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State of Robotics Process Automation (RPA), Q2 2019

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Abstract

This report is an Enterprise level-set on Robotics Process Automation (RPA). This technology is getting a lot of attention in enterprises today as it has the potential to provide more consistent and timely services for customers and internal stakeholders at a lower cost. In a nutshell, RPA is software that emulates the interaction of a human employee or contractor with applications and data in a repeatable workflow. RPA software platforms create a software robot (or "bot") which performs the task(s) originally done by people. Simple concept, but with powerful implications. In this report we include discussions of basic concepts, RPA benefits, use cases, the RPA life cycle, program governance, leaders in RPA software platforms, and recommendations for TVR clients.

Given the current significant interest in RPA there is a commensurately large amount of investment capital going into this space, but also some unrealistic expectations. We will look to net this out for our clients and give you a sense for where RPA is going.

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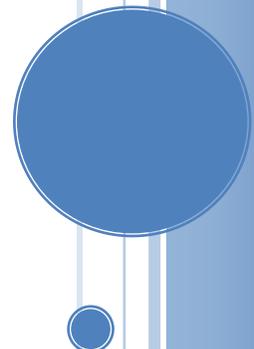Principal Consulting Analyst

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Executive Summary

Robotics Process Automation, or RPA, is a rapidly maturing technology that is changing the way companies get work done, across industries and across company divisions and specialties. RPA is a broadly useful technique that we expect to be of great interest to TechVision Research clients. In this report we cover:

- RPA Introduction and Basic Concepts

- RPA Benefits

- Example RPA Use Cases

- The RPA Life Cycle

- RPA Program Governance

- Leading RPA Tools and Products

- RPA Trends and Expected Future State

- Insights and Recommendations for TVR Clients

- Conclusions

Software automation is certainly not a new thing – by definition, all software automates some kind of task. What is special about RPA is that it emulates a person's interactions with computing systems – it is effectively a virtual user programmed to participate in a specific task and workflow. The virtual user is called a "bot", or software robot. This is a deceptively powerful and useful concept. In general, any repetitive task involving computing systems and people is a candidate use case for RPA. The more repetition, the more likely RPA will result in savings of time and/or money.

In large enterprises, RPA can be expected to result in a 20% or better cost savings when tasks are performed via bots rather than employees or contractors. In addition to directly measurable cost savings, RPA can provide other enterprise benefits, including:

- Improved quality

- Decreased time to service

- Improved compliance

- Increased transactional capacity

- Improved IT-business partnership

Bots are created and deployed using RPA platforms, proprietary software suites that are employed across the automation life cycle. For TechVision Research clients, there are clearly three leading, general-purpose RPA platform suppliers – Blue Prism, Automation Anywhere and UIPath. This

report provides a high-level comparison of those three.

The automation life cycle can be represented as six iterative phases, a life cycle TechVision calls "6D":

1. **Define** the automation program's scope, budget, goals, constraints, technology standards, etc.

2. **Discover** the automation opportunities (use cases)

3. **Design** the automation infrastructure, processes, interfaces and individual bots

4. **Develop** the bots

5. **Debug** the system – bots, infrastructure and legacy systems

6. **Deploy** and monitor the resulting automation

Each of the major RPA platform suppliers' products are compatible with the 6D life cycle.

TechVision Research fully expects RPA to be ubiquitous in Fortune 1000 companies – the company that cannot benefit from deploying this technology is quite rare. We fully expect a deeper integration of RPA technology with machine learning and AI platforms.

We also advise clients that most RPA programs quickly become a holistic effort, involving multiple business divisions and functions, IT, and key technology service providers. It is also holistic in the sense that ongoing governance and value tracking are more important than in many technology initiatives.

Introduction and Basic Concepts

At first glance Robotics Process Automation (RPA) is confusing – all software automates some task or activity, so what's different about RPA? Haven't we been doing this all along? Given that, it's easy to relegate RPA to "the latest buzzword" status and discount its potential value to your company. But in doing that you would be missing a big opportunity.

It's true that all software performs some kind of automation. What's unique about RPA is that it automates a specific type of task involving human interaction with computing systems. RPA emulates the human at the keyboard, doing his or her daily repetitive work. That's actually the easiest way to think about RPA and what makes it unique – it is a software platform designed to be a virtual employee. Almost anything a person can do in front of a computer – interact with a spreadsheet, read or send email, interact with a custom application, retrieve or store data and files, extract a specific value from a file or a screen – RPA can do, and typically do it better, faster and cheaper. For

RPA is a software platform designed to be a virtual employee.

