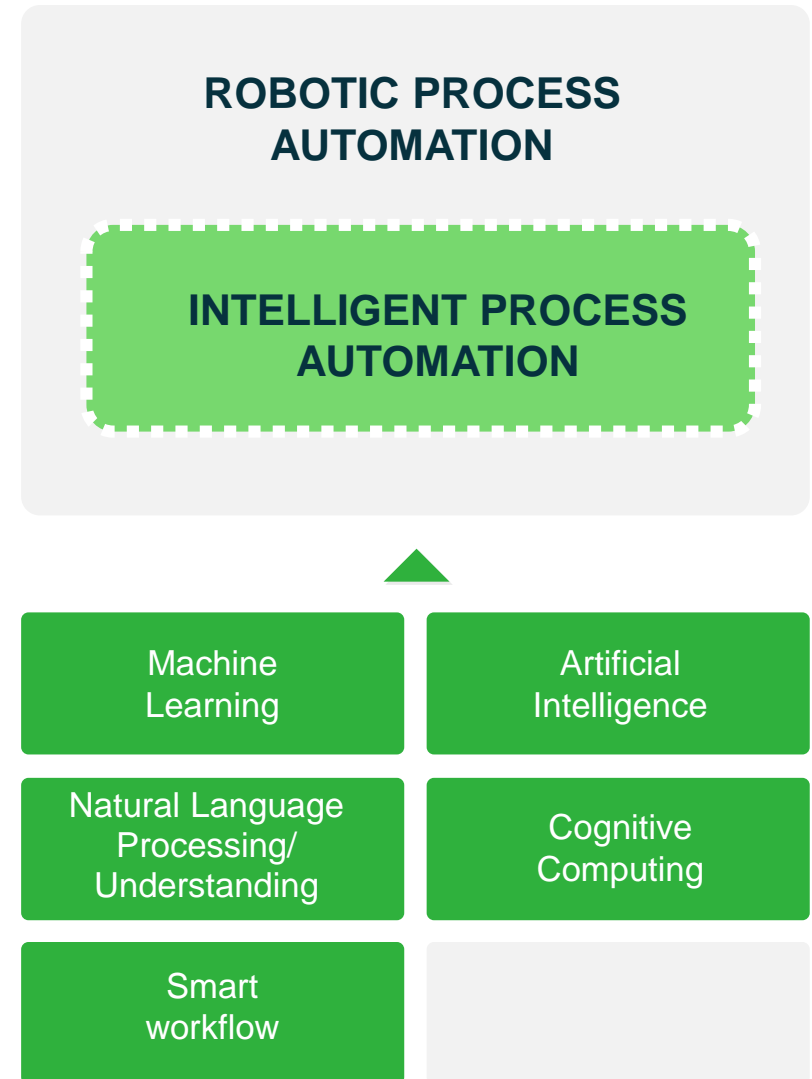# DATA ROBOTICS

REPLY

DATA ROBOTICS

WHAT DATA ROBOTICS MEANS

DATA ROBOTICS DEFINITION

- **Data Robotics** is defined as:
  set of technologies, techniques and applications necessary to design and implement a new level of process automation based on self-learning technologies and Artificial Intelligence (AI), aimed to improve productivity and efficiency in business processes

- In details, Data Robotics' reference framework includes both the so called **Robotic Process Automation (RPA)** tools and the **Intelligent Process Automation (IPA)**

- IPA is an RPA strengthen by "smart" technologies, moving from solutions to solve regular and recurring tasks to new paradigms based on a machine learning approach, enabling Data Robots to develop new knowledge, make decisions, provide judgements and feedbacks: **it takes the robot out of the human**

ROBOTIC PROCESS AUTOMATION

INTELLIGENT PROCESS AUTOMATION

Machine Learning	Artificial Intelligence
Natural Language Processing/ Understanding	Cognitive Computing
Smart workflow	

MYTHS AND MISCONCEPTIONS

The Data Robotics field is not immune to the trend effect, which has incentivized experiments and implementations that were ineffective and have led to the development of some clichés

✖ *All the office work can be automated by RPA*

✖ *RPA is primarily useful to cut operational costs*

✖ *Robots will eventually replace the majority of my employees*

✖ *RPA can be implemented without the support and involvement of the CIO organization*

