Topic 7
Introduction to Robotic Process Automation (RPA)

ST0249 (AIML) AI & MACHINE LEARNING

Learning Outcomes

- Understand Robotic Process Automation (RPA)
  - Understand RPA concepts
  - Apply RPA to data extraction
  - Apply RPA to decision actions

Understanding RPA concepts

What is RPA?

RPA is an easy and simple way to automate the business operations without re-engineering them.

Robotics: Generally, it is a machine/program which imitates the actions of human beings.

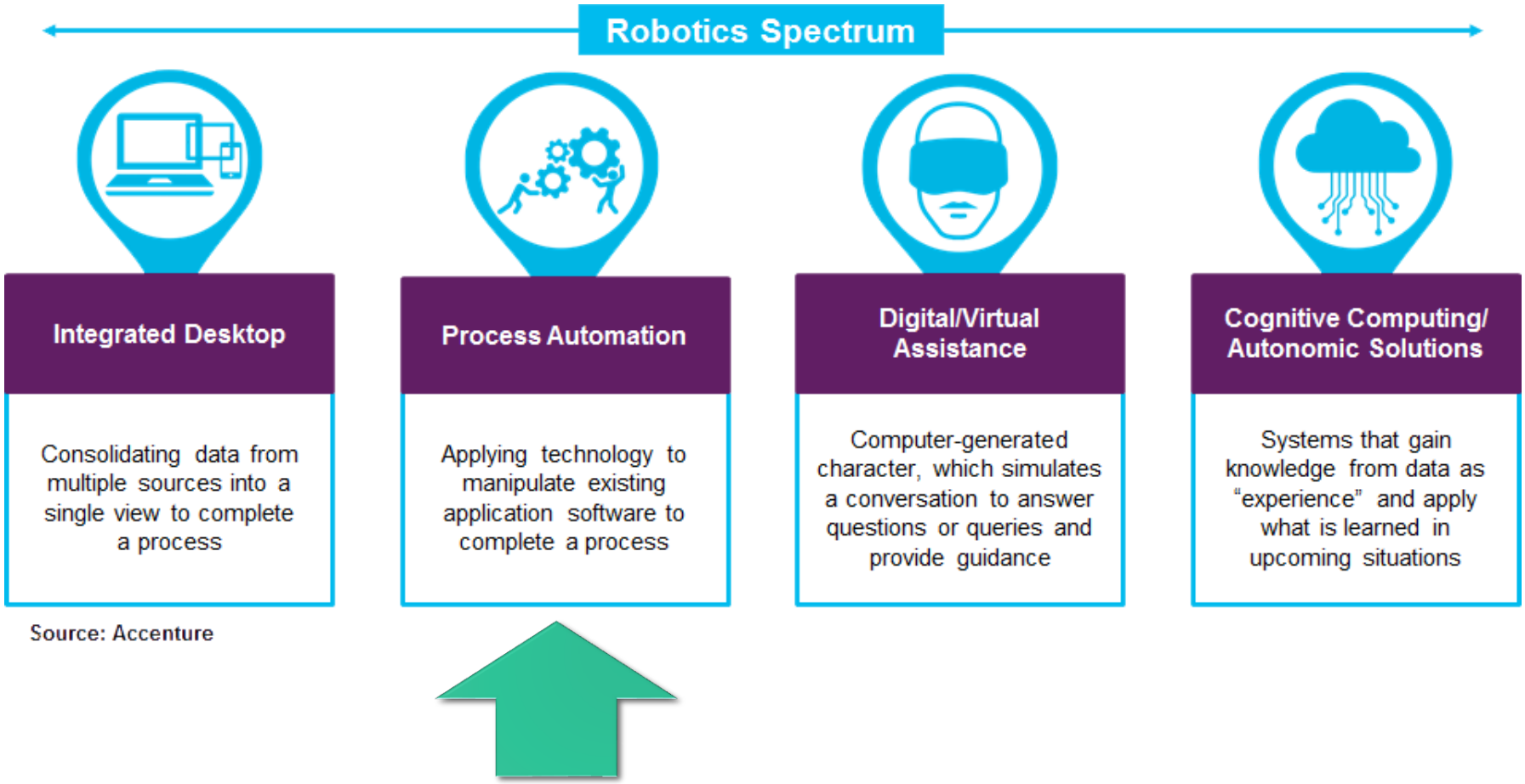
Processes: A process is something that involves a series of steps to perform a meaningful activity. For instance, the step by step process of developing a software.

Automation: Automation can be defined as any process that can be performed by a robot without human interference.

What is RPA?

RPA means a machine that imitates the human actions, which involves a series of steps to perform a meaningful activity without any human involvement. The “robots” involved in the robotic process automation are not actually the robots who carry out the different tasks physically, but they are the software which exists on a computer and intermingles directly with the business applications.

