Intelligent Process Automation

PwC's view on RPA and beyond

Milan
April 3ʳᵈ, 2019

pwc

1.
Introduction

2.
Beyond RPA

3.
Typical
Implementation
Approach

Introduction

Intelligent Process Automation in a nutshell

Intelligent Process Automation (IPA) involves applying technologies to automate workflows in order to increase productivity and efficiency.

IPA in practice:

Aggregating customer data to improve service

Increasing efficiency while reducing errors

Analyzing processes at scale

Faster operations

85 %
of Banking & Capital Markets CEOs are concerned about the speed of technology change as a threat to their organization's growth

75 %
of CEOs are concerned about the availability of digital skills

44 %
of CEOs say they are clear about how Robotics and AI can improve the customer experience
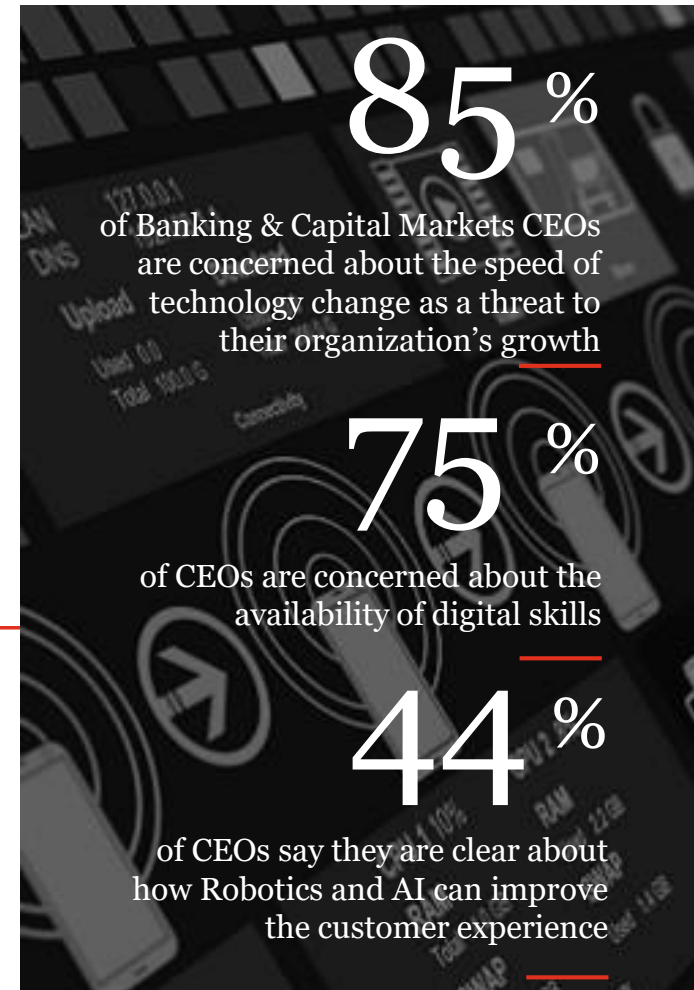
Automation toolkit technologies

In light of specifics automation needs, best practices suggest to combine different automation technologies to achieve better results. Here the main technologies that are used as a "toolking" in Process Automation projects.

Robotic Process Automation	*Dynamic Case Manager*
Smart Document Capturing	*Digital Signature*
Signature presence	*Signature authenticity*
Digital Document Repository	*Natural Language Classification*
Computer vision	*Virtual Agents*
Machine Learning Process Decisioning	*Process Mining*

Computer coded Robots (RPA) mimic the interaction of users and work cross-functional to enable the automation of static processes

Robots are …

Computer coded software
- Non invasive, zero change integration on target system and security