✖ *RPA is now the silver bullet for optimizing my administrative and operational organization*

✖ *Automation Is "too Expensive"*

✖ *Automation is not as reliable and accurate*

✖ *It is better to work with what you have than to automate*

✖ *We've already completed automation*

✖ *My IT infrastructure is too complex to be automated*

✖ *Inputting knowledge will take too long*

✖ *Security and risk management will be compromised*

no room for RUMORS

MARKET VIEW – CLOSE ATTENTION TO THE SUBJECT

NEW OPPORTUNITIES COMING FROM TECHNOLOGIES

- Automation, now going beyond routine manufacturing activities, has the potential to transform also **activities which involve a substantial share of knowledge work** (*Source: McKinsey & Company*)
- **By 2017** managed services offerings leveraging autonomics and cognitive platforms will permanently remove head count, resulting in a **60% reduction in the cost of services** (*Source: Gartner*)
- **By 2018** the **total cost of ownership for business operations will be reduced by 30%** through smart machines and industrialized service (*Source: Gartner*)

BIG EXPECTATIONS

- More than 50% of IT, Human Resources , Finance manager interviewed stated that they believed **AI solutions would be implemented within 0-2 years in their organizations** (*Source: RPA & Artificial Intelligence Summit 2016*)
- **Amazon, Google, IBM and Microsoft established a partnership about AI**. The goal is to define standards about ethics and privacy in order to engage public opinions on these topics

MARKET VIEW – LESSONS LEARNED

WHICH PROCESSES TO AUTOMATE?

- Start with the **areas which are more the most labor intensive** and involve **repetitive works**
- Do not try to automatize the process end-to-end, but start from **specific steps of the process or sub-processes** in order to maximize the results

THE HUMAN'S ROLE

- **While automation will affect portions of almost all jobs to a greater or lesser degree, it will eliminate very few occupations** entirely in the next decade (*Source: McKinsey & Company*)
- The so-called **labor arbitrage strategy**, which was more about cutting costs than increase efficiency, worked for many years, but **RPA is making it obsolete** (*Source: McKinsey & Company*)

UNDERSTANDING THE DATA ROBOTICS

Multiple decision making
Multiple data sources
Learning based on statistics
Natural language recognition
Meaning comprehension

Pattern based decisions
Learning based on pattern recognition
Non-structured data
Autonomous learning with human in the loop
Limited decision-making based on provided information