The software robots act in the same way as the people make use of a different application by intimating, in order to automate the routine business processes, for example, gathering and comparing data from different systems or processing of an order. With the help of the RPA, the businesses can automate the prevailing and ongoing business operations, just like a real person who was doing the tasks through the applications.



Source: Accenture

Robotic process automation is:

Configurations that automate manual, repeatable tasks

Algorithms that solve specific problems

Software 'robots' that plug into, and access, existing business software

Workflow enabled interaction

Robotic process automation is:

Configurations that automate manual and repetitive tasks

Virtual 'robots' that integrate with existing software

Replication of desktop actions

Driven by simple rules and business logic

Robotic process automation is not:

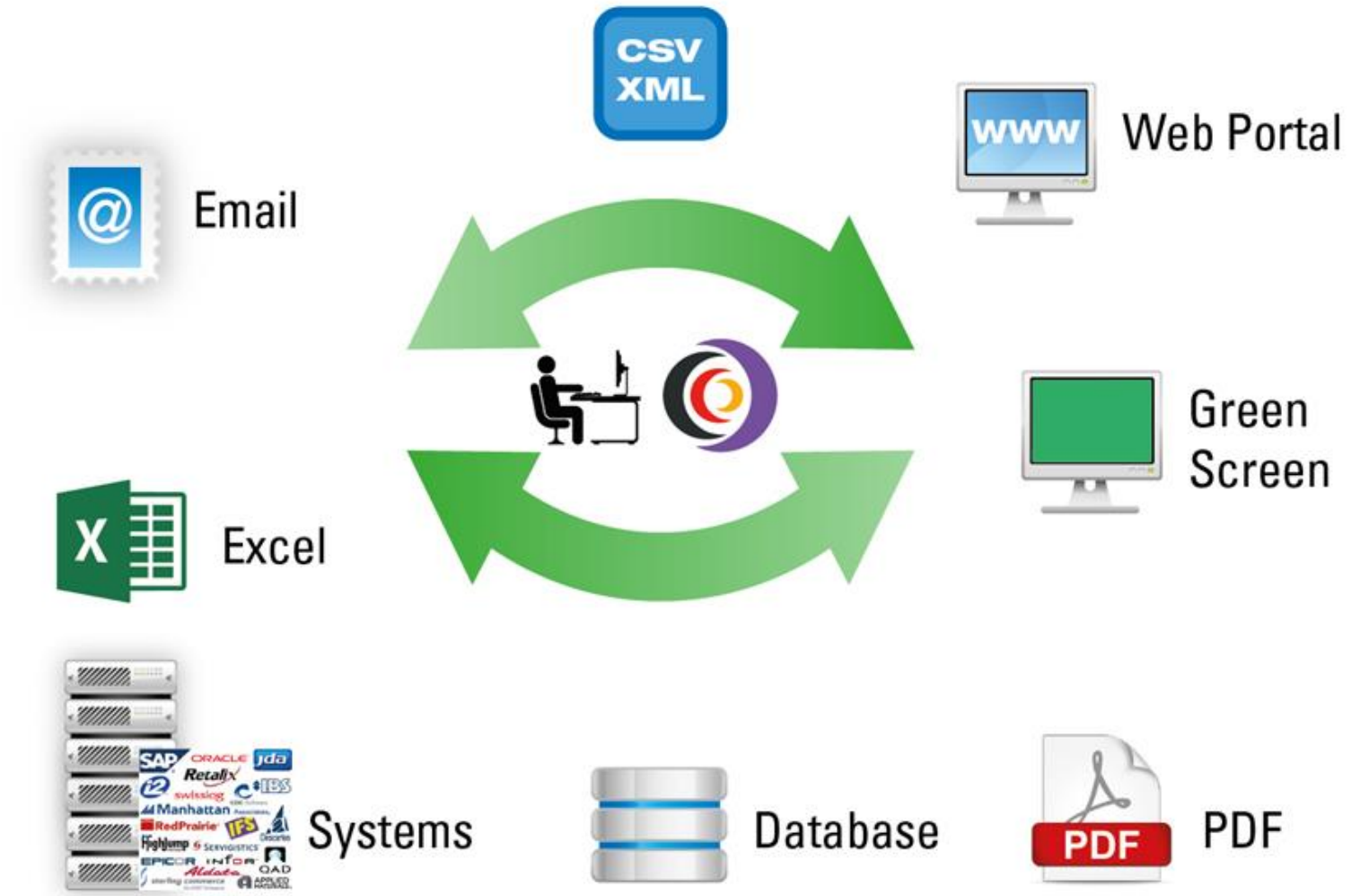
A humanoid robot

Something that can entirely replace humans

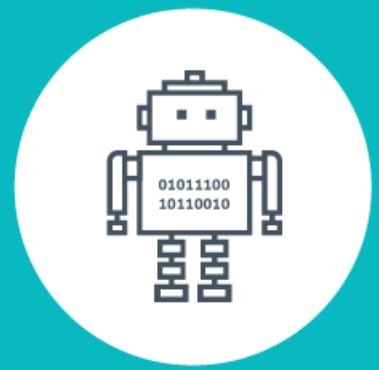
Something that replicates human cognitive functions... yet

