is-cognitive-technology/>
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