Structured Rules
Workflow
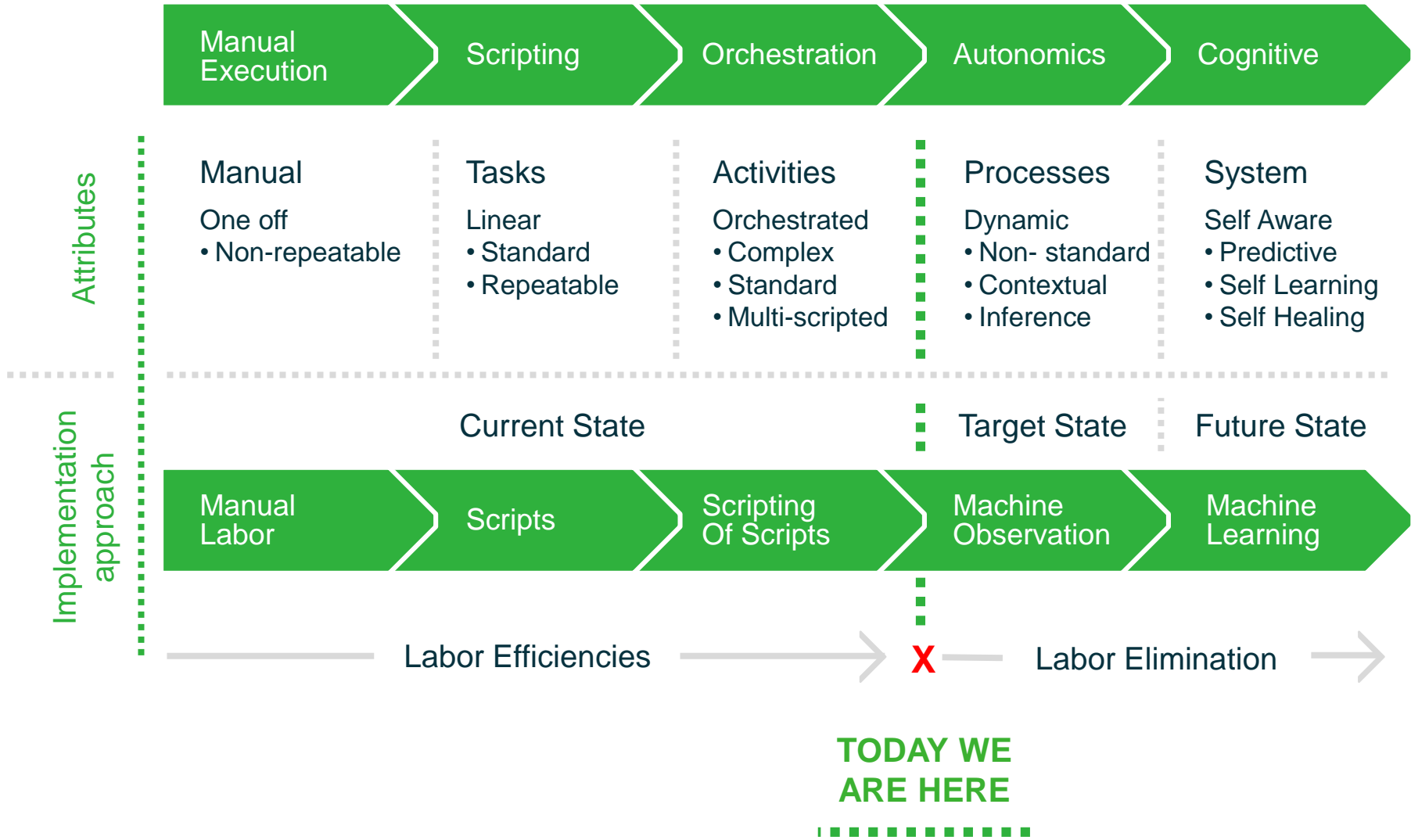Ruled-based
Structured data
No decision-making

Basic Automation / Workflow
Single/Macro application

Multiple decision making

Pa___ ___ed deci___ons

S___ ___ed Rules

Wo___ow

Machine Learning

RPA

Workflow
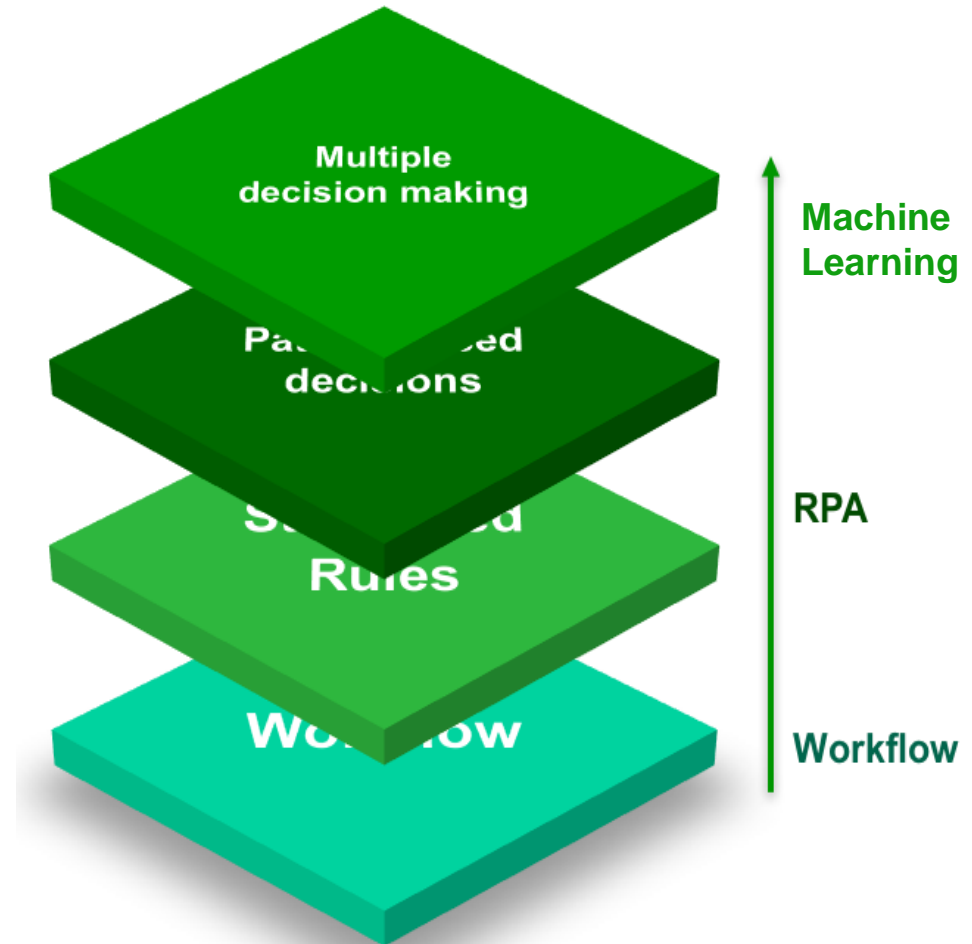
Realizing Data Robotics solutions means working in this scope

