

INTELLIGENT AUTOMATION PLAYBOOK

Volume 1: Robotic Process Automation

EMERGING TECHNOLOGY COMMUNITY OF INTEREST

Intelligent Automation Working Group

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Synopsis

The President's Management Agenda, Cross-Agency Priority Goal 6 – Shifting from Low-Value to High-Value Work encourages agencies to adopt emerging technologies such as RPA to automate administrative tasks. RPA offers great potential for the government to cost-effectively reap benefits in the form of efficiency, accuracy, auditability, compliance, reduced process cycle time, and increased satisfaction for both citizens and employees. RPA will help the government to absorb the coming wave of employee retirements and decreased budgets.

This playbook is intended as timely assistance for the many agencies who are considering RPA, running pilots or seeking to accelerate deployment. The goal is to provide in-depth guidance for federal agencies to establish, operate and grow RPA programs, from understanding the capabilities and benefits through preparing the organization, evaluating software, governance, IT, implementation, operation, managing workforce impacts and scaling up.

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The ACT-IAC Emerging Technology Community of Interest (ET COI) mission is to provide an energetic, collaborative consortium comprised of leading practitioners in data science, technology, and research, engaged with industry, academia, and public officials and executives focused on emerging and leading technologies which transform public sector capabilities. The Intelligent Automation working group is part of Emerging Technology COI with goals to help agencies (1) Learn – educate federal agencies on intelligent automation; (2) Assess – help agencies assess problems that can be automated; and (3) Implement – provide a blueprint for full lifecycle implementation.

Disclaimer

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Introduction

On March 20, 2018, the President's Management Agenda (PMA) was unveiled and laid out a framework for agencies to provide improved service to the citizens via IT Modernization, Data Accountability, and Transparency, and developing a Workforce that is better able to keep pace with changes in technology and consumer demand.

A key element of the PMA Cross-Agency Priority (CAP) Goal 6 "*Shifting from Low-Value to High-Value Work*" encourages agencies to adopt emerging technologies such as RPA to automate administrative tasks. RPA offers great potential for the government to cost-effectively reap benefits in the form of efficiency, accuracy, auditability, compliance, reduced process cycle time, and increased satisfaction for both citizens and employees. RPA will help the government to absorb the coming wave of employee retirements and decreased budgets. How can agencies turn that potential into reality?

This playbook is intended as timely assistance for the many agencies who are considering RPA, running pilots or seeking to accelerate deployment. The goal is to provide in depth guidance for federal agencies to establish, operate and grow RPA programs, from understanding the capabilities and benefits through preparing the organization, evaluating software, governance, IT, implementation, operation, managing workforce impacts and scaling up.

Readers should start with the [ACT-IAC Intelligent Automation Primer](#) which provides definitions and overview of key concepts as a foundation to this playbook.

The next section provides an overview of the contents of this playbook to inform and orient the reader on the need, business case, definitions, and an overview of the implementation process. The subsequent sections of this playbook explain the detailed step by step implementation of automation projects.

The Government Automation Imperative

Robotic Process Automation (RPA) offers great potential to help the government maximize efficiencies and increase compliance. To achieve this, agencies must address the governance in the areas of technical, infrastructure, operational, regulatory, and security. Focusing on each of these early in the RPA journey will enable agencies to realize the benefits while maintaining a governance structure that delivers on the promises of RPA.

In support of the PMA, the Office of Management and Budget (OMB) directives paved the way for government adoption of RPA. Among them is OMB Memorandum M-17-26 dated June 17, 2017 "*Reducing the Burden for Federal Agencies by Rescinding and Modifying OMB Memoranda*" which enables agencies to eliminate duplicative or obsolete reporting requirements to reduce costs and minimize staff hours. RPA is regarded as an important technology to enable streamlined reporting procedures.

On August of 2018, OMB published M-18-23 "*Shifting from Low-Value-work to High-Value work*" which emphasizes the need for introducing new technologies such as RPA to reduce repetitive administrative tasks.

Federal CIO, Suzette Kent has embraced intelligent automation technologies that include RPA, Artificial Intelligence, and Machine Learning, among others to promote modernization of information technology across government. At the time of publication of this document, final policy has not been announced. However, it is expected to provide guidance on using RPA, machine learning, and artificial intelligence [1].

In addition, the government must consider a dramatically changing workforce that includes many retiring workers, contrasted with millennials who, on average, stay two years or less in any single job. For agencies to fulfill mission goals, automation is seen as an option to meet the deficit created by an ever-decreasing pool of workers.

The General Services Administration (GSA) has taken the lead in setting up a cross-agency Federal RPA Community of Practice (COP) where agencies can establish best practices and guidance, learn from each other's experience, share lessons learned, and share collateral with the objective of implementing successful RPA projects.

What is RPA?

Computer programmers have been automating processes using scripts, screen scraping, and other techniques since the inception of modern computer programming. RPA is a form of automation that uses simple rules for structured data. RPA tools and techniques are used to automate a series of rules that mimic human interactions with IT systems on a computer or desktop or perform other repetitious processes. Some example processes amenable to RPA implementation are:

1. Data entry;
2. Data manipulation (copy, paste, move, calculate) and report creation;
3. Read information from structured documents and fill out forms;
4. Access websites (including social media), extract and process data;
5. Log into systems (including emails and attachments), read and process information from multiple systems; and
6. Run 'if/then' commands

While the term 'bot' is used in relation to RPA, it is software-powered automation and there are no mechanical robotics involved. It is distinguished from Artificial Intelligence and Machine Learning because RPA deals with an automated business process that requires essentially no decision-making capability. When situations occur that require decision making, the RPA typically interacts with a knowledge worker.

Business Case

Organizations are constantly under pressure to do more with fewer resources. Compounding this challenge, aging technology infrastructures must be updated through large scale transformation efforts. While funding these efforts remains a challenge, leveraging the savings from RPA is one way to help fund strategic transformation. Some agencies have realized savings from RPA in the same budget cycle.

RPA helps agencies realize the following benefits:

1. Document and improve processes
2. Automate manual processes

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3. Reduce process cycle times
4. Eliminate human error, resulting in increased accuracy and reduced re-work
5. Increase compliance with federal mandates
6. Improve auditability
7. Increase customer satisfaction by increasing quality and reducing response times
8. Accomplish work not currently done due to resource and time constraints
9. Increase productivity and employee satisfaction by shifting to higher value, more rewarding work
10. Increase the attractiveness of government service to a young, tech-savvy workforce

Many agencies have begun to pilot RPA programs. RPA has delivered on the promise to save time and costs while delivering expected performance gains. When RPA projects are evaluated and implemented carefully, bots can save thousands of manual labor hours annually. Typical RPA pilot programs require an investment for software and services of tens of thousands of dollars rather than hundreds of thousands, and often achieve a payback period of less than one year. Compared with traditional IT initial application development investment, costs per bot are relatively very low.

As an example, IRS Procurement's contracting workforce has shrunk dramatically while workloads increased. They identified an automation use case for contractor 'responsibility determination' which is performed prior to making an award. Using RPA, they were able to reduce a three-hour manual effort to three minutes, freeing up the time of contracting professionals to do more valuable tasks. They estimate that this bot could automate approximately 18,000 labor hours annually [2].