Mimic interactions of users
- Record and automate user interactions
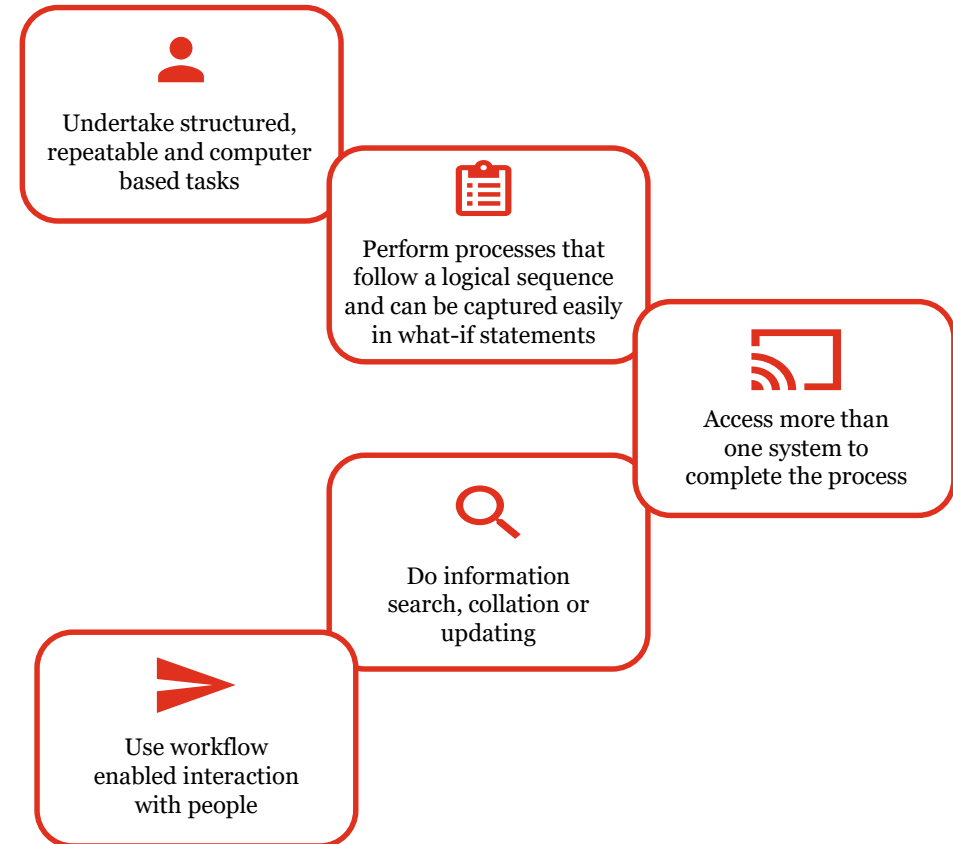- Interact with the user interface (UI) of existing applications

Work cross-functional and cross-applications
- Are entirely a technology agonistic and can be used with any application (e.g. ERP, DB, MS Suite, structured PDF)
- Use a central repository for easy management of automation scrips and processes

Enable the automation of repetitive, rule-based processes
- Build workflows with dynamic decision/branch points and loops for scaling (up/down)

Robotics Process Automation can be used by teams or individuals who:

Undertake structured, repeatable and computer based tasks

Perform processes that follow a logical sequence and can be captured easily in what-if statements

Access more than one system to complete the process

Do information search, collation or updating

Use workflow enabled interaction with people

The difference between BPA, RPA and more advanced automation is that RPA suitable processes are more static and structured

Low Automation

High Automation

43% *of all processes can be automated using* **classic RPA**

Small amount of processes that still need human interaction

static — **dynamic & interactive**

If processes are static and structured it is easy to automate so here RPA will be the ideal solution

Processes that involve complex decisions, a lot of exceptions, are dynamic and more unstructured are not suited for RPA but more advanced automation solutions can help in this case.

