Artificial Intelligence/Robotics

Transforming the Financial Services Middle and Back Office Function

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pwc   AUTOMATION ANYWHERE

Biographies

Kevin Kroen, Partner, US Financial Services Digital Labor Leader, PwC

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Kevin is a partner in PwC's Advisory practice, specializing in middle and back office transformation across the Financial Services sector. Kevin leads PwC's Financial Services Digital Labor practice in the US and plays a key role leading our services in robotic and intelligent process automation across all of PWC's financial services sectors (Insurance, Banking and Capital Markets, and Asset Management) and competencies (Finance, Operations, Risk, Compliance, HR, etc.). Kevin has over 18 years of management and technology consulting experience, exclusively in Financial Services.

Kevin has a BS degree from Carnegie Mellon University in Information and Decision Systems. Prior to joining PwC, Kevin worked as a Financial Services consultant for Diamond Management and Technology Consultants and Accenture.

## Edmundo Costa, VP Alliances and Enterprise Accounts, Automation Anywhere

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With deep and broad experience as an entrepreneur and leader at a number of high tech enterprises, Edmundo leads Automation Anywhere's Strategic Partners and Channels in the Americas, guiding the delivery of RPA services into the worlds largest enterprises. Previously, Edmundo co-founded and led virtual security pioneer Catbird, successfully building its Enterprise business, securing institutional funding, and eventual sale. He was the sales leader and member of the Executive Team at both Tarantella and SCO. Edmundo is a dual-degree graduate of Cornell University with a BS in Operations Research and Information Engineering and BA in Economics. He has an MBA from Harvard Business School.

What do we mean by Digital Labor?

RPA is not a physical robot that sits at a desk performing operational processes but a software application that executes programmed tasks
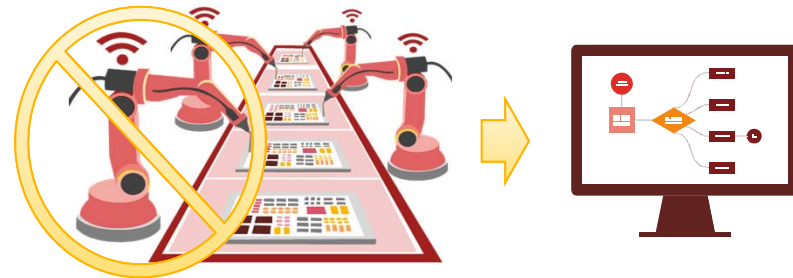
RPA capabilities