PwC estimates that 45% of workforce tasks can be automated, which could save an estimated \$2 trillion in global workforce costs and enable workers to focus on more meaningful work [3].

Differences From Traditional IT

RPA bots are targeted solutions to automate specific processes and can be implemented in short time frames. Traditional IT development typically has longer duration, with more complexity, and wider scope to solve enterprise problems.

Since RPA mimics a manual process, a traditional business requirements document is not needed. Rather a determination must be made that the existing manual process is optimal and can be automated. Business process improvement goes hand in hand with RPA and helps standardize a process and eliminate variations between multiple practitioners.

Technologists recognize that the RPA tool environments are often referred to as "low code" or "no-code" requiring little programming background except when connecting to system APIs or performing advanced automation tasks. As shown in Figure 1 RPA automates 'hand work.' When RPA is coupled with AI and machine learning techniques to enable some level of reasoning and decision making ('head work') it is referred to as Intelligent Automation. The next volume of this playbook will extend the discussion to Intelligent Automation

RPA can be implemented on a desktop, a virtual desktop (VDI), or an enterprise platform (servers on-premise or in the cloud). RPA can be developed by 'citizen developers' without a technical background but this must be done in accordance with established IT procedures for code version control and

security. For example, separate environments for development and test, and production are needed, with developers unable to access the production environment and make unauthorized code changes.

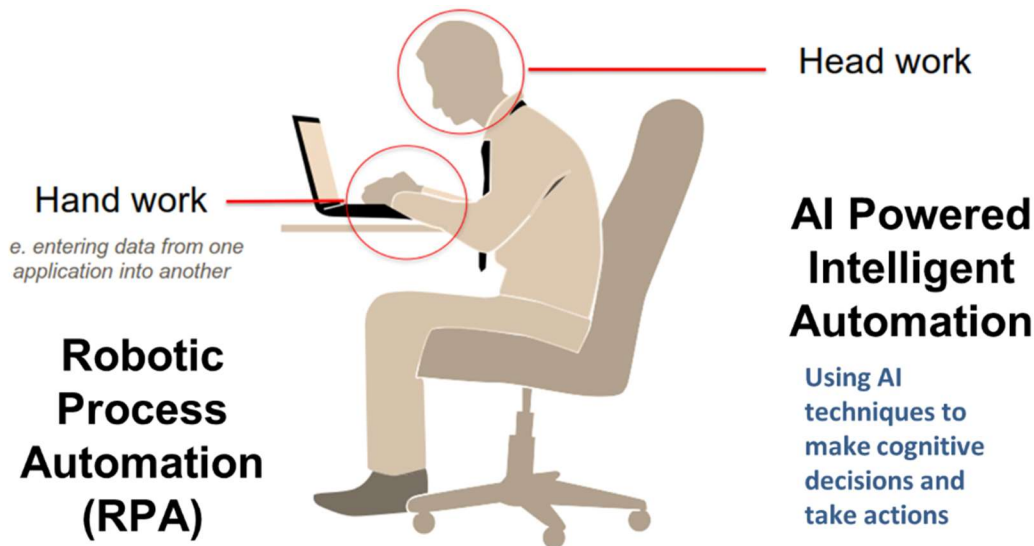


Figure 1: Robotic Process Automation automates hand work. Intelligent Automation combines the automation of hand work and head work (adapted from presentation by WorkFusion)

How RPA Is Implemented and Operated

To get started with RPA, it is important to have a subject matter expert who is familiar with the process to be automated and necessary to have someone who has experience using the selected RPA tool.

The automation may use a person's credentials or have its own credentials, and may be 'attended' (run manually) or 'unattended' (scheduled to run automatically) to perform simple rules-based tasks using structured data such as accessing email and systems, performing calculations, creating documents and reports, and checking files. RPA can play many different roles. For example, GSA uses RPA to process receiving reports for goods and services.

Organizational Readiness and Getting Started

Determining If RPA Is the Right Technology

Before embarking on a RPA program, agencies should perform an assessment of whether RPA is an appropriate solution to some of their problems and challenges.

When considering potential RPA projects, there are several questions one should consider.

1. First, is the process under consideration highly repetitive?
2. Is it subject to human error?
3. Is it difficult to find the staff to do the work?
4. Is it boring or mundane and are workers performing the work often bored by the tasks?
5. Will automating the process (or even parts of it) free up staff for more important work?

6. Will automating deliver a return on investment (faster cycle times, increased throughput, doing more with less)?
7. Will automation result in cost savings or performance improvements?
8. Will automation result in improved customer service?
9. Is the current process rules-based with little or no exception handling or judgement required?
10. Are the tasks under consideration highly repetitive?
11. Do the tasks require human interaction to take data from one system and input one or more other systems?
12. Where are the bottlenecks that could be eliminated or reduced by RPA?

If enough of these questions can be answered in the affirmative, then agencies should start preparing the organization for RPA.

When evaluating potential RPA use cases, other important considerations should include:

1. Will the government need to work with employee unions? The objective is not to eliminate jobs but to make them easier and faster. Have a plan to manage this and understand the union contract.
2. Might it make more sense to automate work done by mid-level, non-union employees who can more easily be retrained and reassigned?
3. Who will provide operations and maintenance support?
4. Has IT been included in the pilot and proof of concept phases?
5. What will the impact be on the workforce? Will workers consider RPA as a benefit to them or a threat to their job?
6. Was IT included in the proof of concept/ pilot phase(s)?
7. What software tools will be used to enable automation? Will the project require support from resources other than subject matter experts, such as IT, legal, or union representation?

Readiness Activities

The purpose of the Readiness Phase is to prepare agencies to successfully design, develop, implement, and adopt RPA solutions. Readiness should be considered and understood before an organization undertakes RPA initiatives. Proper preparation is critical to successfully introduce useful and scalable RPA capability into an organization, help avoid missteps, save resources, and ensure a smooth transition.

The most recent Government Accountability Office (GAO) Strategic Plan identified AI (including RPA) as one of the “five emerging technologies that will potentially transform society” [4]. GSA is taking the lead in supporting government AI evaluation and in recent remarks to Congress, Keith Nakasone, Deputy Assistant Commissioner of GSA Office of Information Technology Category (ITC), identified several steps that need to be taken and processes to be understood before an agency could make RPA a success in government organizations [5]:

1. Contracting vehicles should be put in place that encourage competition and help connect agencies and businesses to allow government to efficiently procure these services.
2. A foundation for data-driven decision-making must be created that would allow piloting of RPA and related technologies to augment the workforce.

3. Citizen-facing programs should be evaluated and put in place that allow participation from both the private and public sectors.
4. A better understanding and alignment of IT modernization in conjunction with the private sector and federal agencies should be developed.

The goal for each agency would be to identify processes where one can:

1. Reduce cost;
2. Improve processes;
3. Increase accuracy; and
4. Redeploy staff to higher-value work.

Readiness activities increase the likelihood of success by providing guidance based on direct RPA delivery experiences, industry best practices, and lessons learned. Assessing your organizational readiness for implementing a disruptive technology such as RPA will identify gaps that could slow or derail your service delivery improvements, hinder workforce adoption, and result in increased costs or schedule delays.