Purely just another cost player

Automating Any Business Activity Involving Users, Data, and Systems



Benefits of
Robotic Process Automation



Accuracy

Extreme accuracy and uniformity – much less prone to error or typos

Improved Employee Morale

Workers can dedicate more time to engaging, interesting work

Low Technical Barrier

No programming skills necessary to configure a bot

Productivity

Process cycles times are much faster compared to manual process approaches

Compliance

Bots follow regulatory compliance rules to a tee and provide an audit trail history

Reliability

Bots tirelessly work 24/7 without interruption

Non-Invasive Technology

No disruption to underlying legacy systems, reducing the burden on IT

Consistency

Routine tasks are performed the same way each and every time

What processes are relevant to RPA?

RPA is a versatile, scalable technology that can apply to many different departments and industry **processes**.

RPA technology is particularly applicable to processes that typically are:

- Consistent and routine
- High volume
- Prone to human error
- Limited in requiring a person to make a decision
- Manual data entry

Common business processes where RPA can be applied

- Payroll
- Employee status changes
- New hire recruitment and onboarding
- Accounts receivable and accounts payable
- Invoice processing
- Inventory management
- Report creation
- Software installations
- Data migration
- Vendor onboarding

Business Processes in which RPA can be used

Take over repetitive tasks that employees carry out **50-60** times a day

Periodic reporting, data entry and **data analysis**

Mass email generation, archiving, extracting

Conversion of data formats and graphics

ERP transactions

Process lists and **file storage**

Components of RPA

The RPA products generally consist of three basic components: a set of developer tool, a robot controller and the software robots. Now let us see the functions of each of these components.

Components of RPA

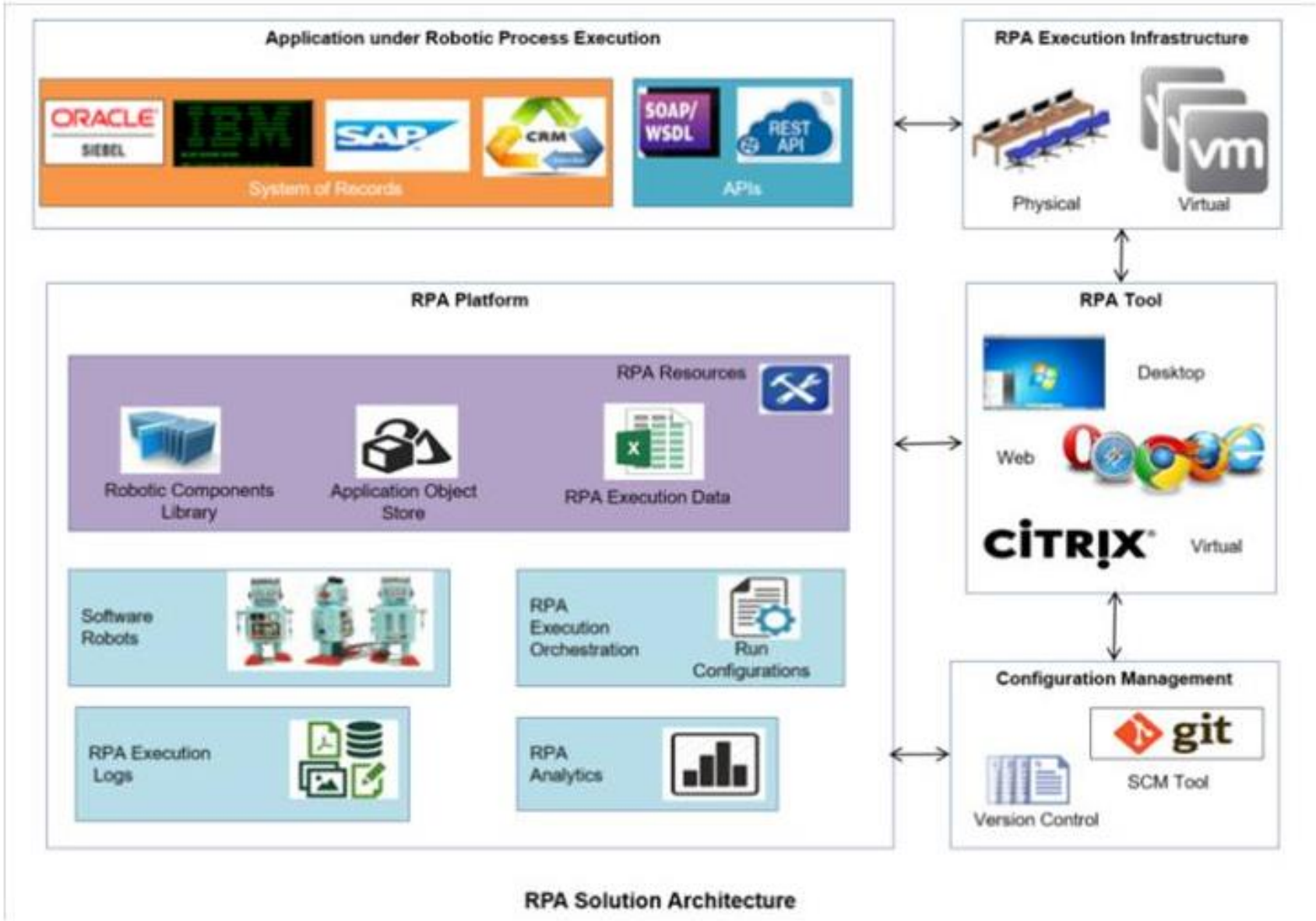
The developer tools are mainly used to determine the tasks related to the robot, it consists of the series of guidelines which a robot has to follow, to carry out the business processes. The detailed guidelines include the business policies or conditional logic statement, for example the if and then decisions. It also offers the features, like the drag and drop functionality and basic setup wizards, so that the users can use them without any knowledge of the coding. But the developer tools are not quite simple like creating the “macros”. When it is used, the user should handle the exceptions and the errors, due to which an obstruction may occur in the automated process. Some of the developer tools also consist of a “process recorder”, using which the definition of a particular process can be increased by catching a series of user activities. There are many other features supported by these tools, such as an interactive diagram, through which the complex visualizing processes are made easier. The developer tools are not needed for executing the processes, rather than they are used only in modelling and altering the processes.