Business Process Automation Platforms	Robotic Process Automation (RPA)	Natural Language Processing (NLP)	AI / Cognitive Computing	Algorithmic Business	Human work

# RPA brings huge efficiency gains and operational cost reduction

RPA is experimenting a huge application in the market thanks to its benefits

Reduced costs
Overall operating costs are a fraction of an off-shore FTE

Increased quality
Quality of outputs is increased as chances of error are reduced significantly

Available 24/7
Capable of processing around the clock completing the work that, up, until now, humans have been doing

High scalability
An easily expandable workforce, instantly trained and deployed
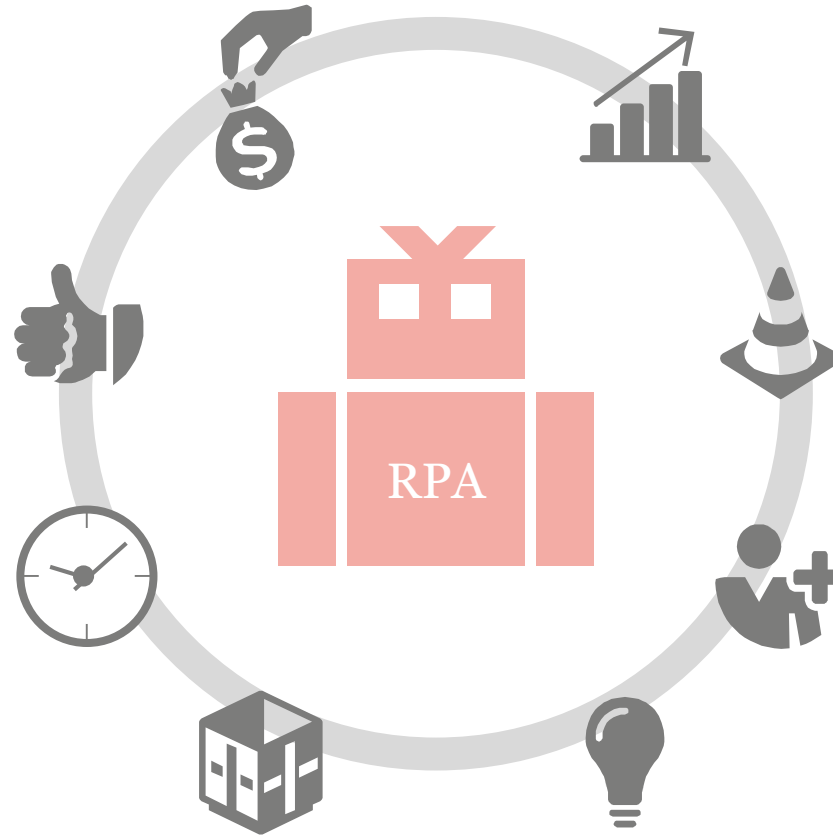
Increased Productivity
Resources can now focus on more value-added tasks as RPA can take up the time-consuming and repetitive tasks

Increased Compliance
RPA tool provides full audit trail of processes performed and are rule-based

Non-invasive Technology
There is no need to change the underlying systems or technology as RPA is deployed on top of the systems and applications

Insights and Analytics
As all activities performed by a RPA tool are captured, visual dashboards can be created to identify areas for improvements

RPA

RPA overview on Italian Financial Services market

Italian Financial Services are widely adopting RPA

RPA is a well-established reality in Italian Financial Services sector, and the results prove that most of the players are experimenting mixed technologies solution instead of pure RPA

90% of respondents at least has planned to start or has already performed activities to evaluate the **potential of automation through RPA**
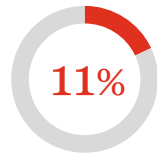
11% of respondents has already **widely adopted** and **implemented automation activities and projects through RPA**