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once you don't have to pick any two.

RPA works by describing a task in terms of a flowchart or script, and then commissioning a licensed software robot (a "bot", in AI and RPA terms) to perform that task, interacting with your systems and data. The task description and bot assignment are done via an RPA platform, a software suite designed for this precise kind of automation. Once human designers and analysts are comfortable that the bot performs the task as designed, the bot can be scheduled to run on any frequency or continuously. Over time a bot workforce develops and is managed somewhat like their human counterparts.

As with any technical specialty, there are terms used by RPA suppliers and experts that may need some explaining. To that end, here are some common terms used in RPA programs:

- **Bot** – a software robot designed to take pre-programmed actions within a company's computing systems. A bot typically mimics the interaction of a human with corporate computing systems and data, though a bot can also provide machine-to-machine interactions.

- **Platform** – the software control system that creates, monitors and manages the bots. The platform will have features in all phases of the automation life cycle, from development to operations. Bots created on one platform are not compatible with other control platforms.

- **Task or process** – the flowchart of actions that are being automated

- **Digital labor** – the collection of bots performing tasks previously performed by employees or contractors.

- **Multiskill** – for the major suppliers of RPA platforms, each bot is a licensed container that can be filled with multiple programs or "skills". A bot that performs more than one skill may or may not require multiple licenses.

- **Unattended bot** – a bot that initiates and completes without human intervention, triggered by an event or a schedule. An attended bot is one that automates only part of a workflow and typically serves information to a human or performs a transaction in that same workflow.

- **Orchestrator or orchestration** – a feature of leading RPA platforms that allows coordinated, scheduled, operations of a collect ion of bots.

- **High-density robotics** – the ability to run several robots simultaneously on a single virtual machine.

- **Robot-as-a-service (RaaS)** – an end-to-end solution providing users with the benefits of RPA without having to handle deployment, maintenance, and operational control.

RPA Benefits

RPA has a surprisingly rich set of benefits available to businesses that make full use of the

technology. The typical benefit from any type of automation, and this is certainly the case with RPA, is cost reduction. But it isn't just about savings – other benefits may be more important to a particular use case or line of business. These benefits include:

- **Improved quality** – as a rule, bots don't make mistakes. They do what they are programmed to do, no more and no less. By taking people out of a repetitive process, the opportunities for mistakes are driven to near zero. (Of course, mistakes can and do occur if the workflow or bot logic is flawed during the design phase.)

- **Time to service (time to value)** – bots generally work faster than humans interacting with a computer, and bots can work 24x7.

- **Transactional capacity** – scaling up a manual task involving human operators can be expensive and time consuming. But a bot can be taught (programmed) to perform a complex online task, and then any number of bots can be directed at the task with a very predictable and reversible cost.

- **Cost efficiencies** – this is of course a primary benefit of automation in general, and RPA is no different. Bot labor can be significantly less costly than human labor, both in absolute terms (cost per hour or per unit of work) and in overall labor risk. McKinsey cites an ROI range for RPA investments of 30-200%.

- **Improved technical compliance** – this is a special case of improved quality / fewer or no mistakes. Any detail-oriented technical task in a regulatory-sensitive process is a great candidate for RPA. SOX, HIPPA, NERC-CIP, GDPR and other technical compliance processes are all potential benefits sources for an RPA program.

- **Opportunity for rich IT-business partnership** – RPA programs are a natural collaboration opportunity for IT and business leaders. Neither can truly succeed in the endeavor alone – business operations need IT for integration and reliable operations, and IT needs the business for the task and process knowledge. And for benefits recovery.

Early RPA Use Cases and Patterns

One of the reasons RPA has become a hot topic in enterprise IT is that the technique has broad and almost ubiquitous applications. Every company we've talked with has been surprised at the sheer number of automation opportunities in their business processes.

At the simplest level, *any repetitive task* involving a human and computer can be automated via RPA. For any F1000 company, this is a huge opportunity list – typically tens of thousands of roles and tasks. The trick is in selecting the tasks that have the highest benefits for the organization, where benefits again can be cost, time to service, compliance, quality and business capacity.