Components of RPA

There are three important roles which are handled by the robot controller. The robot controller enables version control, by allocating as a master repository for determining tasks. It stores the authorizations and credentials for the enterprise application securely and delivers them to the robots in an encrypted format. The next role of the robot controller tool is to allocate the suitable permissions and roles to the users, offer controls and workflows to manage the various processes, like creating, testing, reviewing, updating, approving and deploying tasks to the robot's staff. And finally, it allocates tasks to only one or a clustered robot, and also observes and reports on their various actions.

Components of RPA

The software robots which are also known as “clients” or “agents” perform instructions and interacts with the enterprise applications in order to carry out the transactions. A robot is able to carry out a list of activities that can expand over six-hundred in some products and also the extra activities can frequently custom-coded. Some of the robots keep the detailed record of their activities and results for acquiescence review purposes, and also to help companies to recognize the extra process enhancement opportunities. The software robot acts, activates, obtain and compare results and can communicate with the other system like a human being. They are able to carry out various tasks repetitively, without any mistake and fatigue. It is possible to improve the consistency through various industries and organizations as RPA provides profits to them.



RPA Solution Architecture

Robotic Process Automation

LAYERED DESIGN

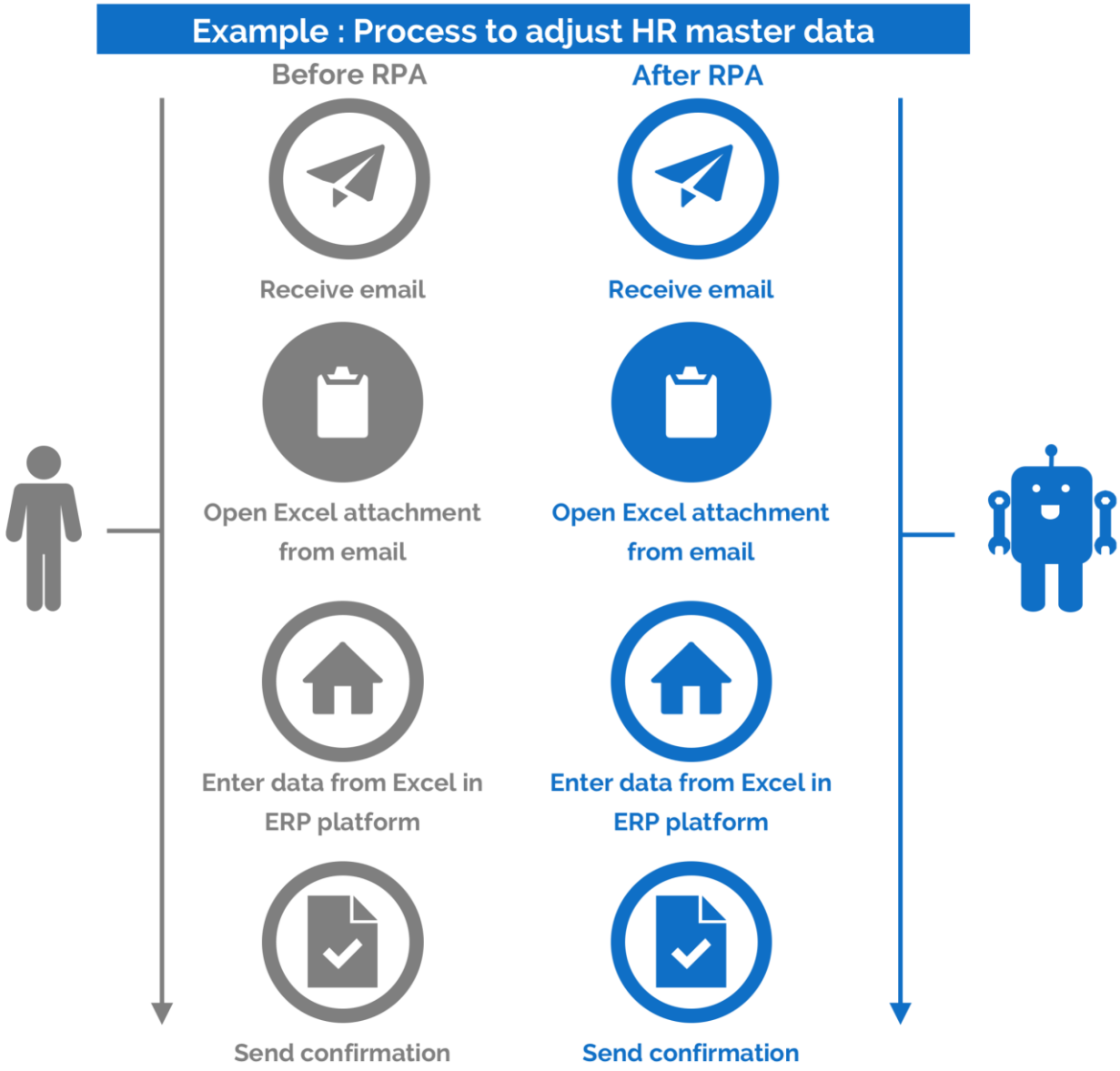
LAYER	PURPOSE	BENEFIT
	• Business rules • Hand-off point • Prioritization if not in management console	• Focus on business rules without needing to create links • Simplify changes

	• Reusable business logic
	  • Identify
	  • Verification
	  • Reconciliation
		• Reusability
		• Avoid multiple changes in processes when logic/business rules change

	• Procedures for performing specific tasks • E.g. Log on, enter address	• Reusability within systems • Development does not require business rule understanding

