Robotic Process Automation (RPA) Tutorial

#RPA20
Meet Your Speakers

Erica Thomas  
OUSD(C) RPA Program Manager

Sri Iyer, Director

Ranyah Salous, Managing Consultant

Rucha Bhide, Consultant

Course Objectives

Upon completion of this training course, you will have met the following learning and hands-on objectives:

- What RPA is and what are its benefits and drawbacks
- How to select and prioritize processes for automation
- How to calculate RPA return on investment
- Who RPA key players are and how they differ
- The future of RPA
What is RPA?

Robotic Process Automation (RPA) refers to software that can easily be programmed to do basic tasks across applications just as human workers do. It operates at the user interface level and can be applied without any impact to existing systems.

RPA can be coupled with AI. In order to differentiate from Artificial Intelligence (AI), think of RPA as “dumb” and used for rule based tasks using structured data while AI, which is “smart”, handles more complicated tasks dealing with unstructured data.

Key Capabilities

- Interacts at the user interface (UI) level in the same way that an everyday user would
- Enables the end-to-end automation of repetitive, rule-based processes
- Works with any application - legacy or upgraded systems
Why are we talking about RPA?

Robotics Process Automation (RPA) mimics the actions that human users would perform on their PC, non-disruptive of existing systems, some solutions require little or no code.

Robots are business rule driven, operate 24/7, sit alongside IT and are governed and controlled by IT.

RPA has also proven itself as a method to reduce outsourcing or offshoring operations, producing uniformly high quality of work while freeing up resources for more strategic work.

RPA can be essential in streamlining back office processes, eliminating paperwork, and reducing the amount of time it takes to process transactions, files, and/or cases.

The Automation Journey

Past
- Rules-based automation within a specific application (e.g., Excel) to automate repeatable processes with structured data

Today
- Automating and reengineering existing business processes by using software, integrating systems, and restructuring labor to optimize workflows and minimize costs

Future
- Automating labor-intensive, repetitive activities across multiple systems and interfaces by training and/or programming third-party software to replicate a user's workflow

Combining RPA with artificial intelligence technologies to identify patterns, learn over time, and optimize workflows

With IPA, robots can replace manual clicks (RPA), interpret text-heavy communications (natural language processing), make rule-based decisions that don't have to be pre-programmed (machine learning), and offer customers suggestions (cognitive agents).
Attended vs. Unattended ‘bots’

Attended Automation
Configure bot to work together with the human

Unattended Automation
Fully automate by teaching the robot how to do it

RPA Demo Overview

#RPA20
Demo

A Race to Clear an Unmatched Disbursement

Benefits of RPA

RPA offers end-to-end automation of repetitive, rule-based processes to shift the workforce from low-value manual work towards high-value analysis.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy &amp; Quality</td>
<td>Reduces human processing errors and rework and increases standardization.</td>
</tr>
<tr>
<td>Compliance</td>
<td>Develops comprehensive audit trail of all process steps.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Performs processes faster than manual processes, and bots can run continuously, 24/7.</td>
</tr>
<tr>
<td>Workforce Engagement</td>
<td>Transfers manual, repetitive processes from the workload of employees to automated bots. This empowers human employees to focus their efforts on more rewarding, creative tasks and analysis to improve mission performance.</td>
</tr>
</tbody>
</table>
### RPA Drawbacks

- Requires electronic data (no physical processes)
- Cannot adapt to system/process changes or fix inefficient processes
- Requires structured data (Excel, standard forms, and webpages)
- Uses limited cognitive capabilities

#### How can these drawbacks be mitigated?

By incorporating some features of Artificial Intelligence & Machine Learning

---

### Process Automation Selection Criteria

#RPA20
Process Automation Candidates

Ideal process candidates have one or more of the following characteristics:

- Multiple sources of structured data input for collation, business reporting & analytics
- Frequent and lengthy cycle time for each process iteration
- Pre-checks and rules validation for new businesses
- Process, when automated, provides justifiable ROI
- Stable application interfaces that aren’t subject to frequent change

Process Score Matrix

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitability Score</td>
<td>Represents how suitable the process is for RPA. Includes metrics such as repetitiveness, data structure, process stability, and process standardization.</td>
</tr>
<tr>
<td>Complexity Score</td>
<td>Represents how complex/difficult the process will be to automate. Includes metrics such as quality of process definition/documentation, quantity of systems accessed, accessibility of systems, data classification, and length of process.</td>
</tr>
<tr>
<td>Value Score</td>
<td>Represents how valuable the RPA solution will be for the process. Includes metrics such as leadership priorities, time spent on process, human error rate, and cycle time reduction.</td>
</tr>
</tbody>
</table>

Process Owners can complete a process questionnaire if they want a process automated.

