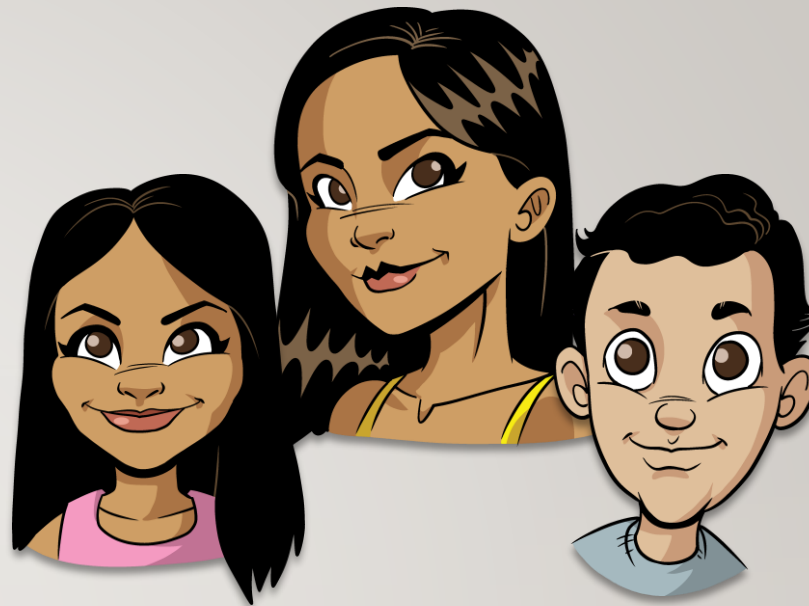


THE RISE AND BENEFITS OF ROBOTIC PROCESS AUTOMATION (RPA)

THOMAS HAVER



<https://red-green-refactor.com/>

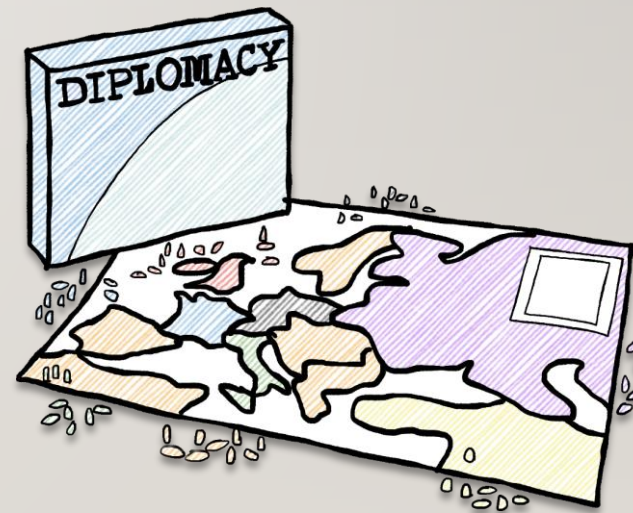
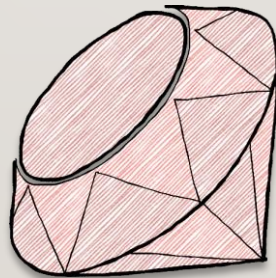
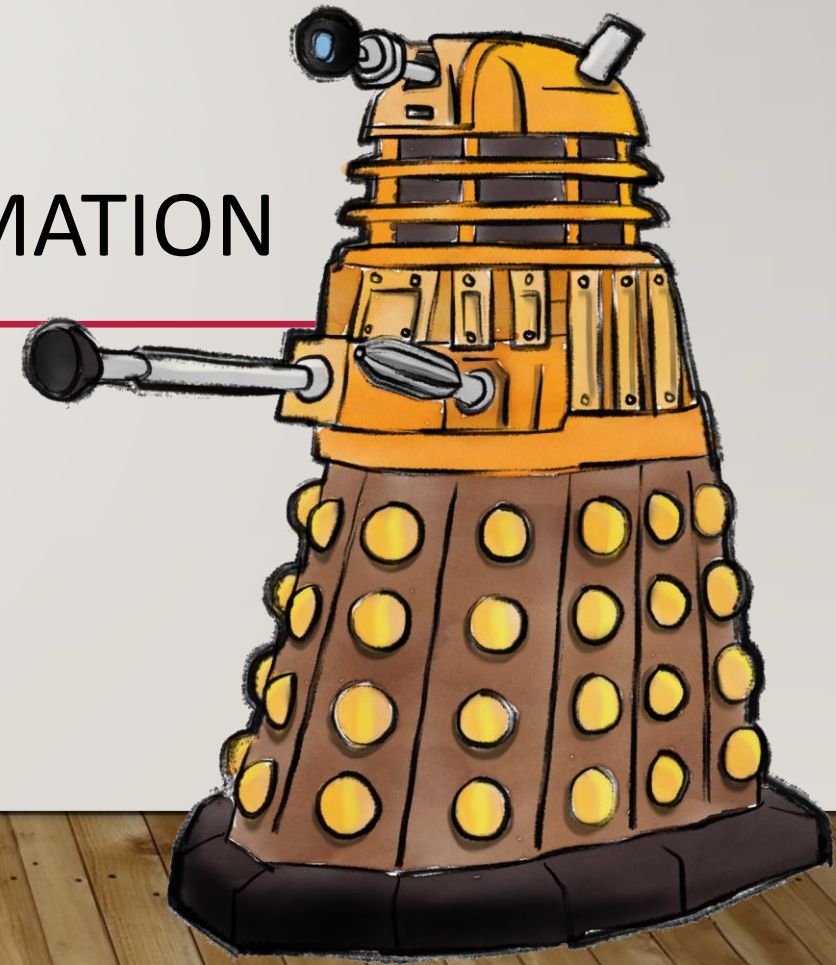


TABLE OF CONTENTS

- What is RPA
- Benefits of RPA Adoption
- RPA Use Cases
- The RPA Journey
- Tool Comparison (UiPath, Blue Prism, and Automation Anywhere with special guest Power Automate)
- Metrics

WHAT IS ROBOTIC PROCESS AUTOMATION



RPA

Robotic Process Automation (RPA) is a term given to technology that allows developers to programmatically emulate the actions of a human to execute a business process.

RPA often executes on the user interface (UI) layer to capture data or interact with an application or across multiple applications to perform tasks that are considered repetitive or time-consuming.



Aristarkh Lentulov
Workers of the Kerch Factory

BOTS

- Bots are a programmed sequence of automated activities performed by a tool
- Bots can do something as simple as navigate to a webpage or as complex as provide a decision recommendation on a mortgage loan application

BOT TYPES

ATTENDED

- Attended bots mean the user is working with the robotic process in the background such as data entry assistance in onboarding a new employee for HR

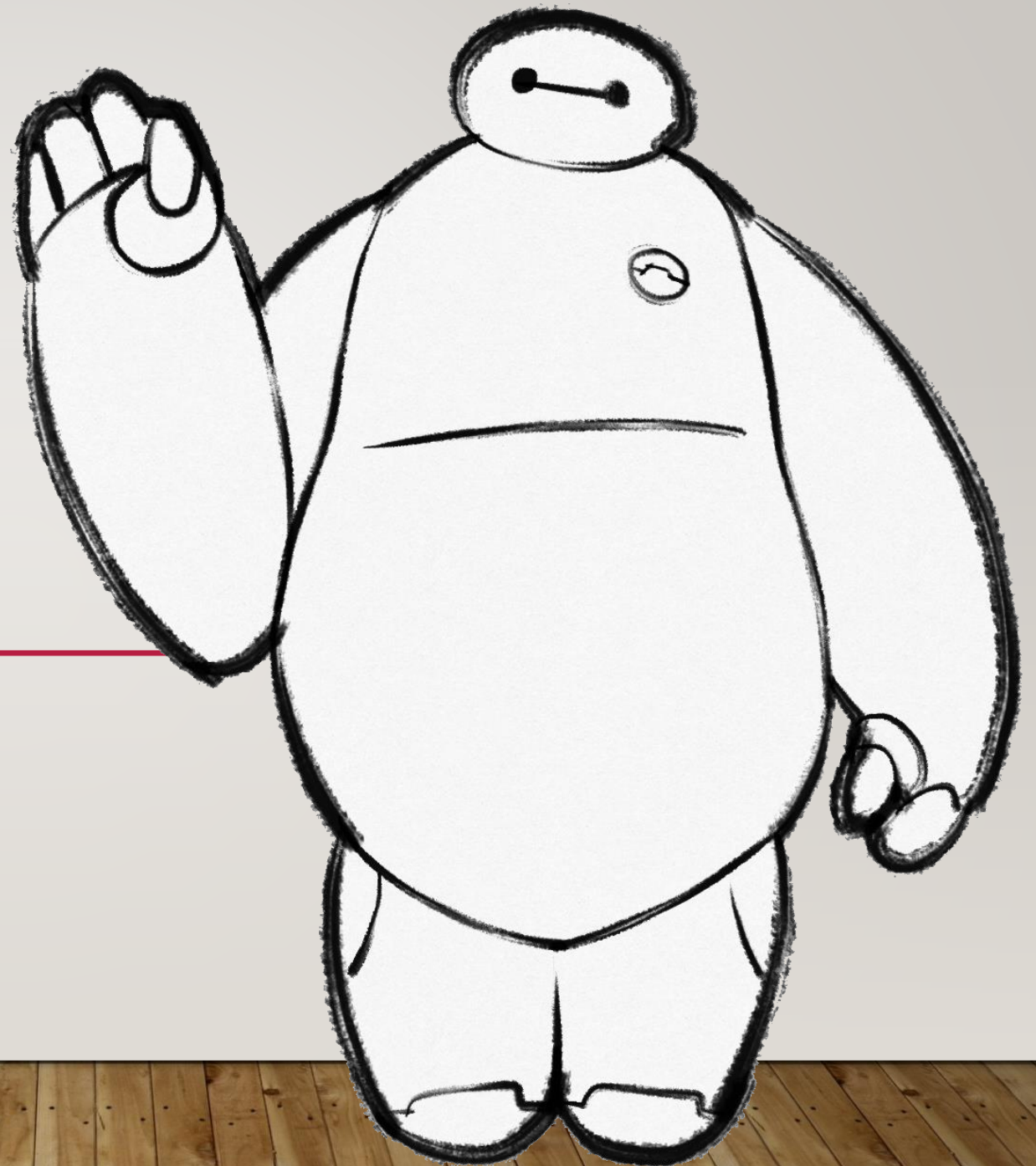
UNATTENDED

- Unattended bots mean the robotic process executes in absence of human interaction such as processing invoices

CATEGORIES OF RPA SOLUTIONS

1. **Assisted** - bot(s) are deployed to a human worker's local workstation to help with common user tasks
2. **Unassisted** - bot(s) are deployed on a server and can be manually controlled
3. **Autonomous** - bot(s) cover more complicated processes that often have decision trees such as changing priorities based upon external input or workload balance
4. **Cognitive** - bot(s) are integrated with AI technologies such as machine learning and natural language processing

BENEFITS OF RPA



WHY RPA?