70% of respondents declares that the implemented RPA projects **achieved the objectives set on schedule**
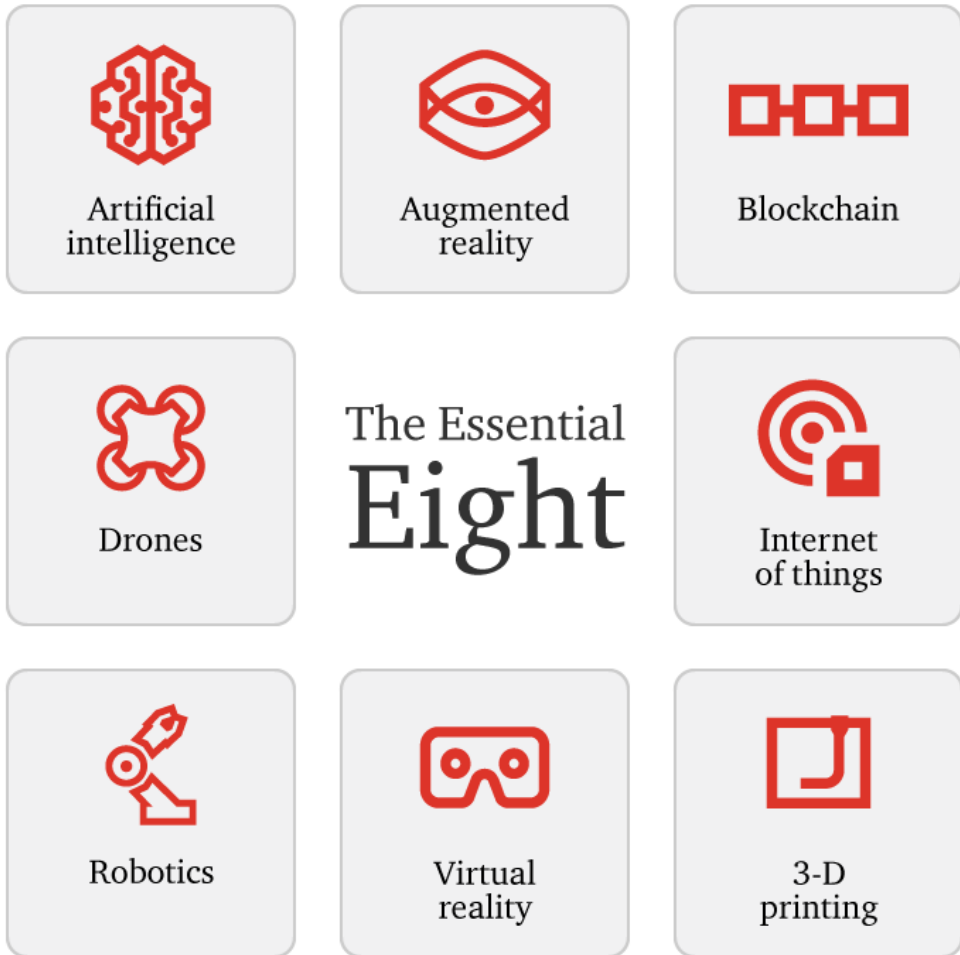
35% **average saving of FTE** declared by the respondents in relation to the **application scope of initiviatives implemented**

Beyond RPA

Disruptive technologies – The Essential Eight

We analyzed 250+ technologies to zero in on the eight having the biggest business impact right now.

Artificial intelligence

Augmented reality

Blockchain

Drones

The Essential Eight

Internet of things

Robotics

Virtual reality

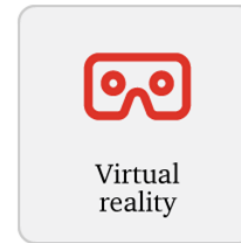3-D printing

Embodied AI

Defined:

A physical IoT-enabled device embedded with AI capabilities, which can perform complex tasks locally.

Why it matters:

From simple cameras to sophisticated drones, embodied AI will be a key contributor to achieving the $15.7 trillion global GDP gains expected from AI, according to PwC's Global AI Study.