FROM LABOR EFFICIENCIES TO LABOR ELIMINATION

Manual Execution	Scripting	Orchestration	Autonomics	Cognitive

Attributes

Manual	Tasks	Activities	Processes	System
One off	Linear	Orchestrated	Dynamic	Self Aware
• Non-repeatable	• Standard	• Complex	• Non- standard	• Predictive
	• Repeatable	• Standard	• Contextual	• Self Learning
		• Multi-scripted	• Inference	• Self Healing

Current State · Target State · Future State

Implementation approach

Manual Labor	Scripts	Scripting Of Scripts	Machine Observation	Machine Learning

Labor Efficiencies → **X** — Labor Elimination →

TODAY WE ARE HERE

MACHINE LEARNING ECOSYSTEM FOR INTELLIGENT PROCESS AUTOMATION

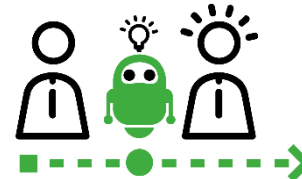## Evolution Path from RPA to IPA

Application

Robotic Process Automation

ML Open Development Platforms
Not standardized > To be developed

ML Software Tools
Partly standardized > To be finalized

ML APIs
Standardized > To be integrated

Intelligent Process Automation

Technology

Automated BOT

Smart BOT

Highlight

The **shift from RPA to IPA** is enabled mainly by Machine Learning capabilities, which can be embedded in software BOTs through:
- dedicated development on a **platform**
- the finalization of pre-existing **tools**
- the integration of structured **APIs**

We started a **scouting of the Machine Learning / Artificial Intelligence ecosystem** to:

- **Identify existing platforms, tools and APIs** that can support the transition from traditional RPA to more advanced IPA solutions