RPA Approach and Start-up Investments

Most organizations use an iterative RPA implementation approach to demonstrate the reduction of manual administrative tasks, increase the quality of service, reduce risk, and improve mission and operations success. This approach supports identification, justification, and acquisition of RPA proof of concept (POC) start-up investments prior to seeking funding for larger RPA programs.

An iterative approach includes two or three stages of automation, where each stage builds on the successes and lessons learned. These automation stages are supported by tasks that ensure RPA works within the organizational and technology environment, changes are documented and managed, and workforce adoption is supported.

Common RPA automation stages are:

1. **RPA Proof of Concept** - Designed to test and demonstrate RPA as an operationally feasible, usable, and effective solution for users.
2. **RPA Pilot, Prototype, or Minimum Viable Product (MVP)** – Designed to deliver limited but essential and valuable features quickly to users in the production environment.
3. **Expand and/or Create New RPA Implementations** – Designed to deliver features to users in a production environment using a repeatable, documented automation and implementation process.

Expectations for initial software investments are low compared to typical IT development and are commonly regarded as well under \$100,000 for one bot and the associated audit controls capability. Corresponding services will vary depending on the complexity of the process.

Simpler bots can be developed by ‘citizen developers.’ However, more complicated bots that involve using system APIs, database access, etc. quickly make the automation process more complicated. Agencies would be wise to tap into contractor resources to help them on this journey including Business Process Re-engineering to improve the processes being automated.

Preparing the Organization for RPA

There are two main considerations for an agency as preparation for RPA – preparing the workforce and selecting a use case that will provide a significant return on investment. Agencies that are successfully implementing RPA often found a ‘no brainer’ for the first use case to demonstrate the benefits to the workforce. Enthusiasm often takes over as workers realize that RPA offers tangible benefits to them directly, therefore, additional use case ideas emerge organically.

Given the ongoing challenges to the Federal workforce in that there are fewer workers than there are jobs, agencies must endeavor to communicate that RPA is not intended to replace the worker, only to remove the repetitive, boring and/or mundane aspects of their job. It is recommended that the Human Resources organization be involved to develop proper messaging and timing of the messaging to avoid any distrust of RPA programs. Messaging should begin at the time RPA projects are initiated.

How to Get Started

When initiating a RPA project, it is important to consider the words of Stephen Covey, “Start with the end in mind.” [6] Robotic Process Automation (RPA) can provide dramatic improvements in how highly repetitive tasks are completed and are an important first step for organizations that see a long-term use of Intelligent Automation (RPA, Artificial Intelligence, Machine Learning, etc.) for their department and agencies. It is important to keep longer-term goals in mind as you implement the first automation projects. Eventually, automation projects will likely interact with one another and will require some level of strategic oversight to avoid conflict and keep the agency on track with strategic and mission goals.

The important thing is to get started. Find a use case that meets the criteria outlined above, select an RPA software that has the flexibility and scalability you will need long term and get started with a Proof of Concept. This initial case can be a process involving one employee or a process spread across multiple employees. You will learn valuable lessons you will not get from the planning stage. Start with a proof of concept that interfaces with the database(s) and network(s) you will need at full deployment. Be sure to include how the bot will function within agency requirements for security, access control, and audit demands. Next, a Pilot Program will make sense to get the bugs ironed out and build confidence before full production roll-out. Once your first project is declared successful, you can take the lessons learned into subsequent builds. As more than one RPA development team is established, it will be time to establish a Center of Excellence

Analyzing Potential Use Cases

Once a list of possible RPA use cases has been established, Figure 2 below explains how to rate and evaluate what to automate first, second, etc. by identifying projects that fall into four quadrants defined by the levels of business value and complexity (high and low for each). Each use case should be assigned to the appropriate quadrant. Quadrant 1 represents projects that should be done first, and then move on to projects in Quadrants 2 and 3. Ideas that fall into Quadrant 4 should not be done at all.

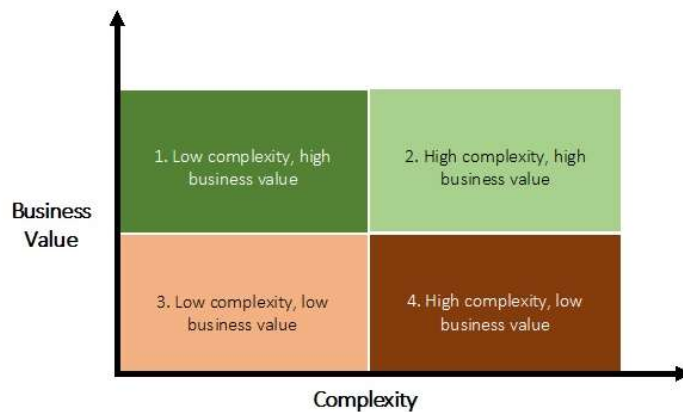


Figure 2: The Business Value versus Complexity quadrant is a great way to evaluate RPA use case ideas and select the ones to try first [7]

Early in the planning phase, it is important to engage with C-level executives to gain buy-in and support. In addition, best practices encourage employee communication and engagement so that employees understand the benefits to their work life so that the fear of technology adoption is not a consideration.

Once you have determined which processes to automate and in what order, you will need to consider the day-to-day operation of the bots, particularly with respect to security and audit requirements.

Operating and Maturing

Governance and Center of Excellence (CoE)

Once an automation has been successfully implemented, several questions arise such as:

1. How do we industrialize RPA to deliver benefits faster?
2. What is a good production support model?
3. What kind of governance model and processes should be established?

The establishment of an effective RPA Center of Excellence (CoE) or Program Management Office (PMO) provides the structural framework for managing the growth of RPA within an enterprise and, most importantly, maintains and accelerates the benefits realized beyond the initial deployment period.

The following elements help define a high performing CoE:

1. **Policies and Standards:** There is a need to establish the policies and standards for bot qualification, development, and deployment to meet audit, regulatory, information security, and compliance requirements.
2. **Technology:** The right automation tools must be selected and maintained, and RPA integrated into IT strategy, service management, change management, and configuration management.
3. **Processes and Procedures:** The complete lifecycle of RPA in the enterprise must be managed. This includes identifying and assessing automation opportunities and managing the delivery lifecycle, including documentation, development, testing, deployment, operations, and support. Deliver consistency through repeatable methodologies and patterns while ensuring continuous improvement.

4. **People, Culture, and Communications:** The human resource impacts of RPA must be managed, including redeployments, reskilling, redefined job descriptions, and even altered organizational structures. The workforce must be educated with constant message reinforcement. Invest in professional development through certification and training to ensure project and performance consistency.
5. **Organization:** What is the organizational structure of the CoE itself? Development of a RACI (Responsible, Accountable, Consulted, Informed) chart helps. The CoE must be fully aligned with the organization's existing functional roles and responsibilities to provide maximum efficiency and integration into existing controls.

These elements define and maintain an organization's RPA Operating Model, which is focused on the development and support of high-quality automations that deliver the intended benefits.

RPA governance includes the offices of the CFO, CIO, Human Resources, and the business organizations whose processes are automated. Executive oversight is necessary to establish a common infrastructure and technical approach and to help business offices manage process selection, prioritization, and implementation. In addition, governance is needed to resolve any intra-departmental conflicts that arise.