Artificial intelligence | Augmented reality | Blockchain
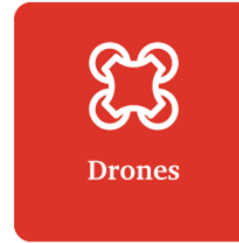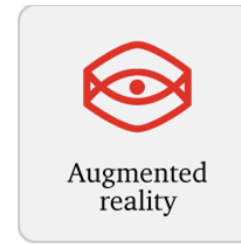
Drones | **Relevant *Essential Eight*** | Internet of things

Robotics | Virtual reality | 3-D printing

Global AI chip market predicted to grow at **49%** compound annual growth rate and reach $18B by 2023.

-*Market Research Future 2018 Market Report*

EXAMPLE

*From analyzing millions of satellite images to finding healthy plant microbiome strains, startups have raised **$500M+** to bring embodied AI to agriculture.*

Automation programs are experimenting a shifting from pure RPA solutions to combine RPA and Artificial Intelligent solutions

AI is approaching or surpassing human abilities to sense, think, and act in complex business environments
AI is defined as "the designing and building of intelligent agents that receive percepts from the environment and take actions that affect that environment." (*)

SENSE

AI is becoming ubiquitous intelligence with the ability to see, hear, speak, smell, feel, understand gestures, interface with your brain, and dream

Natural language

Audio and speech

Machine vision

Navigation

Visualization

THINK

AI is helping us do tasks faster, better and cheaper – Automated Intelligence; helping us make better decisions – Assisted & Augmented Intelligence, or even taking over what we do – Autonomous Intelligence

Knowledge and representation

Planning and Reasoning

Machine Learning

Deep Learning

Simulation and Digital Twins

ACT

AI is equaling or surpassing humans in a number of other tasks – playing games, driving cars, recommendations (movies, books, finance, research) etc.

Robotic process automation

Deep question and answering

Machine translation

Collaborative systems

Adaptive systems

(*) Artificial Intelligence: A Modern Approach Stuart Russell and Peter Norvig (Pearson, 2014)

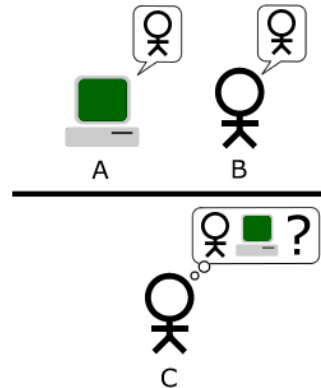# Artificial General Intelligence vs. Artificial Narrow Intelligence

Artificial General Intelligence

Artificial General Intelligence (AGI) is the intelligence of a machine that could successfully perform the full range of human cognitive abilities, like attention, the formation of knowledge, judgment and evaluation, reasoning, problem solving, decision making, etc.

Artificial Narrow Intelligence

Artificial Narrow Intelligence (ANI) is the intelligence of a machine that allows to study or accomplish specific problem solving or reasoning tasks.
In essence, narrow AI works within a very limited context, and can't take on tasks beyond its field.

The Turing test

The "standard interpretation" of the Turing Test, in which player C, the interrogator, is given the task of trying to determine which player – A or B – is a computer and which is a human. The interrogator is limited to using the responses to written questions to make the determination.

Source: Wikipedia

Virtual Assistant

A virtual assistant is a software agent that can perform tasks or services for an individual. Examples of Virtual Assistant are Apple's Siri, Google Assistant, Amazon Alexa, and Microsoft Cortana. Virtual Assistants can also be accessed via online chat: in those cases, they are referred to as Chatbots.