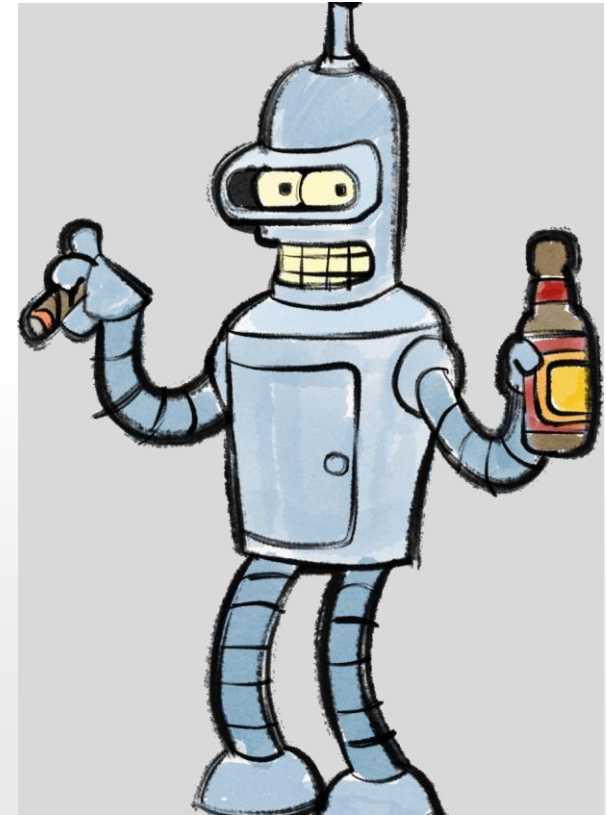
- Fast Return On Investment (ROI)
- Minimal upfront investment for Proof Of Concept (POC)
- Limited disruptions on the systems they interact with for automated workflows

Buy over Build

- Commercial tooling includes libraries of automation workflows that can be applied to specific application types and industry use-cases

ERRORS AND LOGGING

- Human data entry is prone to error for repetitive tasks, which is directly addressed with automated workflows
- Tooling has activity logging to help identify failure points so the cause of those exceptions can be fixed
- The logging of RPA activity has an additional benefit of helping to ensure regulatory compliance



Damian Synadinos
Bender in Oil

RISKS AND REWARDS

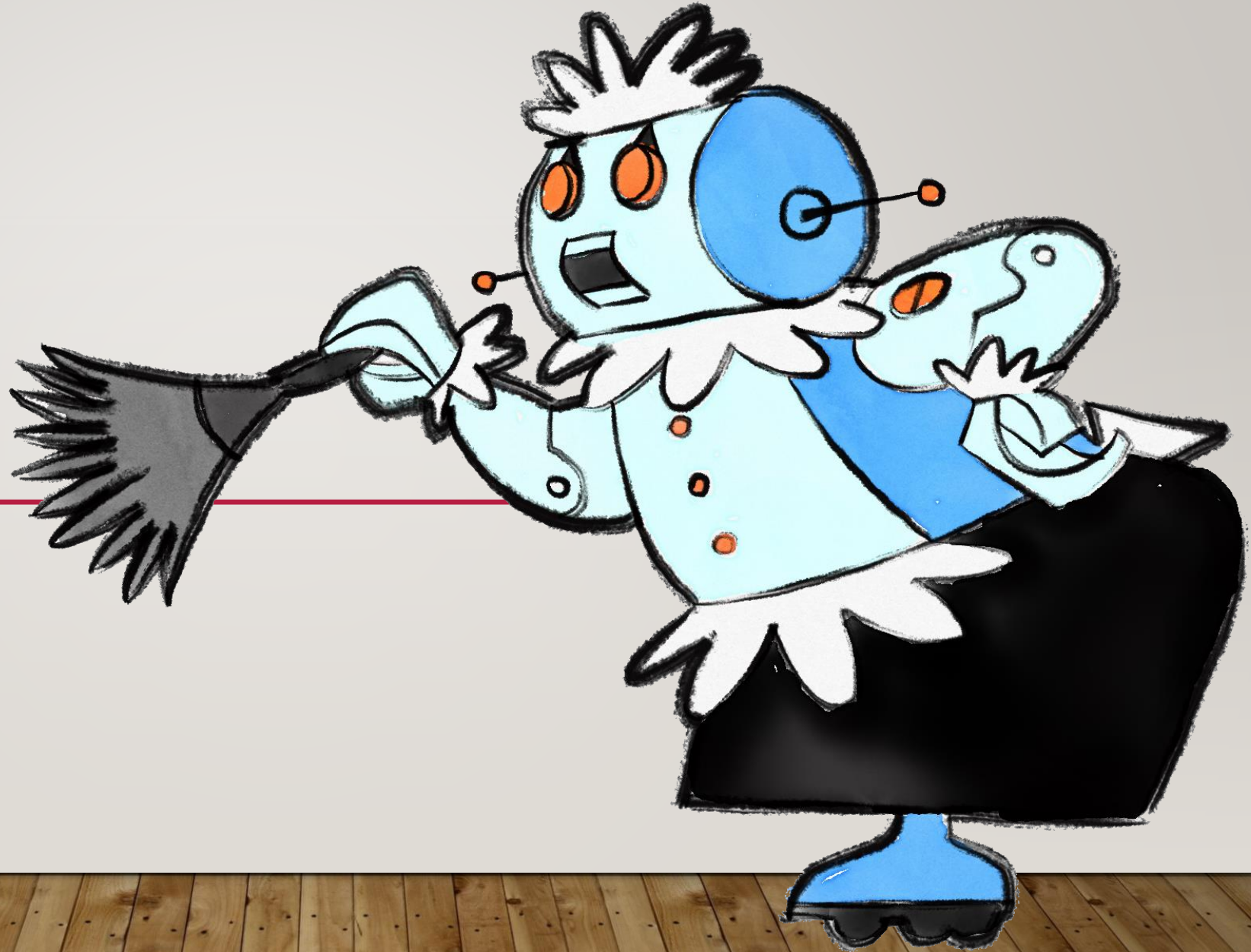
RISK

- Risk of revealing Personally Identifiable Information (PII)
- Sarbanes-Oxley (SOx) Act compliance
- Program never proceeds beyond initial or POC stages

REWARDS

- Speed of processing time over manual workflows
- Ease of adoption
- Ease of scaling
- Speed to achieving “cost neutral” status
- Implementation across business segments
- Reduction in errors
- Built-in logging for failure analysis & regulatory compliance

RPA USE CASES



WHAT CAN RPA DO FOR YOU?

- Task Areas of Focus: repeatable, high volume, and business centric
- Common tasks include:
 - Logging into an application
 - Moving files from one source to another
 - Reading & writing to databases
 - Opening emails & attachments
 - Scraping data from web & desktop applications
 - Connecting to systems APIs
 - Processing content from PDFs

USE CASE #1

Text Analysis

- Scanning documents such as insurance forms, purchase orders, invoices, emails, etc.
- HR: assist with payroll, employee & contractor onboarding, terminations, and benefits administration
- Ops: inventory management, invoicing, planning, and content scanning of contracts
- Service Desk: password resets, scheduling appointments, address changes

USE CASE #2

ATM Data Processing

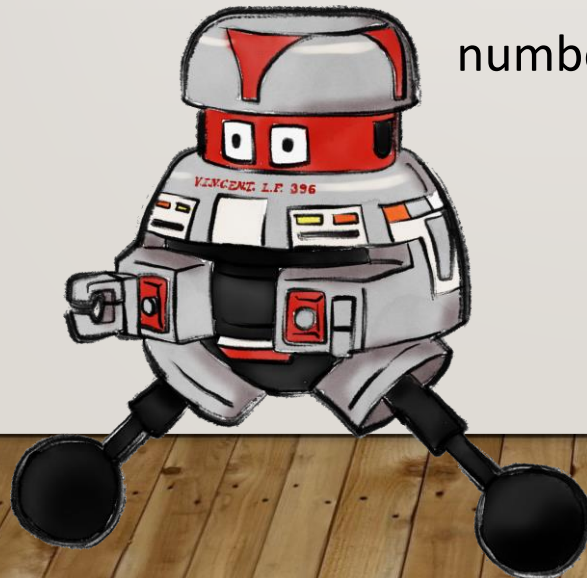


- ATM results in a great deal of data being transferred between the machines and back-end systems
- A bot can extract and compare data records for multiple systems (web and desktop) to improve the processing speed of data records and reduce the time needed to handle data
- Benefits: fewer errors and faster processing time of the workflow