This questionnaire then feeds into the process score matrix, which evaluates how eligible a candidate is for automation, based on three different scores.
Project Highlights

Developing and standing up a 8-10 FTE RPA Center of Excellence for the Department of Defense focused on developing and promulgating RPA expertise and capabilities throughout the Office of the Secretary of Defense, other Defense Agencies and financial services. Creating an inventory of common automations that can be used across the DoD enterprise on a centralized architecture.

Developed bots using Optical Character Recognition and email integration to reconcile systems of record. Automated processes decrease time required for various reconciliations by 90-99%. Automated processes are auditable and execute tasks with zero errors.

Automated over 50+ processes working with Guidehouse CFO, CIO, and other operations components to analyze, optimize, and automate processes that will lead to decreased workload, better control and oversight of contract execution, improved financial processes, better analytics on IT, and more automated reporting.

Developed a pilot program for the ERO Transportation team to automate contract review and data processing by automating all the steps required to prepare operational data for a Tableau dashboard.

Developed bots using Optical Character Recognition to compare and validate data across various sources and update systems accordingly.

Automating the SBA loan funding process using Optical Character Recognition to compare and validate data across various sources and update systems accordingly.

Developed a bot-initiated automated process to expedite the FY18 HUD Grantee Survey. Automated process collected and processed FY18 survey responses in 4 weeks when the manual process had taken 6.5 months.

Developed an automation for the National Cancer Institute that will perform validations of financial system master data and correct missing data elements to support accurate financial reporting.

Supporting the Tennessee Valley Authority in setting up an RPA Center of Excellence to encompass governance, standardization, and efficacy of automation efforts across all areas of the organization.

AGENCY: Office of the Under Secretary of Defense (Comptroller) (OUSD(C))

CHALLENGE
The Department of Defense is a very large organization with dispersed systems and processes, many of which are highly manual and repetitive. OUSD(C) stood up an FM Reform team with the goal of analyzing these processes and reducing the manual backlog of activities. The team is using RPA to accomplish these tasks and is focused on scaling the program in a way across the Department.

MISSION: Become an Automation Center of Excellence by providing best business practices for automation programs, as well as the necessary infrastructure and tools to build and sustain automation programs that provide meaningful value to the Department.

SOLUTION (TWO PRIMARY FOCUS AREAS)
- AWS Gov cloud deployed, high availability RPA infrastructure and platform that provides:
  - DoD RPA programs with tools to improve the management, oversight, and scaling of their automation programs (UiPath Orchestrator).
  - Additional RPA tool options on the horizon (e.g., Unattended automations, Automation Anywhere, etc.).
- Automations: Building/sharing/partnering on automations to increase impact and scale.

BENEFIT/IMPACT
- The Center of Excellence will lay the foundation for the RPA program to continue in a scalable way, well into the future.
- Platform and/or Automation Partners: 10 DoD Organizations connected to Advana’s UiPath Orchestrator Platform, executing 40+ automations.
- (OUSD(C)) to date has deployed 30 automations; with another 15 automations currently in test. Once scaled, the initial 30 automations are estimated to redirect approximately 60,000 labor hours to other tasks.
OSD(C) – RPA Architecture

AWS Gov cloud deployed, high availability RPA infrastructure and platform:

• UiPath currently operational; in process of standing up similar Automation Anywhere offering.
• High Availability is achieved using AWS snapshots instead of UiPath (HA) nodes. This will be far more cost effective, scalable, and efficient.
• Separate Dev/Test and Production Orchestrator environments.
• Scalable VDI pools for both UiPath Studio development as well as production pools for bot runners (Desktop and Unattended).
  • VDI can be substituted by self-hosted VMs, EC2 instances, or containers.
  • Windows Server VM instances can run up to 8 unattended bots each.
• Cloud Hardware Security Module (HSM) hosted on AWS to provide FIPS Level 3 security for NPE credentials.
  • HSM Client is installed on each Virtual Machine running UiPath. This will enable connectivity to the CloudHSM.
• Logging and audit via MS SQL and Elastic Search. Reporting via Qlik or Kibana.
• Support for multiple tenants in each environment.