Source: Wikipedia

The three next AI waves

Today

**To early
2020s**

Algorithmic wave

Automation of simple computational tasks and analysis of structured data in areas like finance, information and communications (e.g. RPA and AI combined solutions)
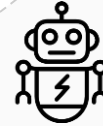
**To late
2020s**

Augmentation wave

Automation of repeatable tasks such as filling in forms, communicating and exchanging information through dynamic technological support, and statistical analysis of unstructured data in semi-controlled environments such as aerial drones and robots in warehouses
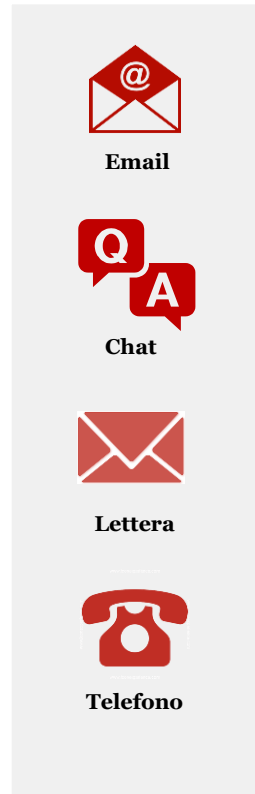
**To mid
2030s**

Autonomy wave

Automation of physical labour and manual dexterity, and problem solving in dynamic real-world situations that require responsive actions, such as in manufacturing and transport (e.g. driverless vehicles)
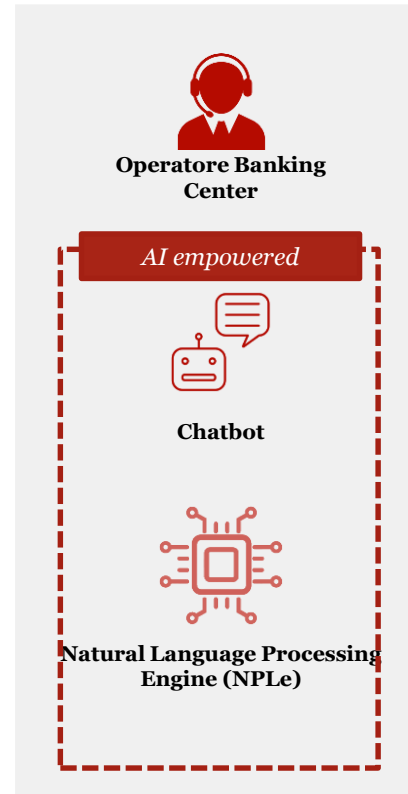
Example of RPA and AI combined solution: Contact Center Automation

Contact channels

Front-offices management

Back-office management

Email

Chat

Lettera

Telefono

Operatore Banking Center

AI empowered

Chatbot

Natural Language Processing Engine (NPLe)

Robotic Process Automation

Operatori desk II e III Livello

User's requests through one of the channels available…

…requests are processed, based on different channels, by an assistant or by an AI empowered solution…
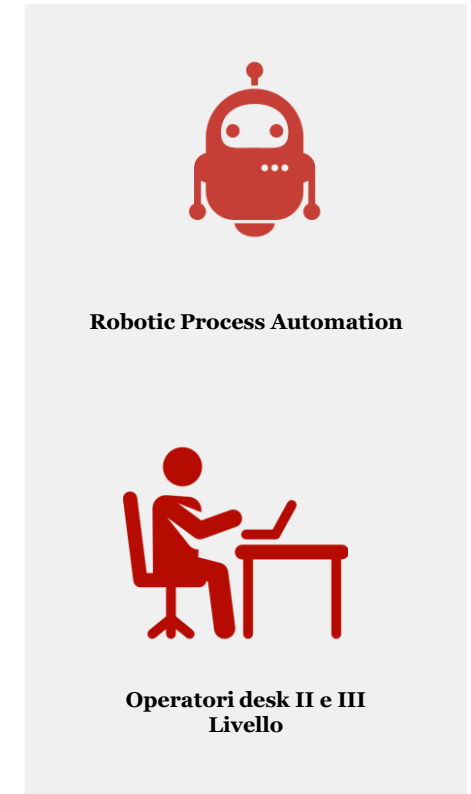
…requests are processed, based on different types, by an RPA solution or by an II or III level assistant…