- Assess the capabilities of each platform, tool and API identified to provide a clear and comprehensive ecosystem mapping
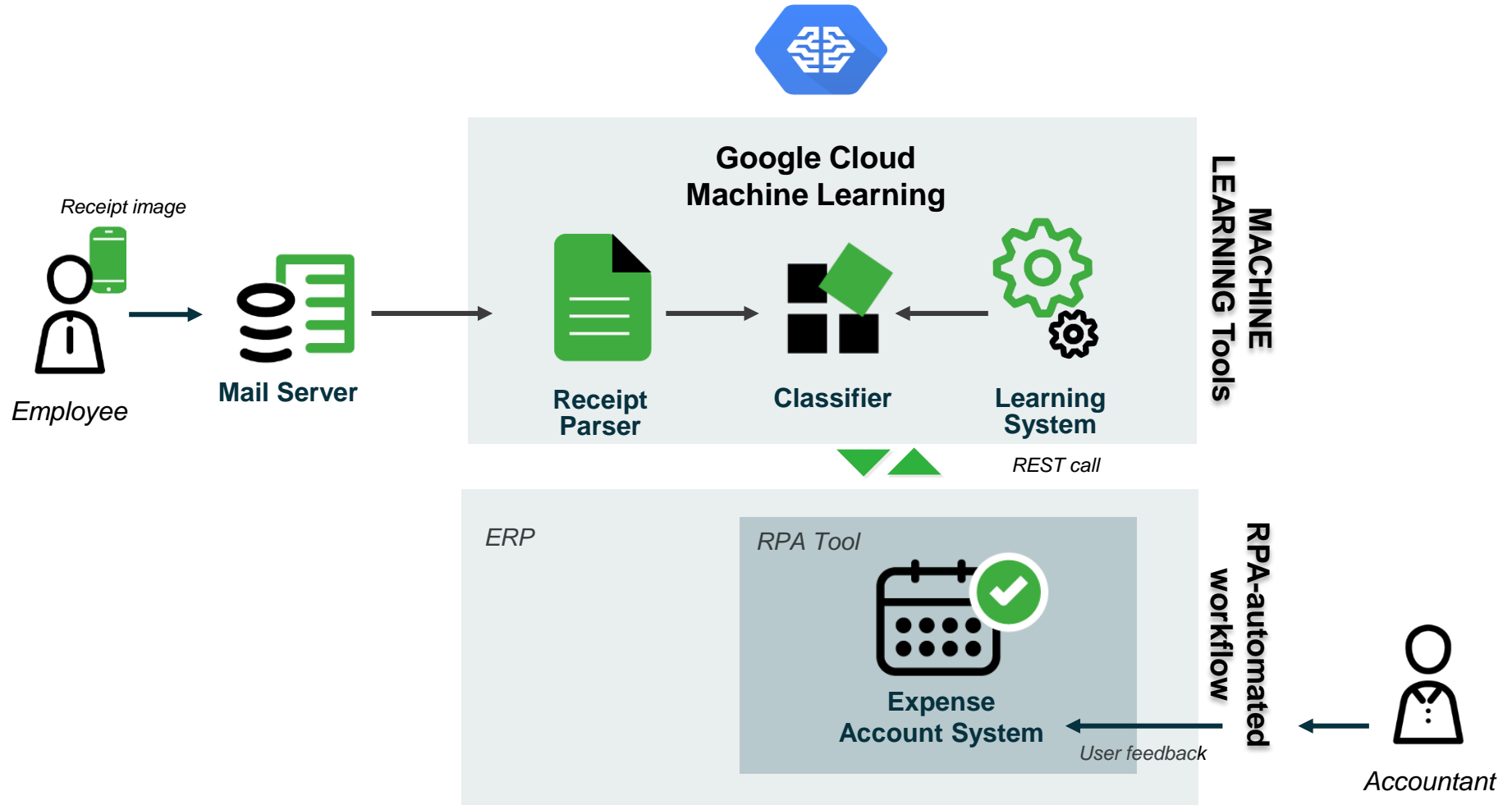
EXAMPLE OF ML TOOLS APPLIED ON BUSINESS CASE

Expenses report reconciliation

CONTINUOUS LEARNING IN MACHINE LEARNING

Data Robot is the result of the training process based on:

- historical data
- continuous refinements of operator / user historical outcome of the taken decisions

The Data Robot training process is a typical "trial & error" iteration

1 **Historical data gathering**
The Data Robot "observes" for a certain period of time (*) the input data and the decision taken by the human user

2 **Algorithm competition**
The 70% of input data and respective decisions caters the Data Robot: the algorithm that best fits the decisions taken by the human is chosen

3 **Test accuracy**
The remaining 30% of input data are used by the chosen algorithm to take the decisions; if the decisions match the ones taken by the human the algorithm is confirmed, else the input data are coupled with the correct decisions and used to refine the Data Robot algorithm

4 **Continuous learning**
Once the initial training is completed, the new input data are processed by the Data Robot algorithm that take the decision autonomously and assign a "level of confidence": if too low, the Data Robot asks the human to confirm / modify the decision. In case the Data Robot decision is discarded, it will be used to refine the algorithm as described in the "Test accuracy" step