Establishing the CoE early in the implementation process will help ensure orderly adoption across mission delivery organizations and accelerate benefits achievement. Implementing support capability early is easier and more effective than dealing with independent, unstructured implementations of multiple tools, policies, and procedures. Also, a decentralized approach may lead to unmet expectations, making a challenging re-launch necessary. Other benefits include avoiding time spent on independent research, leveraging existing contracts, consolidating licensing, and having uniform technical and security implementations.

Benefits of the single support entity include:

1. Establishing a community focused and trained on RPA capabilities;
2. Promoting reuse and common design patterns through collaboration;
3. Building repeatable demonstrations, proof of concepts, or pilots to drive growth;
4. Working directly with developers and business process owners on educating, identifying, and deploying RPA solutions.

GSA has extended some elements of the CoE model by creating a Federal RPA Community of Practice to share information, best practices, automations, and components (an RPA asset library).

Security Requirements

RPA software bots have the potential to deal with significant amount of confidential data, regardless of what kind of organization the technology is deployed within. In automating everyday business processes, software bots process information from various databases within the organization, log into different accounts using supplied passwords, and gain access to all kinds of information about an organization's operations, processes, and employees. Thus, one of the biggest concerns is security. Several regulations (e.g., FISMA [8], HIPAA [9], GDPR [10], ENISA [11], etc.) mandate that the software design reflects a culture in which security is paramount. Within the RPA context, we can categorize security as data security and access security. Data security deals with preventing unauthorized users

from getting hold of the data processed by the robots. Access security deals with preventing unauthorized users from accessing RPA's data processing service (or individual parts of it) and the connected data sources without permission. This will prevent access to confidential data and its manipulation. Software vendors must play a key role in this process to ensure that their software is built on some basic security fundamentals.

EY created a framework that could be used to deploy a digital strategy and address cyber risk during RPA deployment [12].



Figure 3: EY model for digital automation security

Developing appropriate procedures and processes to address each of the above components will enable organizations to minimize security threats. From a software vendor standpoint, certain minimum standards must be met (e.g., full audit logs, encryption, and role-based access control).

Agencies should carefully consider whether the process or task to be automated involves Personally Identifiable Information (PII). Depending on the agency's PII policies, the presence of PII could more extensive review prior to approval of the automation, or the agency may have a policy that prohibits bots from handling PII at all. Agencies may require a Privacy Threshold Assessment (PTA) and, if the assessment identifies PII handling, a Privacy Impact Statement (PIA). The process owner or project manager must be familiar with the agency's RPA-related privacy policies and the implications for the process of approving the bot.

Some form of ATO (Authority to Operate) will be required. Depending on the agency's policy, the ATO will cover one or more of the following: the RPA platform, the system being accessed by the bot, or the bot itself. Two of the most common solutions are:

1. The automation is assigned a PIV card (Personal Identity Verification) or CAC card (Common Access Card). This treats the bot as a human worker. Care must be taken so that only specific individuals have access to the PIV/CAC card and only when the bot will be invoked.
2. An alternative method is to assign only one individual the ability to invoke the robot (which shares its owner's credentials). The process owner or project manager should engage with appropriate security personnel to assure both PII controls and necessary system access controls are designed into each bot.

Production Support

Production support is a function that supports the RPA software and platform currently in use. This function's main objective is to ensure that the application is up and running as expected. The Production Support person or team is responsible for analyzing reported issues and either resolving them or referring them to other IT teams for resolution. This function commonly resides in the CIO organization but can reside within business operations if that is where the automations were developed.

The levels of production support are as follows:

1. **Level 1 Support** – Initial helpdesk that reviews the issues against already scripted solutions or refers it to another IT team;
2. **Level 2 Support** – Technical support for the application or software; and
3. **Level 3 Support** – Work on defects and enhancements, bug fixing, break-fix or software issues. These support personnel have specific, deeper understanding of the product, functions, and dependencies.

Resourcing

Once bots are developed and deployed into production, the developers will move onto other development tasks. Resourcing and creating a separate sustainment team is a good idea to ensure the continuity and success of the program. After the initial success and euphoria from a successful implementation of bots, some 30% of RPA efforts fail primarily because sustainment is not resourced adequately. The sustainment team will ensure that the automations:

1. Continue to run as designed;
2. Are delivering the desired outcomes;
3. Are not impacted by any changes to the environment or other systems; and
4. Are navigating changes to business processes.

Scheduling

Unattended bots are scheduled to run at a time of day, specific days and dates, or in response to an external trigger such as an input file landing in a folder. An assigned sustainer ensures that schedules are being followed and bots executed as designed. This will also ensure that there is no duplication of tasks (bot doing the same thing more than once) which can cause data quality issues.

License Management

Different RPA vendors have different licensing arrangements. An assigned sustainer must keep track of how many bots are licensed, when licenses expire, interface with procurement to ensure licenses are

current and available in enough quantity, resolve licensing issues, and ensure that bots executing key mission functions do not stop because of an expired license.

Monitoring, Metrics and Dashboards

Some RPA products provide out-of-the-box capabilities to monitor the functioning of bots, analytics, reports, and dashboards. For other RPA products, the user must develop their own reporting and dashboards. At a minimum, vendors provide the ability to log the working of bots (writing stats out to a file) which can be used as the basis for reporting. This helps provide a bird's eye view of the program and can be an effective tool to report time and cost savings and sustain executive stakeholder support.

Here are some recommended metrics for RPA:

1. **Labor Hours Automated:** How many labor hours are automated annually? This can be a measure of capacity created, cost savings, or a combination of both.
2. **Speed:** How much time does a process take from start to finish? How much shorter is the automated process time than the previous manual process?
3. **Scale:** What is the increase in the number of task completions within a set timeframe?
4. **Quality:** What is the percentage of error in a set number of task completions? How much did the error rate decrease as a result of the automation? If the bot has been designed correctly, this rate should be zero or nearly zero.

Successful RPA implementation should show clear gains across all these metrics.

Managing Workforce Impacts

The greatest advantage of RPA is helping automate tasks to free up human time for more valuable work, reduce labor cost, or a combination of both. Employees can benefit by doing more rewarding work, but an inadequate understanding of RPA, its benefits, and impacts can create employee anxieties. As with all disruptive technology, management must focus efforts on effective communication to navigate the change and enlist the cooperation of the workforce.

Resistance to change should be expected whenever a disruptive technology is introduced into an organization. Changing organizational culture to embrace change is, therefore, a critical element to acceptance of change. Changing an organization's culture is a process that includes practices for:

1. Encouraging management involvement;
2. Stakeholder participation;
3. Effective communication;
4. Organizational learning; and
5. Customer orientation.

These are the fundamental change management attributes needed to sustain and speed adoption. Table 1 provides a set of actions that will guide your organizational readiness initiative. Specific steps needed to implement the actions should be defined in a Change Management Plan to ensure that they are addressed. However, every action does not have to be taken before starting your RPA journey.