Typical implementation approach

Typical Intelligent Process Automation program phases

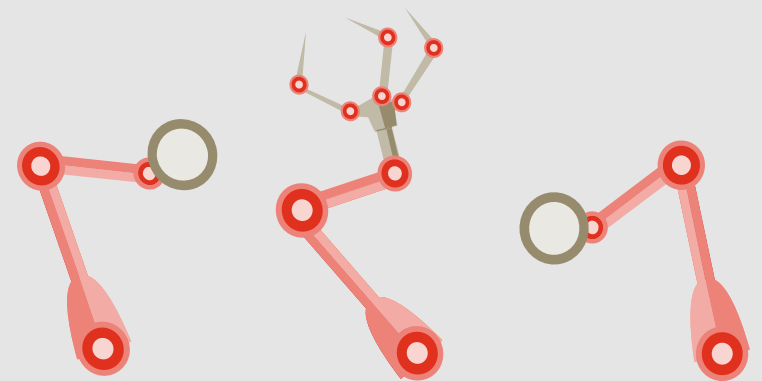*Start small - learn quick - leverage the potential and scale up...*

Scale

Establish

Implementation

Process
Assessment

Proof of Concept

The common challenges in adopting IPA that can help our clients to think ahead and plan

By rushing in and looking for quick savings, firms are trying to solve the wrong problems

- Focusing only on bottom line vs. holistic benefits (e.g., quality, risk, capacity)
- Applying a "band-aid" vs. fixing the process, accelerating up and downstream issues and leaving benefits on the table
- Implementing where underlying systems are under significant transformation, requiring regular updates

By operating in silos, firms miss scale opportunity by learning from mistakes

- Since implementation is relatively easy, many functions and regions implement independently
- On the flip side, some institute centralized control over all initiatives, stifling innovation and experimentation

By endlessly debating approach and governance, firms lose momentum

- On-going debate between IT and operations governance – "Is it an operational tool? A software product"?
- Concern over risk (technology and operational) as well as regulatory control (e.g., audit of 2-eye, 4-eye checks)

A clear understanding of operating models and processes

A consistent method for identifying opportunities

A mechanism for effectively measuring and communicating RoI

A sustainability agenda in which robotics are embedded as BAU

Implementing IPA requires a specific Target Operating Model

Organisation

- Identify **CoE Approach** (centralised, decentralised, hybrid)
- Define a **roadmap** for future automation
- Defining a **IPA strategy** inline with the digitalization strategy of the organization

Governance

- Definition of **tasks**, **responsibilities** and **roles** within the IPA TOM
- Detailing a **release process** during process changes
- Necessary **escalation paths** to secure the implementation process as well as the **operational work**
- **Setting up a reporting** (for example, service including KPIs, implementation status, identification of IPA potentials)

People & Culture

- **Communication plan** to control and ensure information between business analysts, IPA developers and IT
- **Development** of a **stakeholder analysis**
- Establish and anchor the **culture of a continuous improvement process**
- **IPA training concept** diversified to develop roles

Technology

- **Define procedures** for selecting one or more **IPA** providers (longlist, shortlist, evaluation criteria)
- Instruction to **observe the market** to keep up to date with **IPA trends** and developments

Process

- **Implementation process** including the potential analysis, process selection process and implementation
- Definition of **test cycles** and maintenance plan
- **Business Case** Creation
- **Change Request** (CR) Management

Once the robots are live, monitoring is important to maintain and continually improve the bots

Once installed in the digital workforce, continuous monitoring is essential to ensure that the BOTs carry out their specified process efficiently and respond accordingly to any changes.

This stage will include:

Monitor Digital Workforce

Regular and repeated observation of the digital workforce is essential to ensure that it is carrying out it's role at maximum capacity

Maintain Digital Workforce

If and where needed, the digital workforce will require maintenance due to underlying system changes or process changes

Optimise

As your business grows and your internal processes develop, your digital workforce will require optimisation in order to meet expectations

Continuous Improvement

Where the system is seen to be lacking improvements will be identified and made going forward

Identify opportunities for further automation

Thank you!

pwc