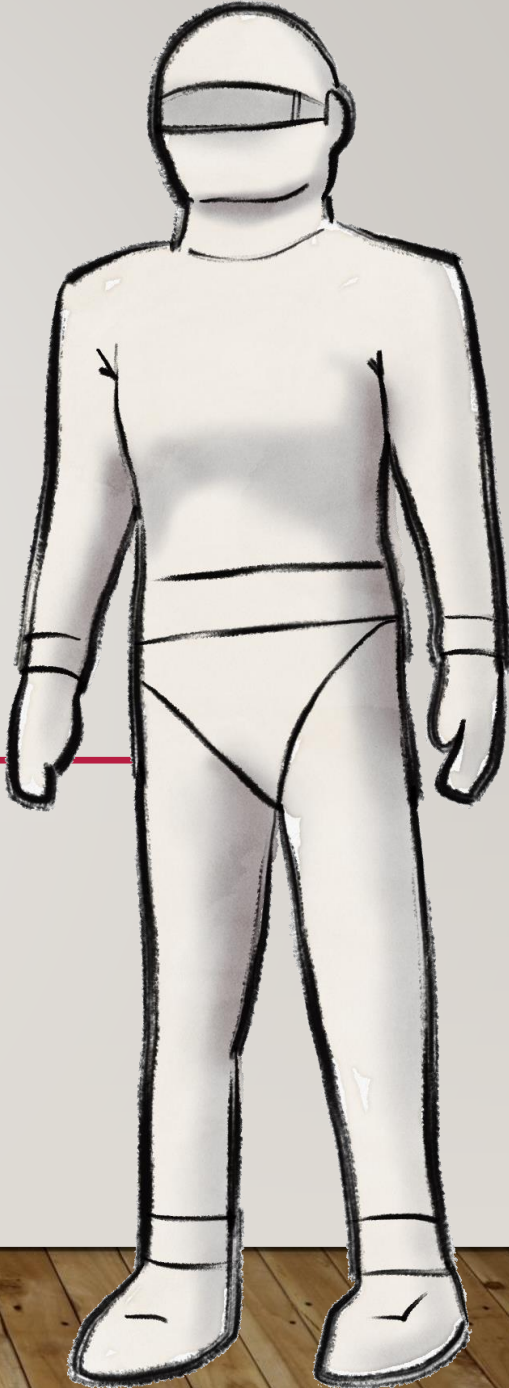
USE CASE #3

Account Creation

- Streamline an account creation process that would typically be hundreds of new accounts per month at about 6 minutes per account that crossed three different applications
- This process had multiple decision points around mortgage length, credit ratings, and customer status
- Benefits: reduction in both processing time and number of errors during data entry



THE RPA JOURNEY



BUILDING A PROGRAM

A successful program begins with a small proof of concept and alignment of people, process, and technology

Expectations:

- The RPA solution should operate across the same layers of the application as a human worker
- Libraries integrate with standard tech stack and reusable components
- Version Control
- Set the level of internal technical prowess (code vs low code vs codeless)
- Standard for defect tracking and associated test coverage



Damian Synadinos
Mr. Robot in Oil

KEEP THE ENTERPRISE IN MIND

- If the expectation for the RPA solution is an enterprise-wide deployment, then scalability and deployment strategy must be an upfront concern
- Questions to ask:
 - Will the bots run on virtual machines or in the cloud?
 - Will the bots be attended, unattended, or both?
 - Will the platform support web services (REST, SOAP)?
 - Do you have a central application server to orchestrate?
 - What security standards do you have in place?

ORCHESTRATE EXECUTION

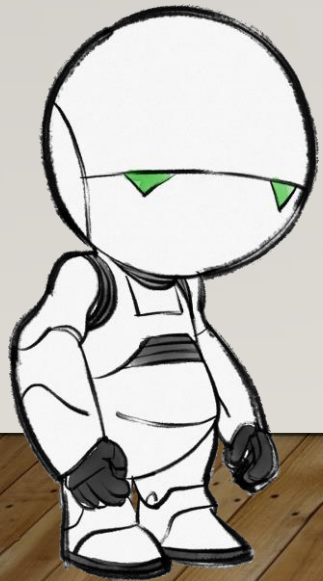
- Many vendors have some form of central control to orchestrate execution
- Purpose: track execution, separation of duties, execution schedules, total execution time, logging, and support for execution failures
- Without orchestration you risk having runaway bots that are poorly tracked and you miss reuse benefits



Salvador Dalí
The Persistence of Memory

WORDS OF WARNING

- Risk of revealing Personally Identifiable Information (PII) as well as adherence to Sarbanes-Oxley (SOx) Act
 - Multiple bots should be created to achieve separation of duties to ensure user credentials and customer data are not leaked
 - Bots should receive the same degree of governance as human workers or higher to help ensure sanctity of data
- Solution: Using a credentials vault, role-based access control, activity logs, and audit trails



ROLES AND RESPONSIBILITIES

A new team must be formed to support the RPA program, which include a mix of individuals focused on either the strategic or tactical aspects of the implementation



Rembrandt van Rijn
The Night Watch

ROLES AND RESPONSIBILITIES

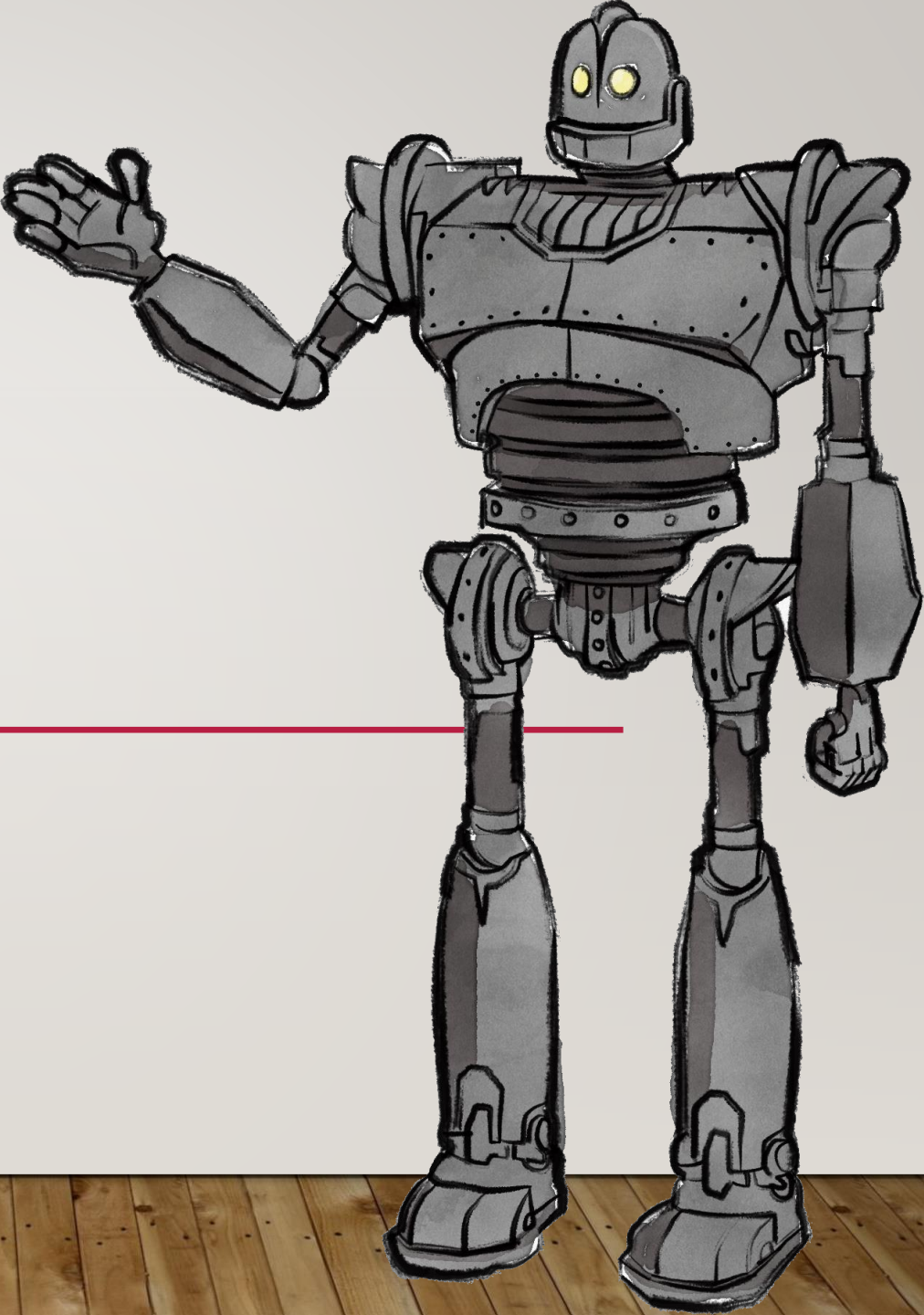
TACTICAL

- The RPA Developer role includes the experts responsible for developing and testing the bots
- The Architect role is to design the solutions, select tooling, and establish guidelines for adoption across the enterprise

STRATEGIC

- Champion to advocate for adoption across multiple business segments and help secure funding
- RPA analysts who have domain knowledge about the business and are responsible for creating the process flows that will be implemented by the RPA developers

TOOL COMPARISON



THE RIGHT TOOL FOR THE JOB

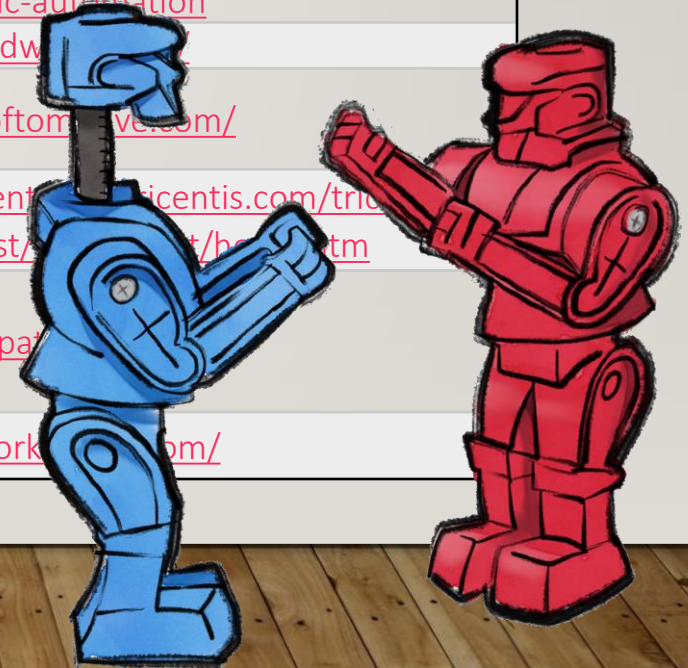
Key questions to ask when shopping:

- Will the organization want to pay on a per-transaction or per-process basis?
- Do they want to pay for fixed usage or variable usage capacity?
- Do you have access to training and documentation?
- What is the product support model?
- How often is the platform updated?
- What is the feature roadmap?
- Who are the business partners & can those pre-built libraries be used immediately?