Table 1: Change Management Attributes

In order to ...	Be sure to ...	Because ...
Have senior management support	Talk about the disruption to the norm.	Leadership involves embracing new ways of doing business and building confidence in proposed solutions to its challenges.
Build a good team	Include the right types of people.	Socializers/networkers are the individuals who connect everyone in an informal network.
		Sellers are the individuals who promote the value proposition and provide best practices and lessons learned from predecessors in government and industry.
		Sponsors are the individuals who have leadership positions and have a stake in the success of IA and will champion it.
		Pioneers/early adopters are the individuals who have attempted implementations and can share their experiences.
	Define roles and responsibilities.	Everyone needs to be accountable for results.
	Create collaboration tools.	The team will need easy ways to capture and communicate knowledge across the enterprise and encourage involvement.
Communicate	Invest in detailed planning, analysis, and customer support.	It furthers an understanding of the cultural, political, and technical landscape, and the use of resources where they will have the most results.
	Create a vision and a plan.	The enterprise must know where it is headed and what success should look like.
	Develop and implement a communication plan.	Key for user adoption and stakeholder support.
Integrate with existing processes	Produce communication tools.	Gameboards and other tools help to demonstrate implementations and show the value that they produce.
		Strategic and tactical business planning must be accounted for.
		Enterprise architecture must be considered.
		Capital planning and investment control must be in place.
Get an early win	Project planning and management are crucial.	
	Obtain ideas for process automation from staff and customers.	People will be excited by wins in tangible areas in which they are emotionally invested.
	Respond to a real organizational concern.	Solving a real problem increases user buy-in and acceptance of future automation.
	Work to win advocates in a variety of places.	It builds broad-based support to continue further.
	Keep an open mind to non-linearity.	The adoption of a new idea is not a sequential process.

Communication, training, and workforce alignment efforts are needed to account for the impact that process automation changes have on the workforce. Successful workforce adoption of automation must consider and address how the user will function in the new environment. It is important to assess and communicate the future state operating model, deliver training to staff on how to do their functions in the new model, identify the impact of changes on staff, and communicate these changes to impacted stakeholders.

Workforce adoption activities are supported by the prior section change management activities and may include:

1. Developing user automation strategies; supporting the implementation of adoption strategies and developing automation adoption tips;
2. Developing RPA use case adoption support training for users and IT support staff;
3. Monitoring and assessing the effectiveness of user process automation and adoption activities; and;
4. Identifying improvement opportunities.

Change Management with Systems

RPA bots mimic human interaction with systems. As such, any change to systems such as new versions, upgrades, changes to user interfaces, etc. could stop a bot from fulfilling its functions. A bot can be designed to handle simple and superficial changes to a graphical interface such as a login box or field length. Anything more substantial might cause a bot to throw an exception and stop.

The bot teams should register themselves as an impacted group with the owners of systems. Any upgrades and changes to upstream or downstream target systems should be communicated back to the sustainment team so they can make adequate changes or tweaks to how the bots operate, ensuring continuing function.

Management Controls and Auditability

The organization's operational rules need to be updated to guide the implementation of new capability and tools. Controls that are synchronized with your strategic direction:

1. Create the foundation for lasting cultural change;
2. Illustrate leadership support;
3. Avoid conflicts across the people, process, and technology domains as new services are created; and
4. Enable greater efficiency.

The management controls listed in Table 2 are focused on the key standards, procedures, regulations, management approaches, and processes through which the organization's mission is carried out.

Table 2: Management Controls to Update

To control ...	Be sure to ...	Because ...
Performance	Mirror employee and organizational standards to the desired “to-be” state.	Existing performance requirements must be adjusted to reflect the need for new roles and for managing bots [digital assistants?].
		Goals and annual performance metrics need to be incorporated into your strategic business plan.
		RPA-related training and certification requirements must be defined.
		Employees and managers must be accountable.
		Expectations must be documented and articulated at every organizational level.
Operational Processes	Update guidelines for developing and delivering services using RPA.	Requirements for collaboration around common lines of business are critical to provide the “one customer” experience. Teams must focus on aggregate customer needs rather than individual tasks or processes.
		<p>Mission practices, standards, and templates help:</p> <ul style="list-style-type: none"> • Develop use cases quickly and efficiently • Assess and prioritize candidate tasks/processes for automation • Streamline candidate tasks/processes • Prepare business cases and value metrics • Audit and control documentation • Implement guidelines and oversight <p>IT policies, standards, and templates help:</p> <ul style="list-style-type: none"> • Share process management and IA tool contracts • Technical architecture • Request funding for development, licenses, and sharing of platform costs • IA tool development and configuration • Monitoring and quality control (i.e., bot custodian role) • Platform design, build, test, operation, and capacity management • Platform and orchestration software configuration and configuration management • Security and privacy approvals (ATO process)

Auditability is an area of strength for RPA. The audit trail embedded in RPA, in nearly all cases, will be better than most manual processes. Data, such as what time the bot started and finished processing, where was it run from, what credentials it ran under, or how long it ran, etc. are examples of audit

control information available with RPA. In fact, implementing RPA can be part of a corrective action plan (CAP) for agencies that are seeking remediation for poor audit results.

Implementation Roadmap: From PoC to Large Scale Application

There are several factors which determine the maturity of an organization to successfully implement RPA technology. Evaluating the existing skill, technology, and process strengths and gaps become important to assess their impact on the 'to-be' state. The following factors are important in predicting the success of an automation initiative:

1. Is the business process stable or in flux? Will they get altered during the automation process?
2. What is the organization's appetite for disruptive change?
3. Return on Investment and value measurement. How accurate is this measurement and how does this influence decision-making within the organization?
4. Structure of the organization. Can a team be created to lead the RPA implementation, and will it be effective at disseminating information and continued processes automation?
5. State of the IT systems within the organization. Are these systems amenable to change? Can new technology be adopted easily?
6. Capability to maintain new systems. Does the IT organization have the technical and management structure to maintain the new automated systems?

A successful proof of concept means that an RPA implementation model has been defined, the team has been put together, vendors/partners have been selected, and various frameworks needed are developed and put in place. The next stages are running a pilot, scaling up, scaling out in the organization, and putting the requisite governance in place.

In the pilot stage, the automation is run in a limited production environment for the first time after defining the requirements, putting together a detailed solution design, testing, and developing exception handling procedures. Most importantly, all stakeholders are asked to provide feedback, which will be the basis for final modifications and readiness for scale-up and full production implementation. Also, a process of wider business consultation should be established in this phase, where different areas can come forward with ideas to be built into the program, on what could be automated in their business areas

The scale-up phase provides an opportunity to establish best practices, grow the automation team and its expertise, and identify other processes that could be ready for automation. However, there are several mistakes that need to be avoided in this phase. The enterprise technology team (or the IT department) needs to be a partner in this phase. Ensure that RPA systems are part of IT's worldview and strategy in terms of security, reliability, scalability, continuity, and fault tolerance. Scaling up from piloting requires a formal structure and operating model, centralized control, strong governance, approved business cases, and a long-term roadmap. It involves systematically rolling smaller projects in a wider program and delivering benefits in parallel. RPA at scale is best achieved within a common environment – using common security, risk, and quality standards. Another challenge in this phase is to manage RPA programs continuously. New procedures need to be tested to respond to new complexities. All changes to underlying systems and technology need to be monitored, with changes made accordingly. Finally, the people strategy needs to be in sync with technology implementation.

Failing to do this will, at best, cause delays in training, redeployments, and team development, and at worst, lead to unrest in employees that feel uncertain about their future.

In the scale-out phase, best practices for RPA in the organization have been established. Various frameworks need to be in place (e.g., managing the RPA pipeline demand, disaster recovery and business continuity plans, continuous improvement plans, etc.) The organization should be advertising the benefits of their RPA implementations and promoting RPA as a key performance benefit across all departments.