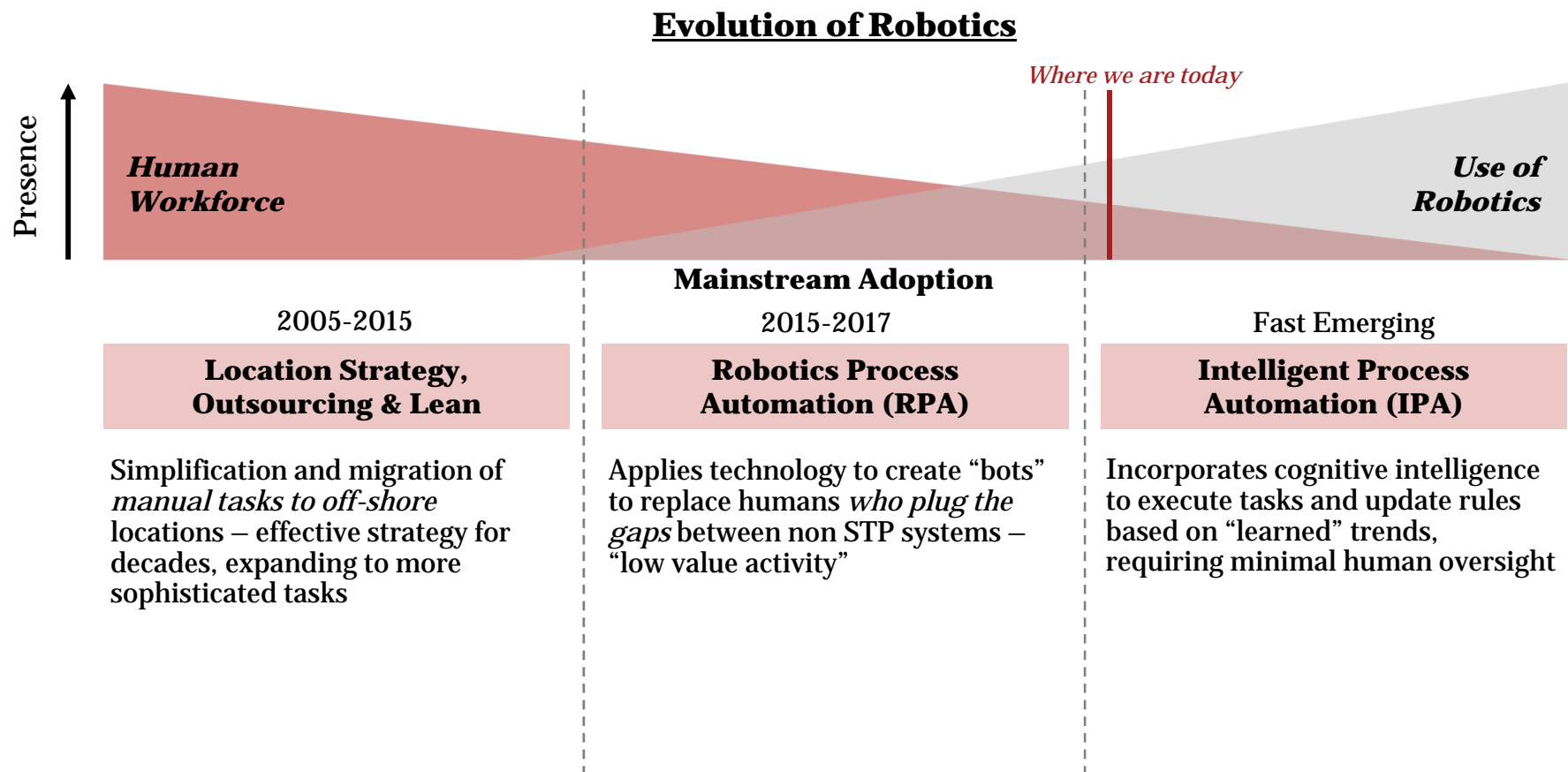| **Data scraping**	**Data entry**	**Rules-based triggers**	**3rd party integrations**	**Document & Data extraction**	**Document image capture**
Scrape from live web pages, systems and documents based on key words	Automated data entry and transfer to testing spreadsheets or applications	Can perform "if-then" actions based on pre-determined rules and can drive workflow	Integration with 3rd party applications to identify characteristics or to transfer data	Can extract documents from image repositories and data files/queries based on file names	OCR functionality with the ability to identify specific fields and words

RPA has changed the way firms can approach automation by significantly reducing the time to code. Machine learning is further changing this paradigm...

RPA in Action

Adoption of Digital Labor within Financial Services

Workforce efficiency and effectiveness have long been a priority. As technology evolves, decades of proven labor arbitrage and shared services are no longer the best approach.

Evolution of Robotics

Where we are today

Presence

Human Workforce

Use of Robotics

Mainstream Adoption

2005-2015	2015-2017	Fast Emerging
Location Strategy, Outsourcing & Lean	**Robotics Process Automation (RPA)**	**Intelligent Process Automation (IPA)**
Simplification and migration of *manual tasks to off-shore* locations – effective strategy for decades, expanding to more sophisticated tasks	Applies technology to create "bots" to replace humans *who plug the gaps* between non STP systems – "low value activity"	Incorporates cognitive intelligence to execute tasks and update rules based on "learned" trends, requiring minimal human oversight