Jakub Rozalski
1920+ Project

Vendor	Product	Website
Another Monday	Another Monday RPA	https://www.anothermonday.com/
AntWorks	ANTstein	https://www.ant.works/
Automation Anywhere	Automation Anywhere Enterprise & Community, Bot Insight, Bot Farm, Bot Store, and IQ Bot	https://www.automationanywhere.com/
Blue Prism	Blue Prism	https://www.blueprism.com/
Contextor	Contextor Studio, Control, Standalone Bot, and Galaxy	https://contextor.eu/en/contextor-2/
EdgeVerve	AssistEdge	https://www.edgeverve.com/assistedge/
Kofax	Kapow	https://www.kofax.com/Products/rpa/overview
Kryon Systems	Kryon RPA	https://www.kryonsystems.com/
Nice	NICE Robotic Automation	https://www.nice.com/rpa/
Pegasystems	Pega Robotic Automation and Intelligence	https://www.pegasystems.com/products/pega-platform/robotic-automation
Redwood Software	Redwood Robotics	https://www.redwoodrobotics.com/
Softomotive (acquired by Microsoft)	Process Robot and WinAutomation	https://www.softomotive.com/
Tricentis	RPA Studio	https://documentation.tricentis.com/tricentis-rpa-studio/latest/whats-new/whats-new.htm
UiPath	Studio Pro, Studio X, Test Suite, Orchestrator, Automation Cloud, AI Fabric	https://www.uipath.com/
WorkFusion	WorkFusion Intelligent Automation	https://www.workfusion.com/





BLUE PRISM

- Blue Prism design studio has a low technical hurdle compared to most traditional automation but does require some programming
- Drag-and-drop UI design
- Citrix and virtual desktop infrastructure (VDI) integration
- Third-party accreditation for certification

AUTOMATION ANYWHERE



- Originally focused on desktop solutions but expanded their offerings to include most application types
- Building RPA workflows in Automation Anywhere also has a low technical hurdle
- Advanced workflows required knowledge of XML or C#
- The platform provides a central control feature, scheduling, and triggering capabilities
- Accreditation for certification

POWER AUTOMATE (FORMERLY FLOW)











- Cloud-native, low-code automation platform with UI- and API-based automation.
- Offers training and learning resources as part of their partner program.
- Focused on a solution that has a low entry barrier; anyone can start at no cost and deploy locally.
- Scope of platform includes process discovery, automation ideation, ROI calculation, and portfolio management. Native support for OCR, document handling, analytics, etc.
- The "AI Builder" has prebuilt and customizable AI models for processing structured and unstructured content.



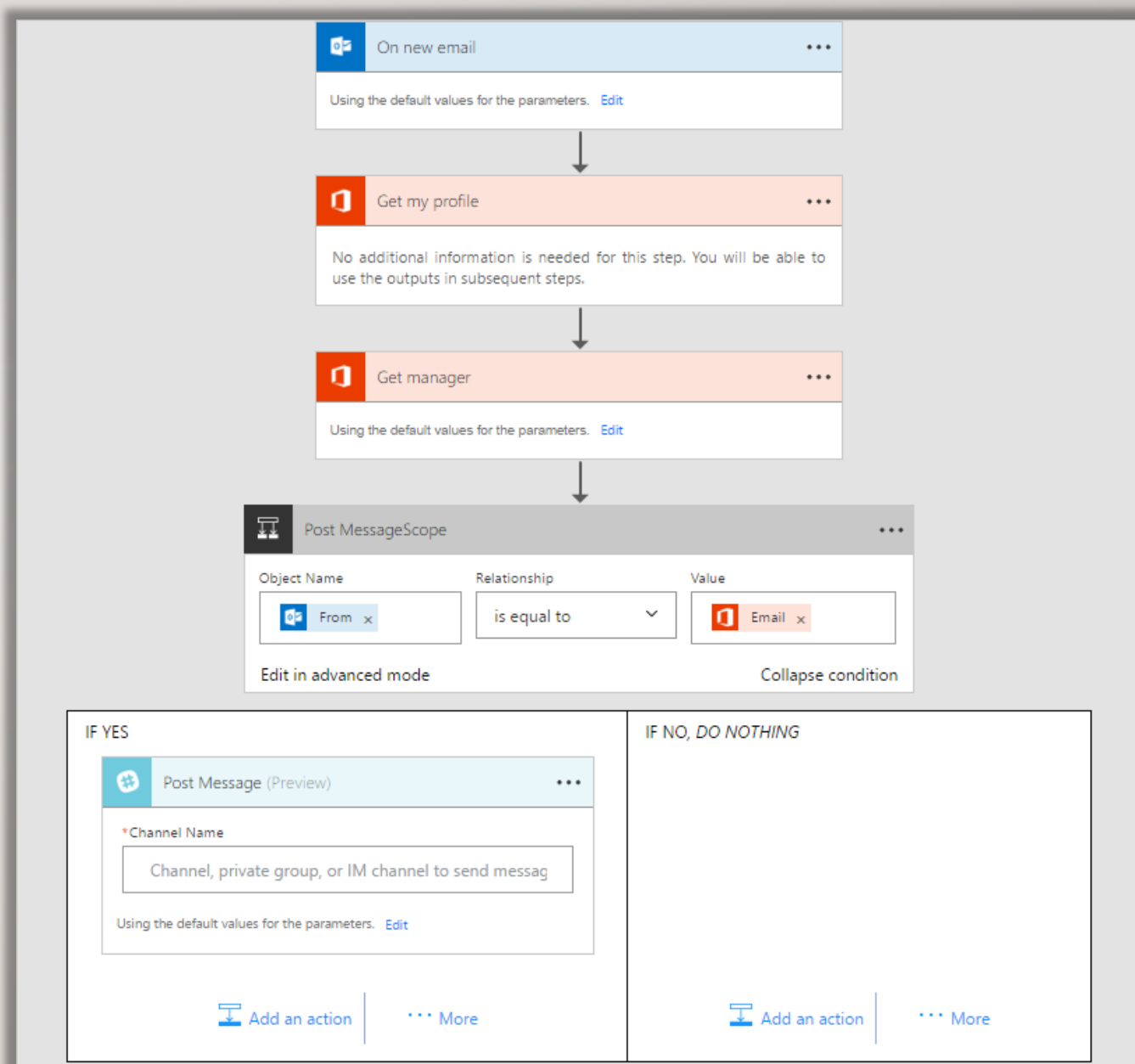
POWER AUTOMATE

- Hundreds of templates (600+) designed for a specific purpose.
- For instance, there is a template for sending yourself a text message when your boss emails you.

 <p>Keep my schoolwork in sync with my Google Drive By Microsoft</p> <p>Automated 3441</p>	 <p>Save Gmail attachments to a Dropbox folder By Microsoft</p> <p>Automated 3116</p>	 <p>Get daily reminders from your Outlook.com email By Microsoft</p> <p>Scheduled 2700</p>	 <p>Run sentiment analysis on tweets and push results to a Power BI dataset By Microsoft</p> <p>Automated 3443</p>
 <p>Notify and Email when a new file is uploaded to OneDrive By Microsoft Power Automate Community</p> <p>Automated 1733</p>	 <p>Create an issue in Azure DevOps when an email is received By Microsoft Power Automate Community</p> <p>Automated 3017</p>	 <p>Send an email for new Tweets about a certain keyword By Microsoft</p> <p>Automated 3224</p>	 <p>Trigger a flow with a Power BI data-driven alert By Microsoft</p> <p>Automated 50041</p>

POWER AUTOMATE FLOW EXAMPLE

- Leverages Office 365 and Slack
- When you receive an email from your boss, the flow will send you a notification.
- In Power Automate, any action that requires “developer” input are automatically expanded.