KPMG has provided an RPA governance framework which consists of six levers constituting a structured RPA implementation and operating model [13]. Part of the framework are the RPA vision (e.g., organizational vision, business drivers) and RPA strategy (e.g., sourcing strategy) which continuously drive evaluation of the levers. The levers act as a framework to help design the proper implementation approach and operating model. These are:

1. Organizational structure and governance;
2. Process delivery and deployment;
3. Technology;
4. Vendor management;
5. Performance and risk management; and
6. People and competencies.

A successful RPA production implementation will depend on addressing all the above levers.

Conclusion: Lessons Learned

RPA implementations can be very successful in providing a significant Return-on-Investment. However, there are several lessons learned that ought to be kept in mind and addressed. Some are highlighted below.

1. **Complete Understanding of the Processes to be Automated.**
Rules-based processes are prime candidates for automation but can pose challenges if not well understood and documented. A process that is almost entirely rules-based but requires just one ambiguous decision may prohibit an RPA implementation from being effective. In addition, data entry processes that touch multiple applications can become increasingly complex to automate if the data format differs between systems. These can be overcome with more advanced RPA tools that use machine learning, but today they are not commonplace.
2. **Functional and Technical Design Documents**
Hosting design sessions is critical to answering key technical questions. This includes mapping out business processes, gathering requirements and information from end-users, collecting information on the frequency of process execution, analyzing how often there are “exceptions to the rule,” and documenting process outputs. Design sessions will also enable proper adherence to timelines and avoid unnecessary re-work.
3. **Change Management**
Some amount of process re-engineering will almost always accompany RPA implementations. Factors such as data inputs required, pre-existing data standardization, number of system

touches, and flexibility in the sequencing of tasks can influence the amount of upfront work required before configuration begins. It is critical to managing the expectations of the project team and clearly communicates the reasons for the process re-design and the actions needed by the project team. Change management is critical throughout the lifecycle of an RPA project to ensure that employees are properly prepared to take on new tasks that come with process re-design and the upcoming robot deployment.

4. **Exception Handling**

The development of a software bot is not finished until complete testing is done to ensure the robot handles exceptions properly. To ensure “robot sustainability,” use activities in the workflow configuration that give the robot instructions on what to do in case of errors or when encountering Condition B instead of Condition A.

5. **Potential of Scale-up and Scale-out**

Processes will evolve as the organization grows and changes. ‘Hardcoding’ information in a robot might not be the wisest thing to do. The bot must be designed to account for scale up and scale out (to other processes). An agile approach is recommended to RPA implementations to re-program the robot each time there is a change or new exception which is introduced into the process.

Once the RPA bots have been developed and deployed into production, they need to be sustained like any other software program. An important part of sustainment is clearly defining who does what when a bot does not work for a variety of reasons - licensing, server issues, network issues, system downtime/ failure being just a few examples. An industry best practice from the Project Management Body of Knowledge (PMBOK) is to use a RACI chart with four columns:

1. Responsible;
2. Accountable;
3. Communicate; and
4. Informed.

The rows are functions to be executed. Each intersecting cell clearly identifies individuals or teams performing those specific functions.

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Appendices

Appendix A: Tool Selection

When it comes to RPA, many organizations are confused about where to start the selection process. This document covers the pitfalls to avoid and what an organization needs to know to select an appropriate RPA tool for their use cases.

Selection Criteria of RPA tools

When it comes to selecting the RPA tool whether be at the department level or at the enterprise level the task of selection can be daunting for various agencies. It becomes the job of an Enterprise Architect to work with various departments within the organization and look at the selection process from various facets. AutomationEdge has created an Evaluation of RPA Tool framework that can jump-start the agency on the right path to decide which product will better serve the agency from the long- and short-term perspective based on the profile of their workforce that agency would like to automate [13].

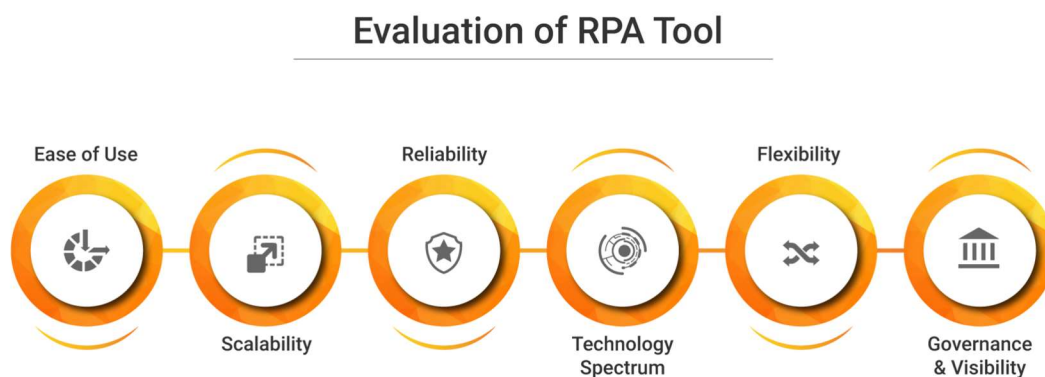


Figure 4: Framework for Evaluation of RPA Tools Designed by AutomationEdge [13]

Ease of Use

When selecting the RPA tool, the evaluator must consider the various actors that will be providing support in RPA implementation. Actors could range from Business Analyst, Developers, Architects, and Operations and Monitoring staff. The automation tool should be easy to work for Business Analysts who have no programming knowledge. They should be able to configure the workflow in the tool without much knowledge of low-level programming. At the same time the tool should be sophisticated enough to allow programmers to work with APIs to interact with other systems easily. So, in a nutshell, a tool that is flexible enough to accommodate basic process automation with built-in extendable commands, wizards and GUIs.

Scalability

Today, IT workloads of most organizations are performed either through data centers, on the cloud, or in a hybrid model. While selecting the tool, the evaluator should not only consider the environment in

which the RPA tool will operate, but also give serious consideration to how the RPA tool and its corresponding bots will scale in the current and future environments. Consideration should be given to the need for a dedicated automation environment or one that can be easily adjusted on-demand through cloud and virtualization services. During the execution phase, one should consider the trade-off between whether bots can be managed by out-of-the-box workflows or they need to be customized to scale them for each task in the ecosystem. Finally, the RPA tool should provide the organization with a path to start small as a POC and later should be able to work well in a cost-efficient way when the organization is ready to scale up at the enterprise level.

Reliability

Although several tools say they can provide the reliability at various service level agreements (SLAs), can the selected RPA tool come close to the complexity and variety of operations managed within an agency? One should check reliability and robustness of the automation framework on which the tool is built and validate if they match the needs of an organization. You should also check the ability of the tool to handle different use cases such as Big Data or integration with different systems, ensuring that performance does not degrade.

Technology Spectrum

The market will provide enough tools that can either serve almost all the possible use cases or the ones that are helping solve specific industry problems. One should consider not paying for unused features (like AI, optical character recognition) if the organization does not have the user case soon. Although all the features may not be applicable from the get-go to the POC, the organization needs to understand the roadmap of the product features that align with the organizations' roadmap and the future use case such that one should be able to get add-ons from the same vendor or at least have access to integration mechanisms. Finally, you should consider the RPA tool's ability to access other systems such as databases, emails, documents, and the web (structured or unstructured data).