INITIAL TRAINING

CONTINUOUS LEARNING

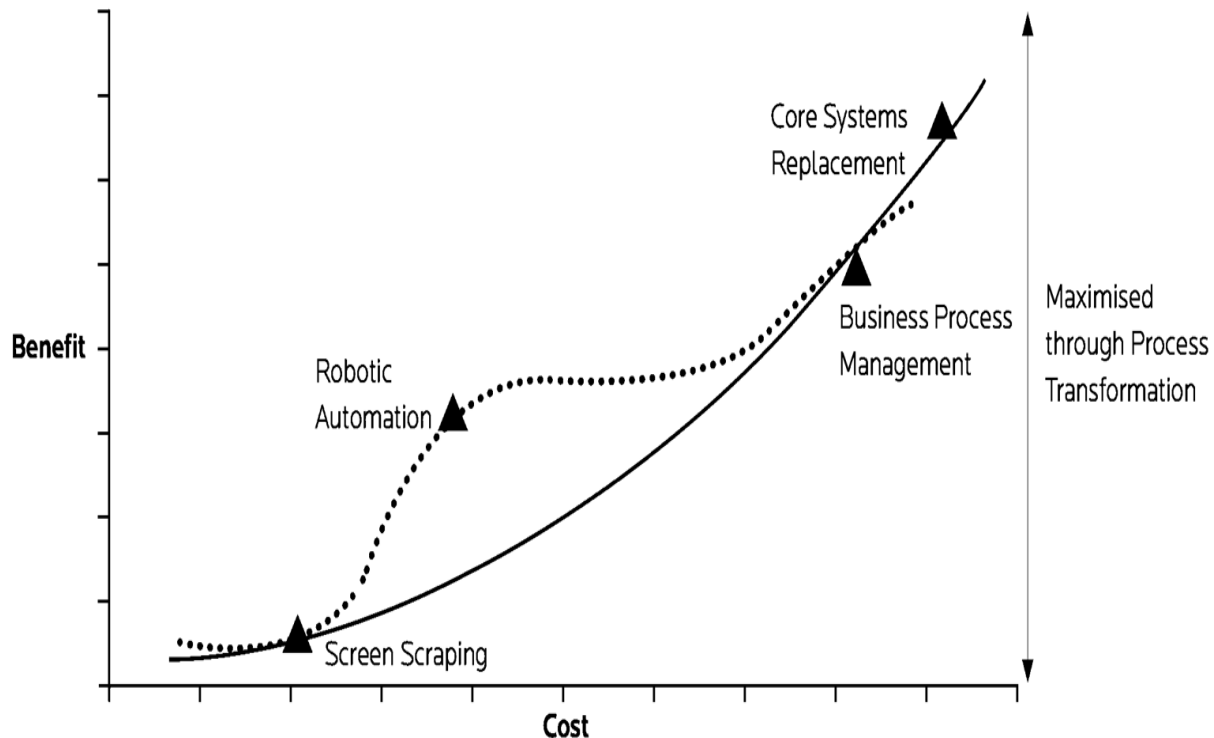*(*) The length of the time period depends on the quantity and quality of the available data*