In general, the profile of a task or process that is ripe for RPA-style automation is:

- A work process that can be fully flowcharted or scripted

- Decision points that can be quantized; need no on-the-fly human judgement or interpretation

- The fewer decision points the better

- Large numbers of records or transaction to process

- Many or multiple iterations of the task – e.g. something done every day

- Many people performing the same task

The task need not have all these qualities, but the more of them present, the better the opportunity for RPA benefits.

Here are some generic examples of tasks that are a good fit for RPA:

- A report constructed weekly from multiple data sources. The employee(s) collect data from transactional systems and spreadsheets, restructure or reformat that data, place it into a new report, then distribute that report to a predefined email distribution list.

- Error queue handling from a legacy system. Often, errors are kicked out of transactional systems into a queue directed at employees who examine the contents and make decisions about its disposition. When those decision criteria can be mapped into a flowchart, RPA can be used to automate that error handling process.

- A regulation or company standard requires that access to systems hosting sensitive data be monitored and documented daily. Any departure from this carries a hefty fine. A bot can check the person-to-system access logs daily or hourly and produce the required documentation, as well as trigger a follow-up when any threshold is reached.

- Onboarding or offboarding employees involves a detailed checklist of actions that need to be taken quickly and reliably. Many companies have found these actions difficult to execute. Bots can be triggered to execute the detailed tasks (e.g. granting or revoking access to key systems, updating employee status in HR and financial systems, notifying ancillary systems or status changes) with little or no human intervention, and produce a complete auditable record of their actions.

The RPA Life Cycle

Given the investment and focus on RPA we now have many versions of the RPA life cycle and it's easy to be confused by the slight differences. But in reality, the life cycle for RPA is very familiar to IT professionals, mirroring the software design, development and operations life cycle. At the highest level it's simply:

- Define the scope, schedule, constraints, goals, risks and budget for automation program

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- Select technologies, internal resources and external partners

- Analyze and prioritize the automation opportunities

- Define the in-program and ongoing operations governance processes

- Work through the life cycle once at small scale, via a pilot or proof of concept

- After fine tuning your approach, scale up and automate many processes

TechVision is elevating the RPA life cycle using our 6D model. We're representing this simple life cycle in figure 1. Each of the 6D steps are explained in this section.

6D – A General RPA Life Cycle
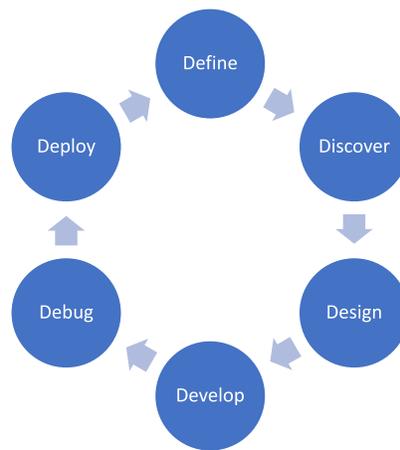
Figure 1 – the RPA lifecycle

Define should be your first step in any RPA program, or for an iteration of a program. The major components that need definition are:

- Your program's scope, schedule, goals and constraints

- Your high-level governance approach – centralized, decentralized or hybrid

- Your funding strategy

- Your technology architecture standards

- The internal organizations and external partners who need to be involved

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Once you've defined the key elements of your RPA program, it's time to **Discover** your opportunities for benefits, your requirements and constraints, and what might be going on in your company. The Discover stage main focuses are:

- Your automation opportunities

- Other already-begun automation activities

- Your process documentation (or lack of)

- The requirements and constraints for each process automation

- Your integration needs and constraints

- Select an RPA technology platform

- Run a proof of concept project to gain insights via hands-on experience

Design for an RPA initiative will be quite familiar to IT professionals. Design targets are likely to include processes, the bots themselves, support and operations processes, and security and compliance controls. Due to leading RPA platforms requiring only minimal software development skills, bot design may be the least of this phase's tasks. The major design stage focuses are:

- Your initial process automation use cases

- Your detailed governance structure and metrics, including who decides which processes to automate, and where the resultant benefits will accrue

- Your operations plan and metrics

- Your bot licensing and capacity management strategy

- Disaster recovery and business continuity plans

- Compliance and audit controls

Develop will also be a familiar stage for IT professionals. There will be a greater emphasis on process design or modification than in typical software projects, so be ready for that. Most companies are choosing to hire a firm experienced in bot design and development for their first foray into RPA, though some are bringing that activity back into house as their comfort with RPA platforms grows. The Develop activities include focuses on:

- Your first group or wave of bots and interfaces

- Your operations monitoring and control systems and processes

- The impacts on core IT operations processes, e.g. Change and Identity/Access Management

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- Your benefits tracking platform

Debug is be a crucial phase to any company using a repeatable software development life cycle. Your normal software test and QA teams – internal or externally sourced – should have no problem adapting their methods to RPA. The Debug phase involves:

- Getting final approval of your "go to production" requirements and checklists
- Populate test suites with data representative of real-world operations
- Test and debug your systems via an iterative test and acceptance
- Test both bot functions <u>and</u> bot operations processes (e.g. incident response, bot scheduling, access controls, provisioning and deprovisioning)

Deploy is the final stage of our 6D RPA life cycle. Moving bots into production is very much like moving any other software system into production. This stage focuses on:

- Transitioning the first group of bots into production
- Monitor and improve; fine tune the operating processes
- Move subsequent groups of bots into production; watch for unforeseen scheduling effects of having multiple bots in operation
- Integrate bot scheduling with business and IT needs

This 6D process for RPA is applicable to any enterprise's automation program. You may need to add steps to a phase for your individual situation and constraints.

RPA Program Governance

As mentioned in the previous section, *governance* is one of the characteristics to be dealt with in the Define phase. We think RPA program governance is important enough to merit a special focus in this report.

RPA governance is important for two key reasons:

1. Governance is likely to be the single most important factor in the success or failure of your automation initiative – not technology, not people, not your consulting partners.

2. Large-scale or broadly-applied RPA is an unusual technology initiative, in that neither a line of business nor IT can accomplish it alone – it must be a deep and ongoing collaboration between IT and the line(s) of business. And that collaboration requires a more

thoughtful governance approach.

To illustrate the importance of RPA governance, it helps to consider the types of decisions that the governance function will have to make. These include:

- How will we measure and report benefits of automation?

- How and where will those net benefits accrue?

- Will benefits accruing from business function automation be used to fund further automation, within or beyond a single line of business?

- How will we describe and define a viable use case? What level of benefit is material enough to warrant an investment in automation?

- Who decides what use cases are automated first? And why?

- Who is responsible for ongoing operations of new business function automation?

- How will large-scale automation be presented to a workforce that may be hostile to the idea?

- What technology standards must be adhered to in the automation initiative? What new standards will be introduced?

- How will we keep the bot versions in synch with changes in applications and infrastructure?

It should be clear that these decisions go well beyond the typical application or infrastructure initiatives that IT traditionally leads. And that neither a line of business nor IT are well-suited to making those decisions alone – hence our assertion that a strong and ongoing collaboration is the only way to be successful.

There are three logical models for governance of any cross-business unit technology initiative, and RPA is no different. Those models are:

1. Centralized governance

2. Decentralized governance

3. Hybrid governance

Centralized is the model in which one organization takes responsibility for the entire RPA life cycle for the enterprise, from definition to deployment. That organization could be an internal line

of business, could be IT, or could be an outside service provider. In each case the centralized group would engage business units individually and automate processes as appropriate.

Decentralized governance is the model in which each individual line of business takes responsibility for the automation initiative and the RPA life cycle, making independent decisions about approach, priorities, standards.

Hybrid governance is one in which a new (typically small) group is chartered to set course and establish standards for the entire enterprise, but the majority of the RPA life cycle is delegated to individual lines of business. In this model the central group – often called a center of excellence – is charged with the Define and Discover portions of the RPA life cycle. The remaining phases of Design, Develop, Debug and Deploy are the responsibility of a business unit with a process to automate. The center of excellence can be populated by a few dedicated FTEs and many part-time or on-loan experts from business units.

In TechVision Research's experience, the hybrid model is the most advantageous and is our recommended approach to RPA governance. This is not to say that the other approaches cannot work – in fact we often see organizations that start their automation journey as decentralized and have some localized success but evolve to hybrid once senior management observes that economies of scale are possible. Our overarching recommendation to our clients is that they spend extra time considering governance in the Define phase of an RPA initiative, and that time investment will pay off many times over downstream.

Leading RPA Tools and Products

As of Q1 2019, there are only three RPA platforms that we would consider for general purpose, enterprise-scale automation - Blue Prism, Automation Anywhere, and UIPath. While there are many other products supporting RPA functions, these are the three that are most likely to meet the general needs of Fortune 1000 companies. In this section we provide a brief summary of each product/platform and a summary table comparing the three.