Flexibility

It is very important to understand the license structure of the tool on what is in scope and what is not. As an agency starts its RPA journey it is very easy to get cornered by what is covered by the product. It would be in the best interest of the agency to identify potential tool customizations in the early stages (ideally during your tool evaluation stage) and discuss the cost of such customizations and add-ons with the vendor. Alternatively, you can select a tool that allows you to configure custom features without having to pay extra for customization to the vendor. Lastly as we live in a world where workloads are executed in a hybrid environment supported by various operating systems, it would be the best interest to see of the RPA tool that can adapt to the changing environment – giving flexibility to the agency without getting locked to specific Cloud Service Providers (CSP) or an operating system.

Governance and Visibility

Monitoring and control mechanisms should be properly aligned with the agency's security organization early in the process to avoid any mishap with the future use case. A tool should provide visibility to all intended team members with the help of a dashboard. A tool should have a mechanism to notify users of pending actions from users. A tool should provide ROI dashboard for business justification.

Features Provided by Each Vendor

Before highlighting the features of RPA provided by each vendor, it may be good to understand the types of RPA tools available today. These may be categorized as:

1. Automation with spreadsheets and macros. These tools are limited as they are not scalable or sustainable.
2. Programmable bots which require specific inputs.
3. IA bots (aka cognitive bots) provide programmable bots with advanced functionality like Natural Language Processing, image recognition or machine learning.
4. Self-learning tools, which are not commonplace yet, understand and take over processes when they gain a base level of confidence.

A checklist was prepared for RPA vendor assessment:

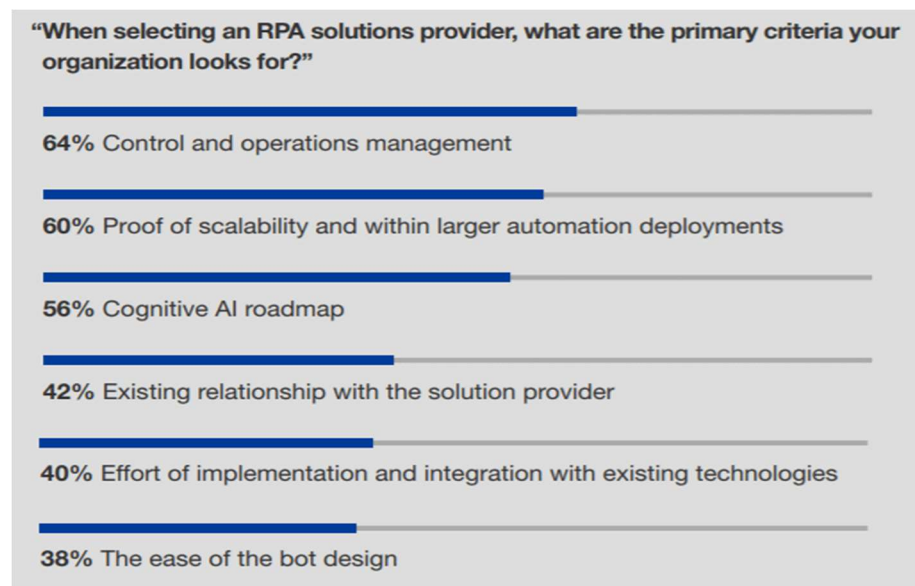


Figure 5: RPA Vendor Comparison Tool Created by AIMultiple [15]

Following are some criteria to consider when selecting a vendor:

- The total cost of ownership
 - Initial setup cost
 - Ongoing vendor license fees
 - Maintenance cost
- Ease of use and control:
 - Ease of automation
 - In-person or virtual training options
 - Ease of control
- Technical criteria including current features and product roadmap:
 - Minimum system requirements
 - Operating system requirements

➤ Hardware requirements

- Security
- Integrations
- Screen scraping capabilities
- Cognitive or intelligent automation capabilities
- Product roadmap
- Vendor experience
- Vendor support
- Existing vendor relationships

Decision Gate

When selecting the tool, one could use a spreadsheet as below and accordingly change the weights based on the needs of the organization (current and future) [16].

	Weight	Automation Anywhere	Blue Prism	EdgeVerve Systems	HelpSystems	Kofax	NICE	NTT-AT	OpenConnect	Pegasystems	UI Path	Example
Current Offering	40%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.03
Bot development/core UI/desktop functions	20%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50
System management and reporting	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
RPA analytics	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Architecture	10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Breadth of usecases/process support	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Governance, security, and service availability	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32
Shared service and scalability	10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32
Strategy	40%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.53
Execution of enterprise RPA Strategy	25%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Partnership ecosystem	35%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Innovation and market approach	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
Product road map and differentiation	25%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50
Market Presence	20%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.68
Enterprise RPA seat/bot sold to date	34%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Enterprise customers	33%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Product revenue	33%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Total Score		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.36

Figure 6: Decision Spreadsheet Created by LeClair to Aid in the Tool Selection Process [16]

This sheet covers the Alternative of Analysis (AoA) and helps agencies compare tools based on three dimensions: Current Offering, Product Strategy, and Market Presence of the tools. When rating specific features of the product one much use a scale of 0 (weak) to 5 (strong) for each category. This template is defined with pre-defined weights for each dimension. Agencies can change the weight of the respective feature based on their needs as one factor may be more important versus the other.

This tool should be used as a guiding document; sound engineering analysis and practices should still prevail.

If your score is 2 or below: A score of 2 or below is the representation of low ROI and limited applicability of the tool within the agency. Although the score may be lower, the agency environment

may still warrant deeper analysis and there could be a compelling reason to continue evaluating the product that did not fall into the standard category.

If your score is between 2 and 4: A score between 2 and 4 could typically be supported with a product strategy but is not a distinct candidate for selection. In this case, the agency would need deep analysis before concluding.

If your score is 4 or higher: A score above 4 typically represents a compelling ROI and stronger application of the product within the agency. It is strongly recommended to consider the cost and benefits of the product and other strategic reasons for the organization to define the selection of the product.

As bots interact with mission systems, they are adding, modifying, or moving data. A sustainer must be responsible for performing quality control checks to ensure the proper functioning of a bot. This can include running queries on a system, checking cumulative totals, trend lines, etc. to ensure that a designed bot is performing as it should.

Appendix B: Ranking of RPA vendors

The information provided below is based on public information available at the time of writing this report. These rankings may change over time and the reader is encouraged to review then current information.