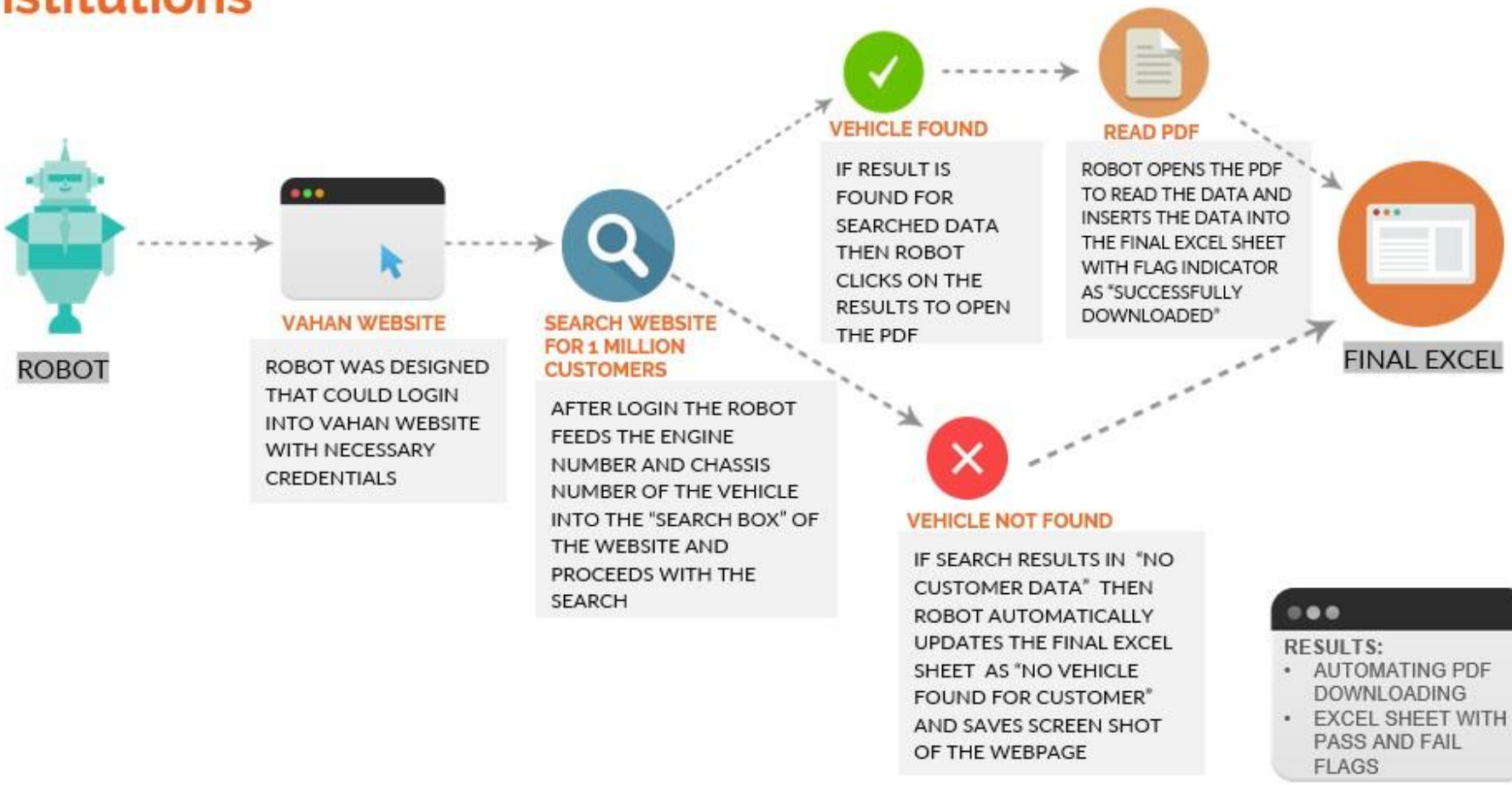
	• Individual screen interactions
	  • E.g. Enter address in Line 1
		• Lower risk, faster changes
		  • Target application integration can be changed without a risk of changing business rules