Blue Prism was the only supplier that agreed to an interview with us, so our comparison has somewhat more information available about Blue Prism.

Blue Prism

Blue Prism (https://www.blueprism.com) is a publicly-held company founded in 2001. It is traded on the London Exchange, and detailed information about its finances, leadership and operations can be found at https://www.londonstockexchange.com/ . The company reports £24.5M (UK pounds) in 2017 revenues and has a market cap of approximately £911M.

Blue Prism is a pioneer and leader in the RPA space, having coined the original "robotics process automation" term. Like all three of the leading RPA platforms, Blue Prism allows professionals with no software engineering expertise to model a process or workflow with graphical tools and create a bot from that model. Blue Prism is an advocate of the flowchart paradigm for representing a process, as opposed to other platforms that use a scripting paradigm.

Blue Prism's high-level distinctions include:

- Scalability
- Legacy system integration
- Error handling
- Blue Prism Digital Exchange (DX), a solutions marketplace
- Certified reference architectures for major IaaS providers (Google, Amazon, Microsoft and IBM)

Automation Anywhere

Automation Anywhere is a private company, founded in San Jose CA in 2003. The company's finances and operating metrics are not publicly available. Automation Anywhere's headquarters are in San Jose CA, and they employ approximately 1400 people worldwide.

Automation Anywhere's high-level distinctions include:

- Ease of use

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- Source and version control

UIPath

UIPath is a private company, founded in 2005. The company's finances and operating metrics are not publicly available. UIPath's headquarters are in New York City, and they employ approximately 2000 people worldwide. Major operating locations are NYC, London, Paris and Bucharest.

UIPath's high-level distinctions include:

- An effective keystroke recorder

- A third-party marketplace for prebuilt bots, interfaces and displays

- Strong OCR support features

While each of these three technology firms have evolving feature differences and advantages, we should reiterate that our opinion is that any one of the three can be the technology foundation for a successful RPA program. This is consistent with our observation earlier in this report that *governance* is likely to be the single most important factor in a large-scale automation initiative.

The following table summarizes these vendors' capabilities and business models.

	Blue Prism	Automation Anywhere	UIPath
Company Description	Public, London Exchange Founded 2001 HQ in England Coined the term "RPA"	Privately held Founded 2003, San Jose CA HQ in San Jose CA Approx. 1400 employees	Privately held Founded 2005 HQ in NYC, NY Approx. 1880 employees
Bot Development Model	No programming language required – flowchart process modelling user interface XML code generated from flowchart	No programming languages required - uses outline to represent workflows, tasks and decisions	No programming required - drag and drop workflow diagrams model the process steps Human keystroke inputs can be recorded as a workflow and replayed as the core of a new bot.
Software architecture	Client: Windows	Client: Windows	Client: Windows

	Blue Prism	Automation Anywhere	UIPath
	Infrastructure: .NET	Infrastructure: .NET	Infrastructure: .NET
Interface Model	Variety of APIs including SOAP or REST via Blue Prism's Design Studio module.	Variety of APIs including SOAP or REST registered in AA's Control Room module.	Variety of APIs including SOAP or REST via UIPath's Orchestrator or Studio modules.
Software License	License cost based on maximum concurrent bots in operation. A licensed bot is reusable – any bot can execute any task or workflow at any time, subject to max concurrent bots. Enterprise license available.	License cost based on number of bots and individual module licenses Cost per bot negotiable by custom quote. Enterprise license available.	License cost based on number of bots, with different bot types (e.g. attended, unattended, development) Cost per bot negotiable by custom quote. Enterprise license available.
Software Maintenance	Standard maintenance included with license, includes security updates Enhanced (enterprise) maintenance available for 12.5-15% of initial license fee (paid annually)	Maintenance details available via quote from Automation Anywhere.	Maintenance details available via quote from UIPath.

TABLE 1 – Comparison of leading RPA platform suppliers

Future State of RPA

Many large enterprises are at the early stages of designing and implementing RPA programs. That coupled with the immense visibility and investments in this space are resulting in a challenge to

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determine where RPA is going over the next 3-5 years.

Some RPA predictions:

That said, here is our view of where the technology is going.

- RPA, machine learning and AI will merge into increasingly powerful operations and analytics tools. RPA platforms with well-integrated AI and analytics functions will prevail.

- A majority of IT operations tasks currently done by people will be performed via RPA by 2022.