According to a recent Gartner report [17][18], the RPA market grew 63.1% in 2018 to \$846M and is forecast to reach \$1.3B in 2019. Gartner also did an analysis of the top ten vendors ranking them according to their 2018 revenue:

Table 3: Gartner Ranking of RPA Vendors Based on 2017 and 2018 Numbers and Rankings

2017 Rank	2018 Rank	Company	2017 Revenue (\$M)	2018 Revenue (\$M)	2017-2018 Growth (%)	2018 Market Share (%)
5	1	UiPath	15.7	114.8	629.5	13.6
1	2	Automation Anywhere	74.0	108.4	46.5	12.8
3	3	Blue Prism	34.6	71.0	105.0	8.4
2	4	NICE	36.0	61.5	70.6	7.3
4	5	Pegasystems	28.9	41.0	41.9	4.8
8	6	Kofax	10.4	37.0	256.6	4.4
11	7	NTT-AT	4.9	28.5	480.9	3.4
6	8	EdgeVerve Systems	15.7	20.5	30.1	2.4
7	9	OpenConnect	15.2	16.0	5.3	1.9
9	10	HelpSystems	10.2	13.7	34.3	1.6
		Others	273.0	333.8	22.2	39.4
		Total	518.8	846.2	63.1	100.0

Gartner also published its first magic quadrant for the RPA software market. The purpose of Gartner's RPA Magic Quadrant is to inform enterprises of the leading players in the market, which are evaluated on two basic criteria: their ability to execute, and their completeness of vision. A company's ability to execute is defined by things such as its market understanding and strategy, sales strategy, product strategy, business model, level of innovation and geographic strategy. As for its ability to execute, that takes into consideration things such as its actual product capabilities and viability, sales execution, pricing, market responsiveness and customer experiences.



Figure 7: Gartner Magic Quadrant for RPA Vendors (2019)

Similarly, the Forrester Wave for Q2 2018 examined the rapidly maturing RPA market including assessment of vendors driving the advancement of RPA. The evaluation highlights deployment efficiency, scale, training breadth, new ways to look at governance, and advancing analytics.



Figure 8: Forrester Wave Analysis of RPA Vendors (2018)

Appendix C: Sample Statement of Work for RPA services

This section provides an outline of a Statement of Work (SOW) that an agency might issue to potential suppliers of RPA services.

Objectives

Agency consistently targets opportunities to improve manual processes using multiple applications that consume valuable time and resources. Automation of these processes would modernize and streamline tasks allowing staff to focus on more high-value activities. Agency is seeking to improve business process performance by implementing software bots to increase efficiencies, improve service levels, strengthen operational internal controls and risk management, and consistency across processes, integrate disparate systems to improve data flows, and free up resources.

To facilitate meeting the expectations of the project, the Agency is seeking to partner with a company trained and certified on RPA software. The partnership will quickly deliver solutions through a thorough identification and review of business use cases, design and development of software bots for selected processes, transfer bots to production environment and sustainment of production bots.

Agency also requires a partner that can establish cost-efficient governance and sustainment model recommendations. Agency recognizes that RPA is a new solution in the Federal government and as such Agency requires a partner who can provide past performance qualifications that prove the ability to build pilot bots and successfully transfer and sustain those bots in a Federal production environment.

Period of Performance

Provider shall complete the performance of all required services and submit all required deliverables within 6 months after the date of the Contract award.

Place of Performance

Provider shall execute the performance requirements on-site/off-site and will collaborate with Agency personnel via email, phone, teleconferences, and any other electronic means as well as on-site face-to-face to facilitate meeting the performance requirements specified herein.

Personnel Requirements

1. Provider shall provide a project lead for project management activities for the duration of the contract;
2. Provider shall provide a technical/business lead analyst for assessment activities for the duration of the contract;
3. Provider shall provide qualified RPA technical personnel to collaborate with the Agency team for the duration of the contract;
4. Provider shall adhere to the Agency's security requirements during on-site activities;
5. Provider may enable wireless connection in approved areas while on-site;
6. Provider shall not utilize any personnel who are not U.S. Citizens, and all work shall be
7. performed on U.S. soil; and
8. All data shall be stored in the U.S.

Laptop(s) brought on-site will be subject to examination and/or screening by Agency's security organizations. The Provider shall comply with any restrictions/prohibitions relating to the laptop(s)

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brought on-site and the features there-in, as required by the Agency's Security organizations and relevant policies.

Performance Requirements

Provider personnel shall develop the solution both on-site and externally. The RPA software solution shall be installed on servers and network.

The project is divided into multiple project phases: Define & Planning, Development, Deployment, and Closeout.

Define and Planning Phase

1. Participate in an on-site Implementation Planning/Kickoff Meeting within 20 (twenty) business days after contract award in order to receive badges and access to Agency environment
2. Actively participate in the development of a detailed project plan, including phased implementation strategy, project tasks, milestones, and risks
3. Evaluate Agency business use cases for understanding of requirements
4. Document business case requirements including process, resources, and strategy

Development Phase

1. Document as-is and to-be process maps for the selected use cases
2. Develop required software bots
3. Support software robot testing and resolve all issues discovered during testing
4. Complete Development activities as identified by the Implementation plan
5. Conduct Business and IT Training for users, creators and support for each bot
6. Perform a formal software bot handoff process with the Agency personnel
 - The handoff shall walk through the configuration and creation process of each bot with Agency personnel
 - The handoff shall enable Agency personnel to implement and support each bot in the production environment

Deployment Phase

1. Document business case metrics to prove process improvement. Must include the value, ROI, savings based upon success or failure on performance targets
2. Provide documentation for each individual software bot creation process
3. Define strategic and tactical business components as well as the future roadmap
4. Meet with Agency team to present the deployment results
5. Develop and document RPA governance and sustainment model
6. Deliver configuration documentation for each bot

Closeout Phase

1. Prepare feedback for and participate in a Lessons Learned information sharing meeting with Agency
2. Deliver a final presentation to Agency Leadership detailing how RPA met 4 critical success areas: strategic value, financial value, business operational value, and workforce impact
3. Participate in the project closeout meeting with Agency

Operations and Maintenance Phase

1. Put the final strategic model in place (e.g., chargeback mechanisms, creation of RPA center of expertise, etc.)
2. Determine the operating model, governance, and process prioritization system
3. Manage the ongoing change management and communication plan.

Software Requirements

1. RPA software shall be installed, configured and maintained on-premise
2. The system shall be able to use Kerberos Constrained Delegation in order to masquerade as users for Web SSO;
3. The system shall support the deployment on multiple nodes and scale automatically with integration to VMWare APIs;
4. The system shall integrate with LDAP groups for authorizations;
5. The system shall provide UI with control flow tasks and alerting notifications when failures happen; and
6. The system shall have configurable alerting options, such as to notify an owner, or the IT Administrator when failures happen.

Agency Preliminary Use Cases

Preliminary use cases that the agency has identified are described below. We have described the 'As-Is Scenario' for each use case. We have also identified 'To-Be Scenarios' based on our process requirements.

Use Case 1

Use Case 2

Use Case 3 etc.

Deliverables

Table 4: Details of Deliverables by Project Phase

Project Phase	Details of deliverables
Define & Planning	Project plan, other documentation
Development	Working software bots addressing the use cases, testing results
Deployment	Hand over to Agency business leaders, relevant documents explaining deliverables
Closeout	Final presentation to Agency leadership, future roadmaps

Security Requirements

Identify any specific security requirements that may be applicable to the agency.

Abbreviations and Definitions

Provide a list of abbreviations used in the SOW.

Evaluation Factors

Provide details of how the proposal will be evaluated. Criteria might include:

1. Provide innovative suggestions to change and improve the current process (as opposed to automating the specific steps in the current process)
2. Selection and use of a platform that best suits the needs of the agency
3. Ability to implement a solution in an agile manner – tasks with quick turnaround providing a Minimum Viable Product in the least amount of time
4. Support provided after production deployment including help desk availability
5. Managing change requests as and when processes change