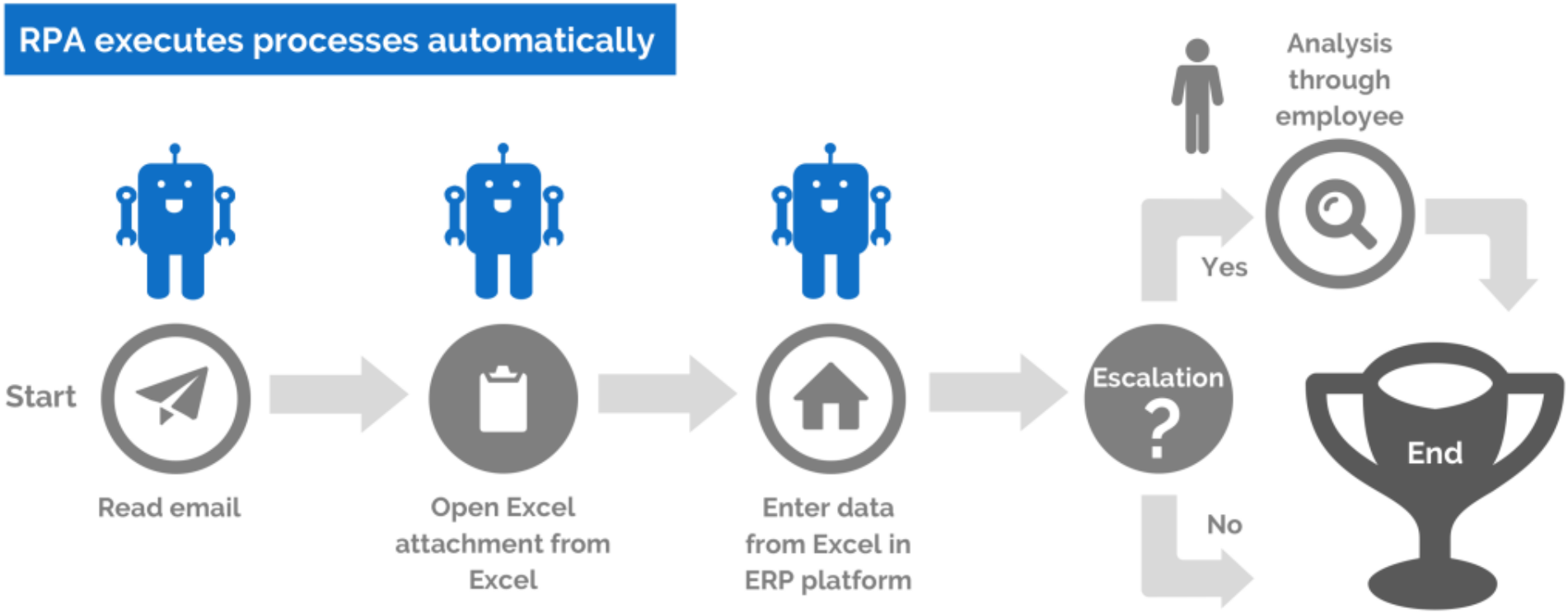
Data extraction

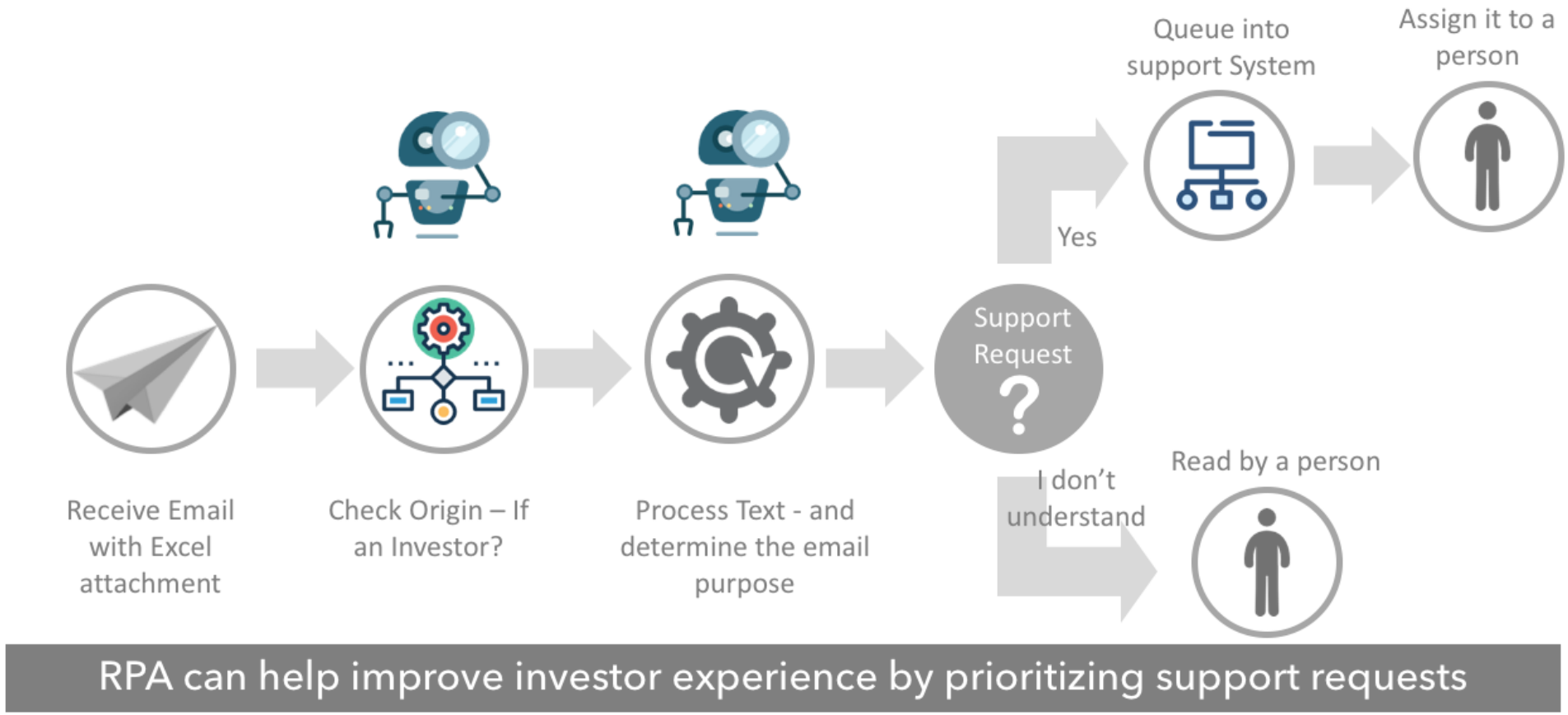

Example : Process to adjust HR master data
Before RPA
After RPA
Receive email
Receive email
Open Excel attachment from email
Open Excel attachment from email
Enter data from Excel in ERP platform
Enter data from Excel in ERP platform
Send confirmation
Send confirmation