- Within F1000 companies, RPA will become as ubiquitous as relational databases over the next decade.

- Sophisticated capacity, access management and workflow management tools will become crucial to companies deploying RPA. The more bots, the more crucial core IT operating management becomes.

- Routine compliance, privacy and access management processes associated with enterprise data stores have been poorly realized via human administrators and "data owners". Bots will fill this gap reliably.

- While the top 3-5 leading RPA platforms are relatively new players in enterprise technology, older incumbents (e.g. SAP, Salesforce, Oracle) will quickly add RPA-like capabilities to their core offerings. Enterprise architects need to decide if they want to view automation as a pure-play horizontal service, or to use the "native" automation offered by incumbent software OEMs.

Insights and Recommendations for TechVision Clients

Insights

The following list outlines considerations and impacts of an RPA program. Using these observations as part of your RPA planning can help you quantify the organizational changes, costs, and benefits of an RPA implementation.

1. Program-level, cross business unit *governance* is the single most important element for RPA success. Neither IT nor business leadership alone can implement RPA and realize full benefits.

2. There are currently only a few real choices in general-purpose RPA technology platforms working at enterprise scale – Automation Anywhere, UIPath and Blue Prism.

3. Up-front inventory and categorization of automation opportunities is your program's foundation. It establishes a goal for savings and sets expectations.

4. RPA is one of those rare situations where you really can do things better, cheaper and faster. You don't have to pick just two.

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5. While the business case may be made on human labor hours saved, the case for RPA is much richer. RPA can improve quality of work, speed of service, increase compliance to standards.

6. 20% human labor savings across a portfolio of automation opportunities is a reasonable goal. For example, if you identify 100,000 annual employee or contractor labor hours in a set of processes, saving 20,000 hours annually is a practical goal.

7. The RPA life cycle is simple, with six major stages – define, discover, design, develop, debug and deploy.

8. RPA and DevOps tools have very similar effects on core IT operations – they put significant new pressures on core IT processes such as change management, capacity management, identity and access management. The reasons for this are not entirely obvious.

   Consider the scenario where the bots generated and managed via your RPA platform need to acquire credentials to access systems and data (pretty much a universal scenario for RPA). Doing it right the first time is relatively simple and integrating the bot operation with an IAM (identity and access management) or PAM (privileged access management) platform is also straightforward. But what happens if (when) the bot code changes? The IAM or PAM service typically has no way to know what the change is – from their point of view the bot ID is the same and access is granted.

   But what if the change in bot code is flawed or malicious? A bad actor could insert code into the bot's process that exfiltrates data and access credentials as part of the bot's newly-edited operation. The IAM and PAM services have no way of detecting this new and unpleasant process step. And the fact that bot coding is now potentially controlled by agencies outside of core IT, the opportunity for malicious action is even greater.

   The simplest way to address this risk is to make sure that the credential-providing service can detect changes in bot code relative to the original version. Not all IAM and PAM providers can do this.

9. Capacity Management and job scheduling become crucial IT operating processes, even if they were not previously. Some RPA license models charge based upon the number of concurrent bots, so paying attention to capacity and concurrency can pay off in hard savings. Further, bots can stress IT infrastructure and system responsiveness by working much more rapidly and continuously than the humans they emulate. These stress-on-capacity effects will typically show up during month-end or year-end processing, exactly when they are most damaging.

10. If your organization has trouble provisioning and deprovisioning human access to corporate systems, an RPA program will really highlight that difficulty. RPA will typically show great value for the organization, so the tendency will be to invest more and more until you have a virtual "army of bots" with complex scheduling and reuse. Each instance of a

bot's creation, authorization provisioning and deprovisioning needs to be done on demand, automatically, quickly and reliably. While an organization may be able to wait hours or days for human access provisioning, that simply will not work for RPA.

11. While bots typically execute their tasks much faster than their human counterparts, they are still 2-3 orders of magnitude slower than native code performing the same task. If extreme performance or capacity requirements are the problem(s) you're trying to solve, custom code may be the better approach.

12. The RPA life cycle lends itself very well to agile methods in design and implementation. In fact, an effective RPA program needs iterative passes.

13. Interestingly, from an IT perspective, RPA bots share many characteristics with their human counterparts. They need to be onboarded/offboarded, granted controlled access to systems, monitored (managed), scheduled, and ultimately retrained (reprogrammed). From this perspective, stakeholders such as HR, security and operations management will be involved even if their processes are not being automated.