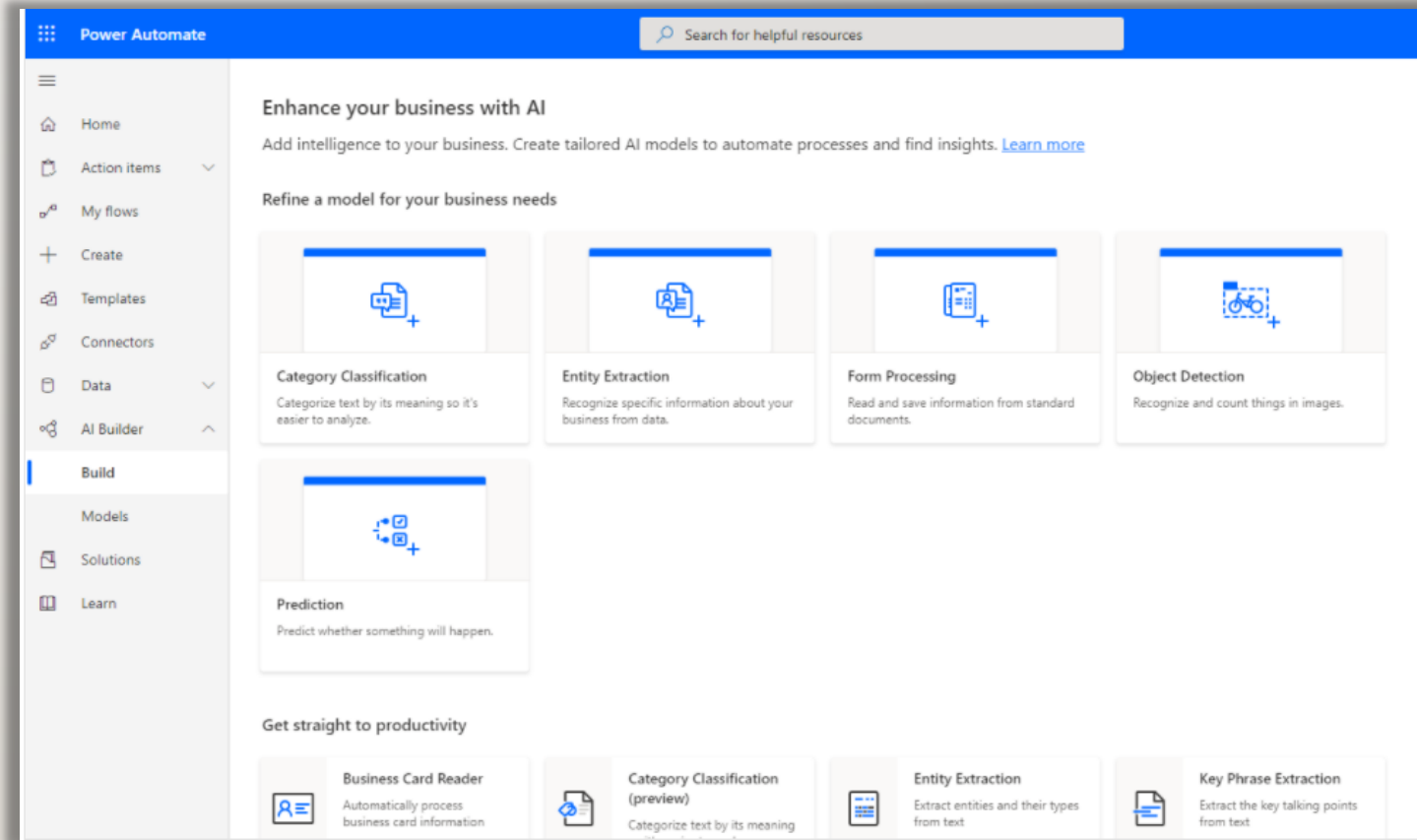


AI BUILDER



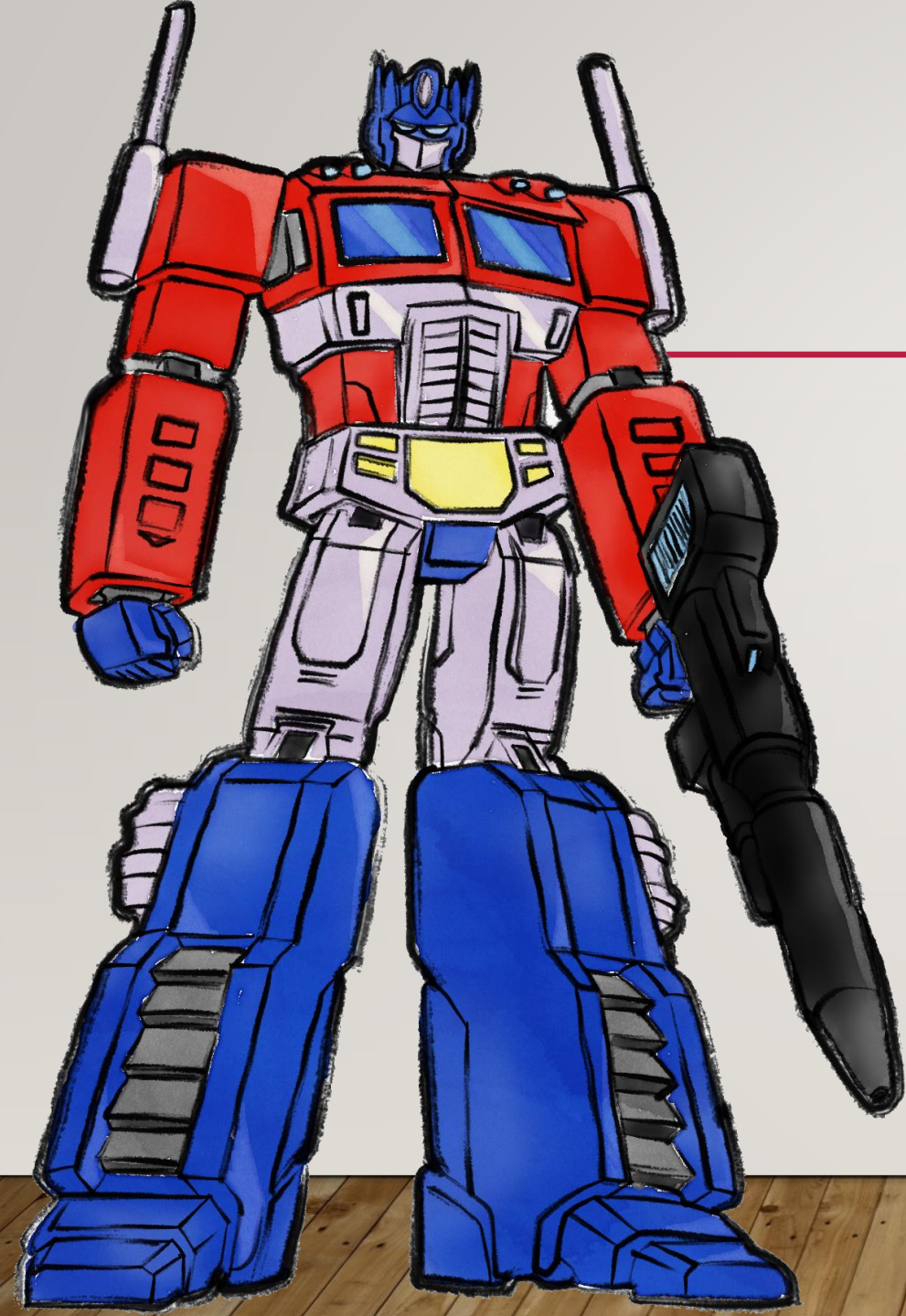
- AI Builder has multiple model types built-in to Power Automate
- Capable of category classification, language detection, prediction, form processing, object detection, etc.

Business Scenario	Model Type
Automate expense reports	Receipt processing
Categorize user feedback based on their focus	Category classification
Identify and classify customer feedback	Sentiment analysis
Identify fraudulent transactions	Prediction
Get alerted to social media posts referencing your brand	Key phrase extraction





UIPATH



- UiPath offers a Robotic Process Automation platform with integrations for cloud orchestration, testing, and AI
- They have a customer base in excess of 3,000 including many Fortune 500 companies and in 2021 were valued at \$35 billion
- Why have they become so popular?
 - Good marketing
 - Robust training program
 - Multiple tiers of IDE to fit technical skillset
 - Support for most standard tech stacks with pre-built activities
 - Strategic partnerships with integrations to other tech
 - Test Manager



MARKETS

BUSINESS

INVESTING

TECH

POLITICS

CNBC TV

WATCHLIST

CNBC DISRUPTOR 50

UiPath climbs 23% in stock market debut after one of largest US software IPOs in history

PUBLISHED WED, APR 21 2021-12:30 PM EDT | UPDATED WED, APR 21 2021-4:04 PM EDT



Ari Levy
@LEVYNEWS

SHARE



- UiPath and its investors sold about 23.9 million shares at \$56 apiece, bringing in \$1.34 billion in the IPO.
- The company, whose software automates repetitive office tasks, generated \$607.6 million in the last fiscal year, an increase of 81% from the prior year.
- If underwriters buy their allotted shares, it will be the third-biggest U.S. software IPO, behind Snowflake last year and Qualtrics in January.



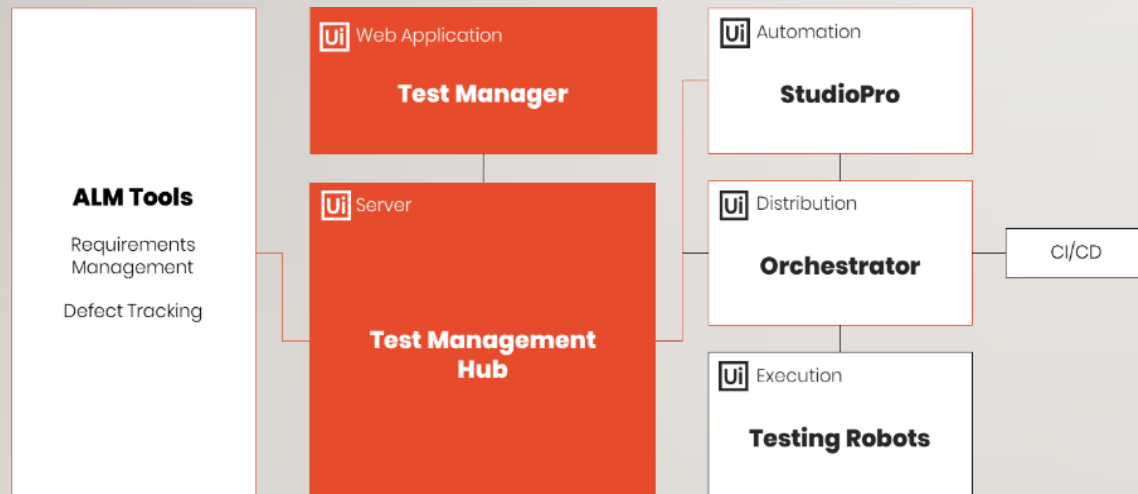
UIPATH TOOLING | STUDIO PRO

- Studio Pro allows a developer to create automated tests just like RPA workflows
- Studio X version for less technically adept team members to create workflows then import into Studio Pro
- RPA testing capabilities for testing workflows and viewing activity coverage (Given, When, Then)
- Support for API testing via Postman (ability to import collections in Postman)
- Orchestrator is capable of executing test cases from Studio Pro in a scheduled manner or via CI/CD pipeline
- Capabilities in Studio Pro for natural language processing (NLP), optical character recognition (OCR), and machine learning (ML)

The image displays two overlapping screenshots from the Studio Pro application. The background screenshot shows the 'Project' window with a tree view of a project named 'RPA Cover'. The tree view includes folders for 'Dependencies', '.settings', '.tmh', 'RPA Process', 'Show Coverage', and 'UiBankLoan'. Under 'UiBankLoan', there is a 'Process' folder containing 'Create Loan.xaml'. A context menu is open over 'Create Loan.xaml', listing actions such as 'Open', 'Open File Location', 'Rename', 'Delete', 'Select for Compare', 'Find References', 'Add', 'Debug File', 'Set as Global Hand', 'Set as Main', 'Create Test Case', and 'Convert to Test Case'. The foreground screenshot shows the 'RPA Test Case' window. It features a 'Given' section with a 'Drop Activity Here' placeholder, a 'When' section containing an 'Invoke RPA Process' activity with the path 'UiBankLoan\Process\Create Loan.xaml' and buttons for 'Import Arguments' and 'Open Workflow', and a 'Then' section with another 'Drop Activity Here' placeholder.