DATA ROBOTICS

WHERE IS THE VALUE?
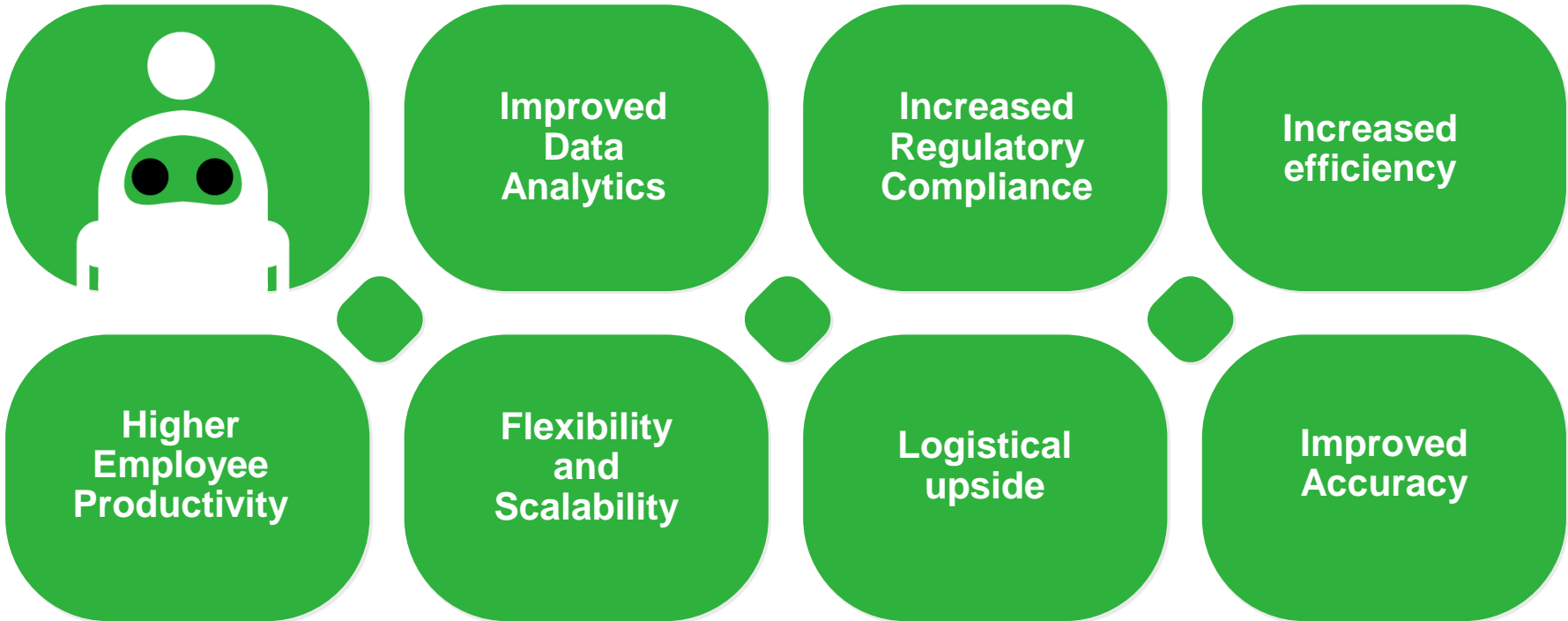
DATA ROBOTICS – A NEW BENEFITS CURVE

Data Robotics offers great possibilities in cost saving, efficiency improvement, control, knowledge management, pushing organizations to revise their business model

Typical Automation Benefits Curve

- Revaluation of the **economics of outsourcing compared with insourcing solutions**, based on RPA and ML

- Data Robotics is emerging as a disruptive technology able to impact heavily **cost saving, efficiency, scalability, control and process compliance**

DATA ROBOTICS VALUE

Improved Data Analytics

Increased Regulatory Compliance

Increased efficiency

Higher Employee Productivity

Flexibility and Scalability

Logistical upside

Improved Accuracy

DATA ROBOTICS VALUE – DETAILS (1/2)

Improved data analytics

- The more data you have the better decision you can take on a micro and macro level
- The more processes are traced the more you can get opportunity to identify optimization gaps and increase efficiency

- To automate means to fully track and document the system automated
- Data Robotics solution provides in depth telemetry about workflow, enabling deep insight to comply with specific regulations

Increased Regulatory Compliance

Increased Efficiency

- Data Robotics solution never needs time off (24/7)
- The same volume of work can be done in less time
- Downstream work commences sooner

- While Data Robotics handle the more repetitive jobs, employees can participate in more value-added activities (personal interaction, problem solving, decision making)
- When employees feel their work is valued and worthwhile, their productivity increases
- In addition employees are better supported for their value-added tasks, increasing productivity again

Higher Employee Productivity

DATA ROBOTICS VALUE – DETAILS (2/2)

Improved accuracy

- Employees are human and all humans make mistakes
- Data Robotics eliminates processing errors if all processes and sub-processes are well mapped
- There will still be need for testing, training and governance of the Data Robot

- Complication with offshore labor are minimized or eliminated (time zone differences, cultural and language barriers, …)
- Decrease the need for employee recruitment and training costs

Logistical upside

Flexibility and Scalability

- Remote management of IT infrastructure to investigate and solve problems for faster process throughput
- Data Robotics makes it easy to maintain a scalable infrastructure, allowing to handle short-term demand without extra-recruiting or training

REPLY
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