Decision actions

RPA for Banking & Financial Institutions



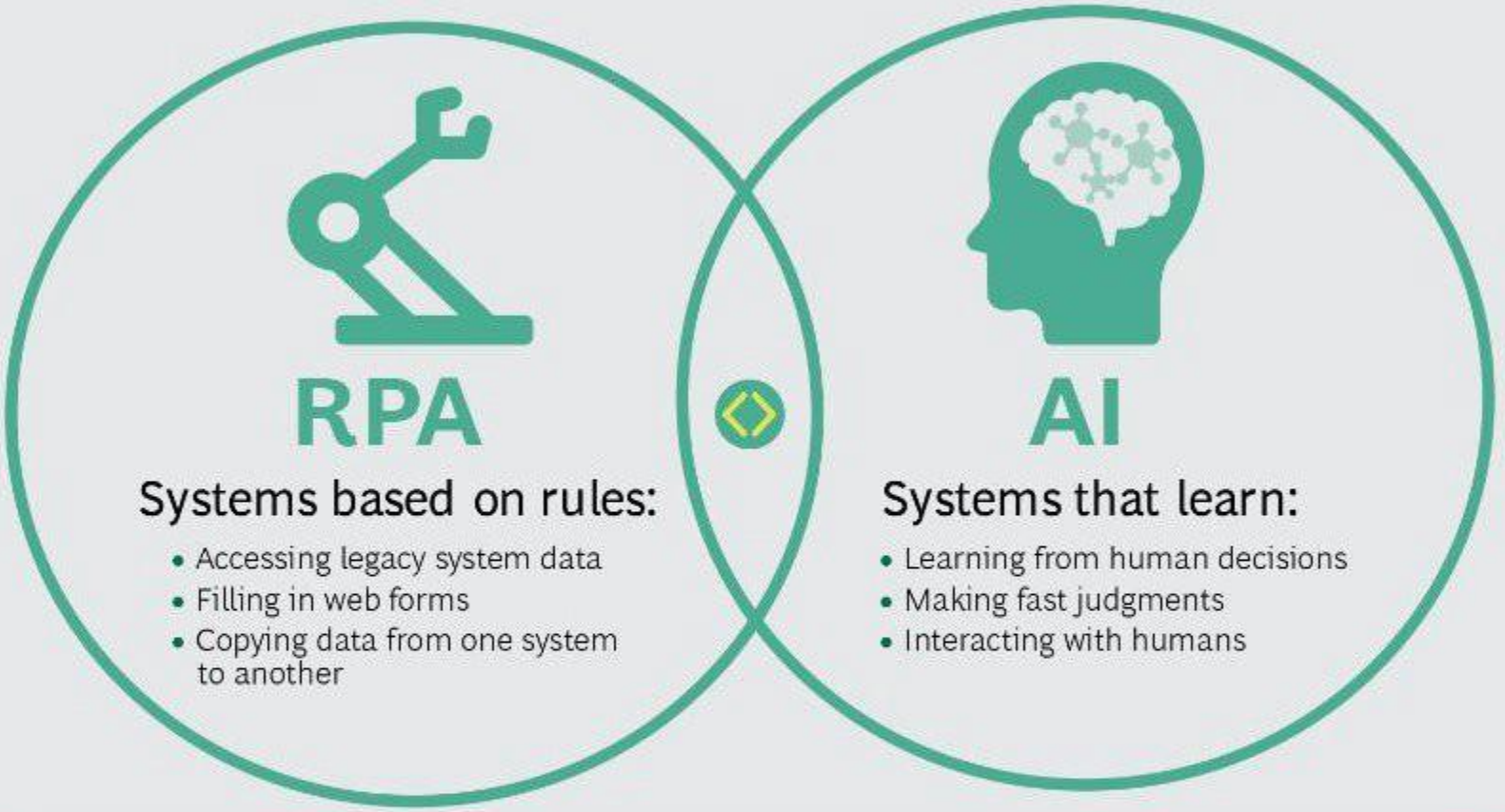

RPA executes processes automatically
Start
Read email
Open Excel attachment from Excel
Enter data from Excel in ERP platform
Escalation ?
Yes
No
Analysis through employee
End



RPA can help improve investor experience by prioritizing support requests

RPA & AI

EXHIBIT 1 | RPA and AI: The Brawn and Brains of Process Automation



Bots automate easy tasks and make broad data sources accessible to AI.

AI learns to mimic and improve processes based on data handed over from RPA.

Source: BCG analysis.

Summary

What we have learnt

- Understand RPA concepts
- Application of RPA to data extraction
- Application of RPA to decision actions