Activity Coverage 60% of the activities from your workflow have been covered during test execution

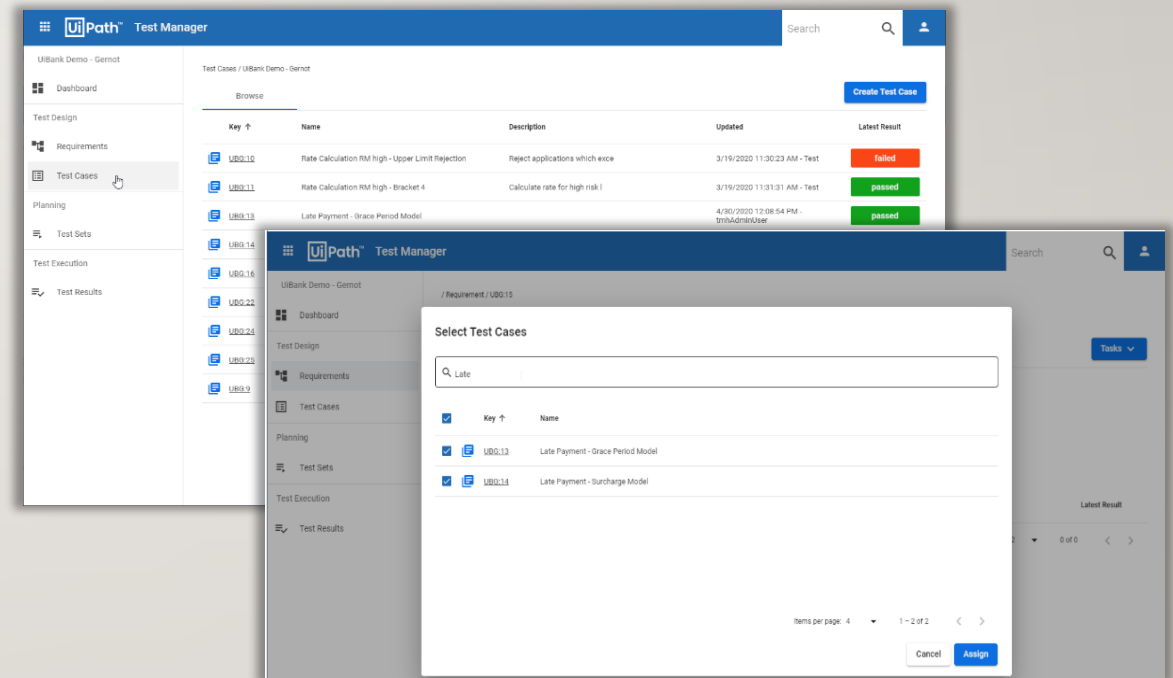
UIPATH TOOLING | TEST MANAGER



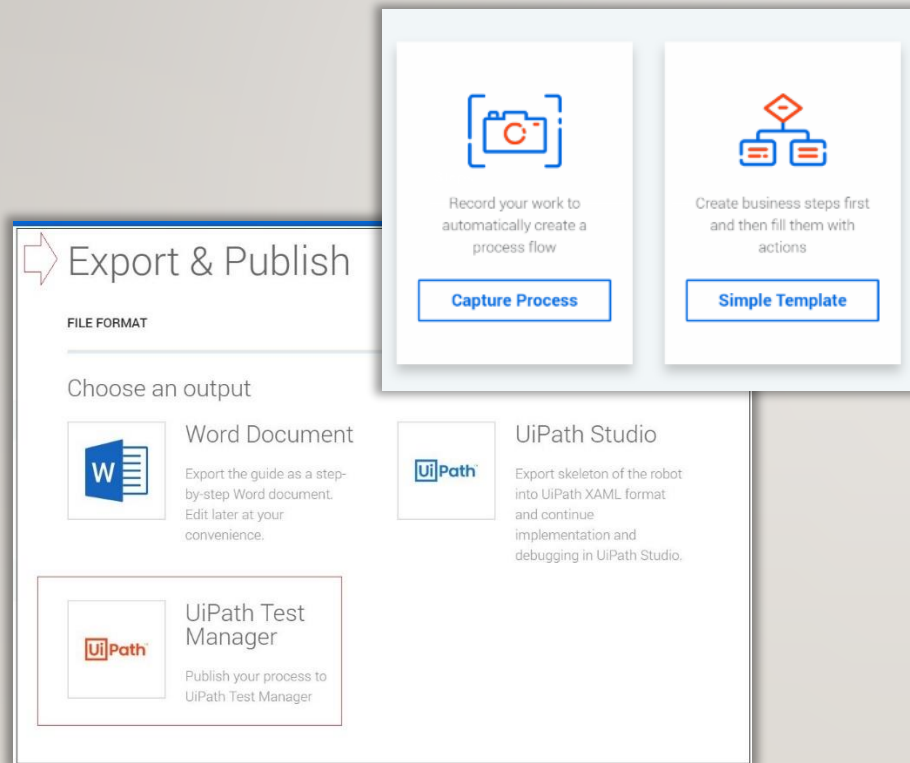
- The “Test Manager” can be used to manage tests, while “StudioPro” is for automating tests, with the orchestrator and robots acting to distribute and execute the tests
- The Test Management Hub integrates the UiPath Test Suite with other tools
 - Assign test cases to requirements
 - Update User stories
 - Bug reports with log information and screenshots

UIPATH TOOLING | TEST MANAGER TO STUDIO PRO

- Test Manager contain several “connectors” (libraries used to connect to external ALM tools)
- Ability to synchronize requirements between the tool and an external source
- Test Cases can be either manual or automated, allowing for non-technical team members to create test cases that will later be automated
- Automated Test Cases are created in UiPath’s Studio Pro and can be linked to Test Manager
 - Manual test cases can be created in Test Manager then exported to Studio Pro



UIPATH TOOLING | TASK CAPTURE



- “Task capture” functionality to document flows without manually downloading images or typing titles for each action
- Capture each step and takes screenshots with every mouse click, collecting data along the way such as execution time, text, entries, etc.
- Can be published as test cases

UIPATH TOOLING | TEST SETS

- Test cases can be grouped together (e.g. smoke tests or regression tests)
- The “Orchestrator” tool is used for automated execution while manual test sets are executed within “Test Manager”
- Execution results include basic information about the results
 - When the test was executed
 - Duration
 - Overall results
- The result of each test case can be examined with detail (screenshots, individual steps, error messages, etc.)

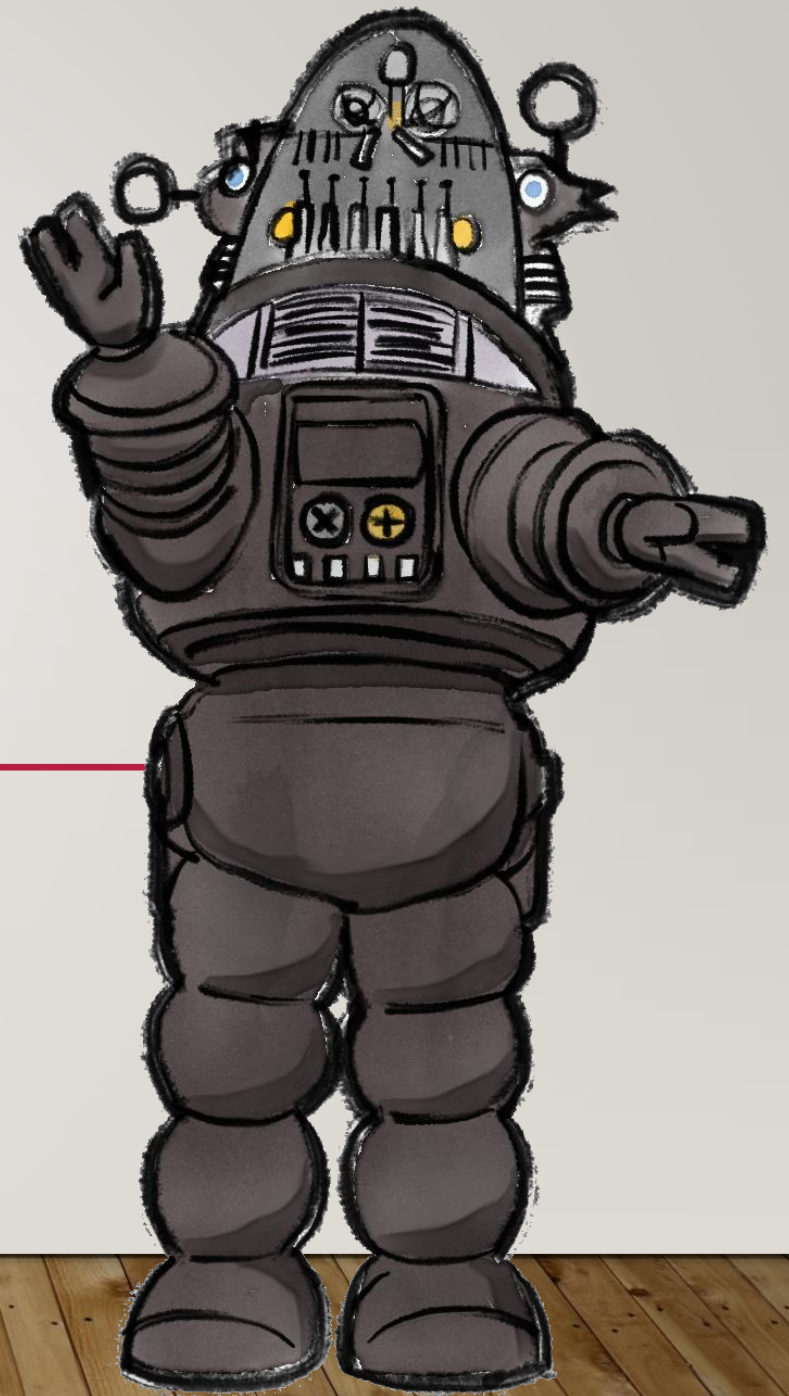
The image shows two overlapping screenshots from the UiPath Test Manager interface. The top screenshot is a 'Create Test Set' dialog box with the following fields:

- Test Set Name:** A text input field containing 'Name of the Test Set'.
- Description (optional):** A larger text area for additional information.
- Labels:** A section with the text 'Click to add label'.
- Buttons:** 'Cancel' and 'Create' buttons at the bottom right.

The bottom screenshot is the 'Test Manager' dashboard, featuring a navigation menu on the left (Scheduling, Test Execution, Test Results, Analysis, Report Library) and a main content area. The main area includes a bar chart showing test results over time (from 3/23/20 to 4/5/20), a 'Latest Results' table, and a 'CURRENT 4/8/20' summary card.

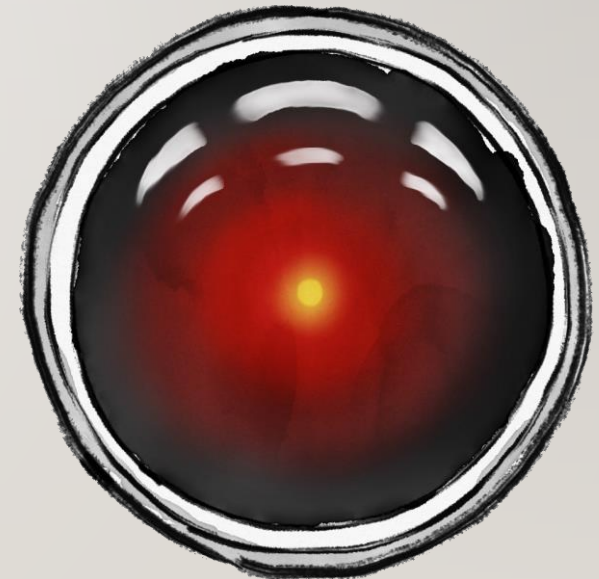
Name	Source	Tests	Execution Finished	Duration	Results
LIBank Web Regression Test Set	Orchestrator	10	04/07/2020 3:00 PM	00:00:31	<div style="width: 100%; height: 10px; background-color: green;"></div>
Manual Test Execution LIBANK-17	Test Manager	1	04/07/2020 2:58 PM	00:00:21	<div style="width: 100%; height: 10px; background-color: orange;"></div>

METRICS



KEEPING TRACK OF WORK

- Why measure? Adoption of RPA involves an investment of time and resources
- What to measure?
 - The viability of the implementation
 - Justifying the initial investment
 - Making iterative improvements
 - Help make evidenced-based decisions



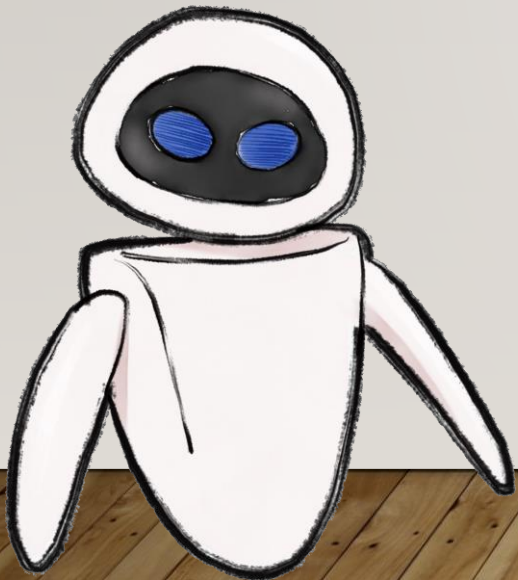
STAGES OF METRICS MATURITY

- Initial pilot stage to measure foundational work
- Mature stage to measure long-term benefits with potential enhancements

One of the challenges is understanding exactly what the “cost of doing business” is for activities

- Data entry from email to a desktop application

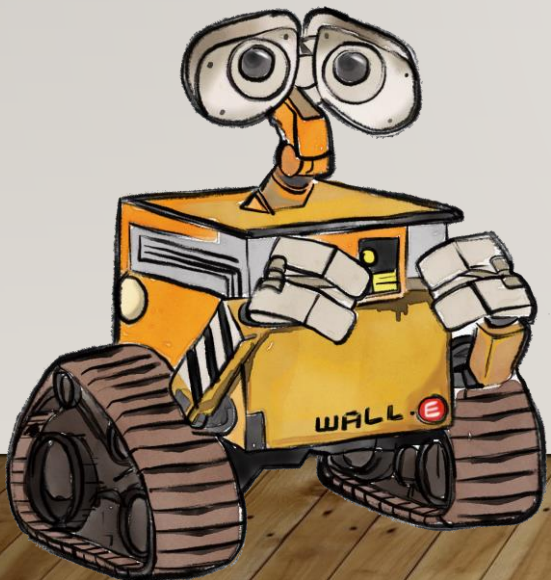
PILOT STAGE



- **Adoption Rate:** The adoption of the RPA program across business units or by candidate workflows
- **Overall Cost Savings:** Reducing tech stack size and limiting staffing size
- **Time Savings:** Time spent per workflow. Subdivided into time spent completing the workflow and the downtime in stages of the workflow that is reduced
- **Output Improvement:** Pre- and post-implementation output for a workflow (scalability of tasks)
- **Enhanced Accuracy:** Number of errors for a workflow
- **Security:** Vulnerabilities measured in the number of controls on the bots versus the people

MATURE STAGE

- **Time-to-Completion:** The time it takes to complete a process manual before and after implementation
- **Task Accuracy:** Compare the rework time plus the cost of implementing (and maintaining) that task
- **Downtime Reduction:** Compare the downtime needed to complete a workflow by humans
- **Employee Happiness:** Survey employees who are targeted to have RPA tasks implemented
- **Yearly Compliance:** Time savings in conducting those audit-related activities reduction in regulatory fines



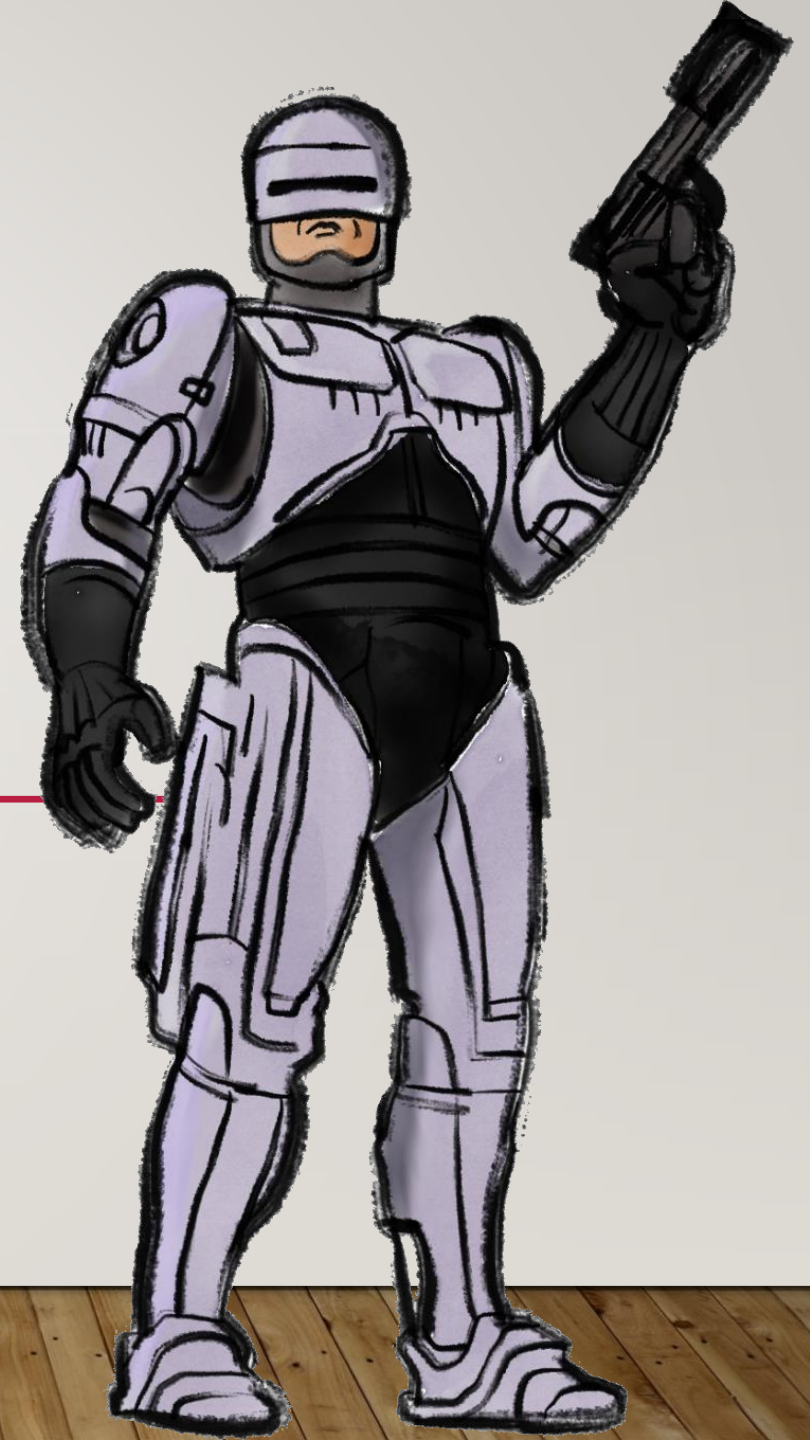
MAKE PROGRESS VISIBLE

- Good telemetry should be easily trackable, accurate, consistent, and objective
- Focus on key operation metrics like utilizations of bots and capacity versus manual tasks
- Most commercial RPA tools have analytics capabilities embedded in the orchestration tool – use them!