Recommendations

As you start your journey towards RPA, you'll need to pay close attention to the areas. By caring for these early, you'll significantly increase the odds of success of the efforts.

1. **Get your cybersecurity experts involved in your RPA work early.** While RPA-style automation can reduce a lot of risk, the new software can also introduce new vulnerabilities.

2. Bot and RPA platform licensing is a bit more complicated than one would expect. **Examine the licensing model of your preferred RPA platform and model it for a successful, scaled-up implementation.** Ask to speak with clients who have experience with any complex licensing model.

3. If business and IT are already collaborating on an RPA program, great. If you're part of a line of business proceeding somewhat independently of IT, that can certainly work, but be sure to consider the production operations considerations, including ITIL (IT Infrastructure Library) processes, compliance and security requirements. **Focus specifically on your organization's formal Change, Capacity, Identity and Access, Privileged Access and Revision Control processes.**

4. **Ask your IAM and PAM product or service provider if they can detect changes in a bot during a request for credentials.** If they cannot, consult with enterprise architects and security on that new risk.

5. **Gaining assistance from an experienced RPA developer and operator is highly recommended.** In particular, RPA operations have economies of scale that only an established operator can offer. Your in-house IT group is unlikely to be able to operate and

RPA infrastructure at scale as efficiently as an experienced externally sourced operator.

6. Understand that many organizations may get pushback from the perceived and sometimes real potential for loss of jobs. **Consult with your HR and labor relations experts early in your program.** Education, cross-training and good early communication are keys to mitigating some of these challenges. These challenges can be particularly difficult in organizations with powerful unions.

7. **Enterprise architects need to consider whether they want to view automation as a pure-play horizontal service** (e.g one of the leading RPA platforms), or to use the "native" automation offered by incumbent software OEMs, e.g. SAP, Oracle and Salesforce, and more focused automation platforms like Pegasystems.

8. Spend extra time and thoughtful consideration in the Define phase of your program and **focus that extra effort on governance**.

Conclusions

As of Q1 2019, RPA is a proven, mature technology useful for automating a myriad of tasks common in Fortune 1000 companies. The cost of entry and implementation complexities are minimal compared to the potential benefit. We at TechVision Research believe the Fortune 1000 company that cannot benefit from RPA investments is quite rare, and that our clients who have not begun deploying this technology should do the business case analysis and (quite likely) begin deployment.

That being said, any company deploying significant new automation – whether RPA or DevOps – needs to review and likely strengthen core ITIL processes and the governance of bots and data access. Change management, identity management, access management and version controls all need to be "rock solid", or the automation can cause significant operations problems not too far downstream.

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About TechVision

World-class research requires world-class consulting analysts and our team is just that. Gaining value from research also means having access to research. All TechVision Research licenses are enterprise licenses; this means everyone that needs access to content can have access to content. We know major technology initiatives involve many different skill sets across an organization and limiting content to a few can compromise the effectiveness of the team and the success of the initiative. Our research leverages our team's in-depth knowledge as well as their real-world consulting experience. We combine great analyst skills with real world client experiences to provide a deep and balanced perspective.

TechVision Consulting builds off our research with specific projects to help organizations better understand, architect, select, build, and deploy infrastructure technologies. Our well-rounded experience and strong analytical skills help us separate the "hype" from the reality. This provides organizations with a deeper understanding of the full scope of vendor capabilities, product life cycles, and a basis for making more informed decisions. We also support vendors in areas such as product and strategy reviews and assessments, requirement analysis, target market assessment, technology trend analysis, go-to-market plan assessment, and gap analysis.

TechVision Updates will provide regular updates on the latest developments with respect to the issues addressed in this report.

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About the Authors

Jeff Nichols has spent over 30 years as an executive, technologist, consultant and thought leader including 10 years in the health care space and 10+ years in the energy industry. He was most recently Director of IT at Sempra Energy leading the company's efforts in networks, "big data", technology infrastructure, compliance, information management, & enterprise architecture. Recent efforts he led include starting an RPA program, a wide-ranging technology transformation program and an application rationalization program. He was formerly Executive Director at Kaiser Permanente after leading a consulting firm focused on IT in the health care industry.

Key areas of focus include AI, RPA, Machine Learning, innovation, IoT solutions, technology strategy & planning, ITIL operations, information security, business analysis, program management and system architecture.

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