Calculating Return on Investment
Return on Investment

**Time Savings** = 
\[(\text{GS Level}) \times \text{(Annual Time Savings)}\]

<table>
<thead>
<tr>
<th>Savings Factors</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Savings</td>
<td>Calculated based on the number of people currently performing the work and how long each person spends on the process.</td>
</tr>
<tr>
<td>Redirected Labor Costs</td>
<td>Calculated based on the number of people currently performing the work, how long each person spends on the process, their rank or GS level, and the average salary by GS level.</td>
</tr>
<tr>
<td>Human Error Reduction</td>
<td>Estimated based on process benchmark data and the downstream impacts when an error is made.</td>
</tr>
<tr>
<td>Cycle Time Reduction</td>
<td>Estimated based on the impact to the organization of getting to the results of the process quicker.</td>
</tr>
</tbody>
</table>

For example:

A process is performed weekly, and typically takes 2 hours to complete.

The person who performs the process is a GS-12. Based on the GS pay scale, the average salary of all GS-12 steps is $93,780.10.

\[
\text{Savings} = \text{\$93,780.10 per year} \times \frac{\text{year}}{1800 \text{ hours per process}} \times 2 \text{ hours per process} \times \frac{52 \text{ processes per year}}{\text{year}} = \text{\$5,418.41 per year}
\]

**There may be other associated costs that could impact ROI such as development time, infrastructure, operations costs. These factors should be taken into consideration when capturing a complete picture of ROI.**

Vendor Selection and Licensing

#RPA20
Vendor Selection

<table>
<thead>
<tr>
<th>Criteria Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Capability</td>
<td>Technical automation components that are available – ex. document processing, Citrix integration, web app integration, etc.</td>
</tr>
<tr>
<td>True Cost of Ownership</td>
<td>Total cost of partnering with vendor including vendor licensing, third-party software licensing, infrastructure, required staffing &amp; salary, training, etc.</td>
</tr>
<tr>
<td>Skill Set of Vendor Development &amp; Operations Teams</td>
<td>Details what kind of knowledge each business unit has – are the developers process experts with limited technical skills or are they software developers?</td>
</tr>
<tr>
<td>Security, Compliance &amp; Regulatory Requirements</td>
<td>How are vendors able to address these requirements?</td>
</tr>
<tr>
<td>Support for Infrastructure Environment</td>
<td>Can vendors meet the requirements for on premises versus cloud hosted environments? What about Windows vs. Linux?</td>
</tr>
<tr>
<td>Documentation &amp; Support</td>
<td>Available resources for training and learning – i.e., does the vendor have free learning resources or an online forum? How developed is their documentation?</td>
</tr>
<tr>
<td>Market Position</td>
<td>How well a particular vendor is positioned compared to its competition.</td>
</tr>
</tbody>
</table>

Many organizations are experiencing growing demand to streamline operations. The selection process for a vendor might vary based on industry, regional support, and application, however there are several key elements all groups need to consider when selecting an RPA vendor.

- Partnerships with the main vendors
- Vendor comparison dossiers
- Demos of various tools
- Software security information
- IT software approval assistance
- Small scale and full scale deployment

Our Solution

- RPA Key Vendor Dossiers
- Client-specific assessments of RPA Vendor’s technology, market impact, vision and capability

#RPA20
## RPA Vendor Licensing

<table>
<thead>
<tr>
<th>Vendor/Tool</th>
<th>Free Version(s) Available</th>
<th>Licensing Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>UiPath</td>
<td>• Community Edition (all time access)</td>
<td>By Component (i.e. Orchestrator License, Studio License, Unattended Robot License, etc.)</td>
</tr>
<tr>
<td></td>
<td>• Enterprise RPA Platform (60 day trial)</td>
<td></td>
</tr>
<tr>
<td>Blue Prism</td>
<td>• Blue Prism Learning Edition (180 days)</td>
<td>By Robot Runtime</td>
</tr>
<tr>
<td></td>
<td>• Free Trial (30 day trial)</td>
<td></td>
</tr>
<tr>
<td>Automation</td>
<td>• Community Edition (all time access)</td>
<td>By Component (i.e. Bot Runner licenses, Bot Creator licenses, Control Room, and an Enterprise License fee)</td>
</tr>
<tr>
<td>Anywhere</td>
<td>• Enterprise Edition (30 day trial)</td>
<td></td>
</tr>
</tbody>
</table>

### Infrastructure Current State

![Diagram of Infrastructure Current State]

Examples of Global Services:
- AWS Tools and SDKs
- AWS CloudTrail
- Amazon CloudWatch
- AWS Identity and Access Management (IAM)
- AWS Single Sign-On
Future Production Workflow

- ~45,600 abstracts parsed
- ~30 abstract URLs processed

Wrap Up

- Thank you for your participation!
- For more information on using RPA in your organization, please reach out to:
  - Sri Iyer, Director, siyer@Guidehouse.com
  - Ranyah Salous, Managing Consultant, rsalous@Guidehouse.com
  - Rucha Bhide, Consultant, rbhide@Guidehouse.com