Damian Synadinos
Ava in Oil

KEY TAKEAWAYS



KEY TAKEAWAYS

- The sponsors for any RPA project should work side-by-side with the development team implementing the solution; build agreement with the team on the successful end-state and key performance indicators (KPIs).
- The RPA team should maintain a consistent pace for work, just like any application development team. Build the program at a steady, successful rate.
- No one metric determines success or failure of an RPA program. Use the telemetry as context to drive decisions.

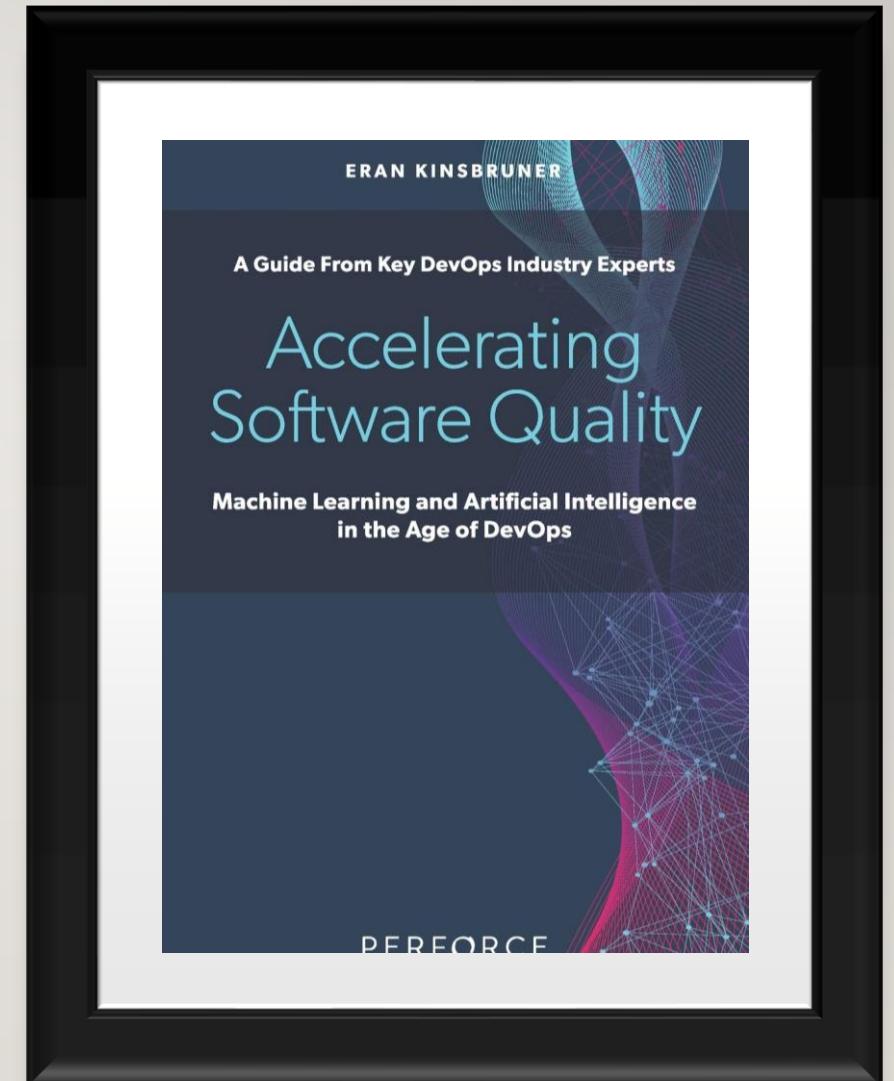
APPENDIX

SlideShare Presentation:

<https://www.slideshare.net/secret/BmpNA6A2eAAXRJ>

Book:

Accelerating Software Quality: Machine Learning and Artificial Intelligence in the Age of DevOps at [Amazon](#)



RESOURCES

1. Blokdyk, Gerardus. Robotic Process Automation RPA: A Complete Guide. 1st ed., 5STARCOOKS, 2019.
2. Murdoch, Richard. Robotic Process Automation. Independently Published, 2018.
3. Sireci, Jonathan. The Practitioner's Guide to RPA: A Practical Guide for Deploying Robotics Process Automation. 1st ed., Self-Published, 2020.
4. Surdak, Walter, et al. The Care and Feeding of Bots. Independently Published, 2020.
5. Taulli, Tom. The Robotic Process Automation Handbook. Apress, 2020.
6. Wibbenmeyer, Kelly. The Simple Implementation Guide to Robotic Process Automation (Rpa). iUniverse, 2018.
7. Willcocks, Leslie, et al. Becoming Strategic with Robotic Process Automation. Zaltbommel-Netherlands, Netherlands, Van Haren Publishing, 2019.
8. Ying, Lim Mei. Robotic Process Automation with Blue Prism Quick Start Guide. Zaltbommel-Netherlands, Netherlands, Van Haren Publishing, 2018.
9. "Understanding the maturing role of AI in RPA". (2019, March 27). Retrieved from <https://www.information-age.com/the-maturing-role-of-ai-in-rpa-123481142/>
10. "Predicts 2020: RPA Renaissance Driven by Morphing Offerings and Zeal for Operational Excellence". (2019, December 19). Retrieved from <https://www.gartner.com/en/documents/3976135/predicts-2020-rpa-renaissance-driven-by-morphing-offerin>
11. "Magic Quadrant for Robotic Process Automation Software". (2019 July 8). Retrieved from <https://www.gartner.com/en/documents/3947184/magic-quadrant-for-robotic-process-automation-software>
12. "Peter Parker Principle". (2020 June 23). Retrieved from https://en.wikipedia.org/wiki/With_great_power_comes_great_responsibility
13. "The Value of Robotic Process Automation". (2017 March 1). Retrieved from <https://www.mckinsey.com/industries/financial-services/our-insights/the-value-of-robotic-process-automation#>
14. "Measuring RPA: 10 Performance Metrics for Assessing Robotic Process Automation Benefits". (2019 May 31). Retrieved from <https://www.walklettgroup.com/measuring-rpa-10-performance-metrics-for-assessing-robotic-process-automation-benefits/>
15. Kim, Gene, et al. The DevOps Handbook. Amsterdam-Netherlands, Netherlands, Amsterdam University Press, 2016.
16. "Three Steps for Deploying Robotic Process Automation" (2020 April 17). Retrieved from <https://www.informationweek.com/big-data/ai-machine-learning/3-steps-for-deploying-robotic-process-automation/a/d-id/1337466>
17. "Robotic process automation tech startup UiPath raises \$750M at \$35B valuation" (2021 February 1). Retrieved from <https://www.geekwire.com/2021/robotic-process-automation-tech-startup-uipath-raises-750m-35b-valuation/>
18. "UiPath climbs 23% in stock market debut after one of largest US software IPOs in history" (2021 April 21). Retrieved from <https://www.cnbc.com/2021/04/21/uipath-rises-17percent-in-nyse-debut-after-one-of-top-software-ipos-ever.html>
19. Power Automate UI Builder models and use cases (2020 October 21). Retrieved from <https://docs.microsoft.com/en-us/ai-builder/model-types/>

Slide Deck Art

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Step #1: Pilot

- The pilot stage should include a use case that has big-visible potential to demonstrate value to stakeholders
- The leadership need to be shown hard evidence that RPA will save both time and costs
- Those directly impacted by automation need to be shown the benefits of taking that repetitive and/or error-task out of their hands with an eye towards more value-added activities in their day-to-day responsibilities
- **The successful outcome of the pilot stage is a positive story about RPA with tangible, measurable benefits everyone can celebrate**



Step #2: Adoption

- The team responsible for RPA adoption should target teams who own those candidate tests cases and find potential “automation champions” to support RPA
- The RPA team should adopt a set of standards & practices for RPA workflows and engagement with each team
- **An organization must constantly review existing automation for enhancements and look for new opportunities where there is no active engagement**



Step #3: Expansion

- Baseline data was previously gathered from engaging with various teams
- Focus will be on tasks that can be reused in end-to-end automated flows for providing maximum ROI
- Make the group responsible for RPA a permanent team and not a collection of individuals pulled from multiple teams
- **Document the workflows being automated – not just in the scripts but rather true documentation so the domain knowledge for the organization is not lost once transferred from people to RPA workflows**



Step #4: Enhancement

- RPA training should be considered standard onboarding for certain roles within the organization
- Regular review of existing RPA should be standard practice
- New project initiatives should be screened for candidate RPA tasks
- **Metrics should be collected as part of the automated process so monitoring of status and progress toward new initiatives is easier to track**