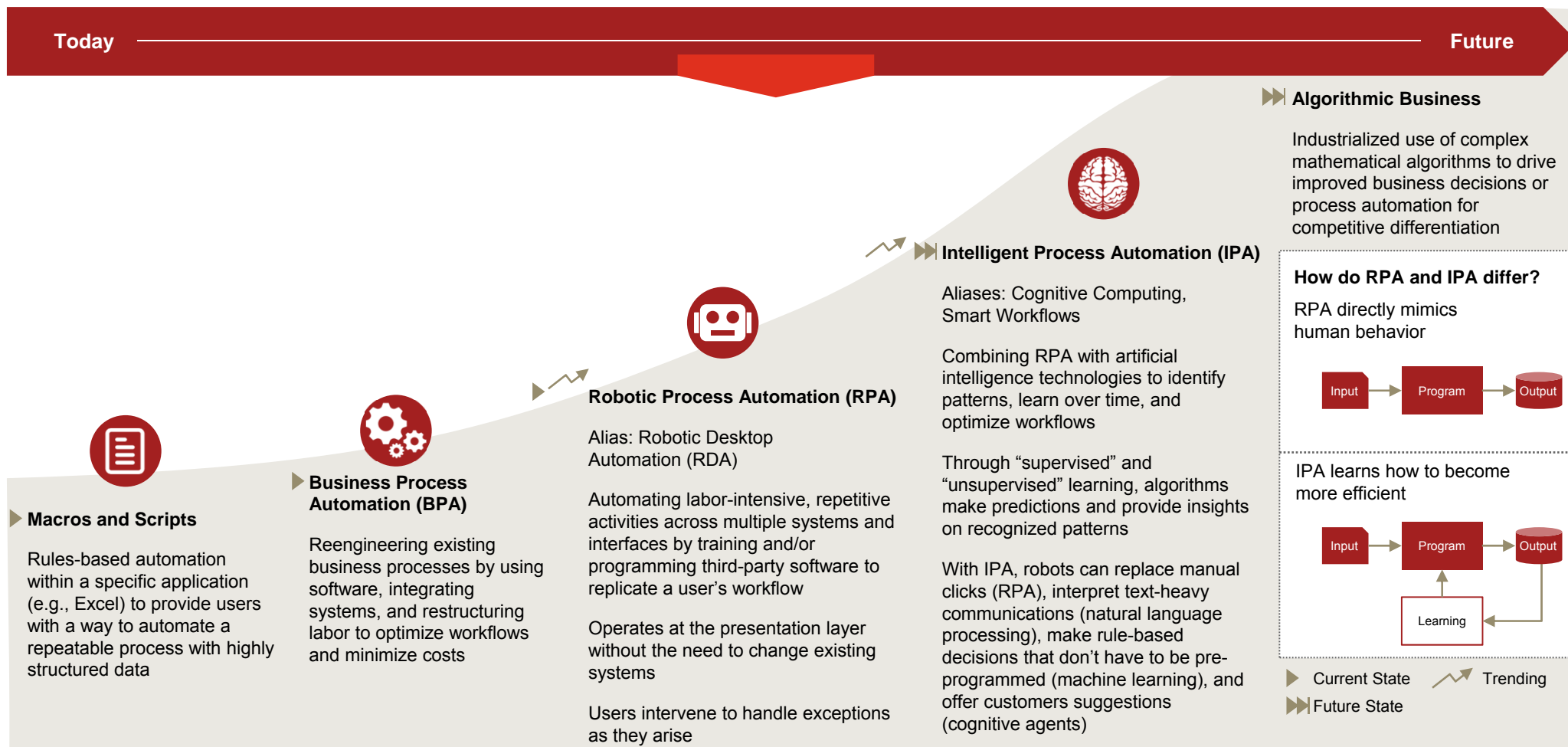# *Digital Labor is a capability enabled by Artificial Intelligence*

Man-Machine Intelligence Continuum

Artificial Intelligence is moving from **automation to augmented intelligence**. *As humans gain trust in AI systems, they might become* **autonomous intelligence**

Automation	Assisted Intelligence	Augmented Intelligence	Autonomous Intelligence
• AI techniques are being used to automate repetitive tasks that include both manual and cognitive aspects • Data on historical human execution of the task and the desired outcome is used to **train the machine to complete the task independently**	• While AI techniques enhance the efficiency of activities across the business value chain, **machines do not dynamically adapt to changing data** • Data scientists, analysts, and researchers continue to work towards either assisting machines in generating the required output or continue to manually perform certain tasks	• AI techniques will be employed by businesses to support a wider set of tasks involving thinking, analysis, and planning • Computational algorithms will begin to adapt to changing data; **machines** will not automatically make decisions, they **will put humans in the best place to make decisions**	• AI techniques will be used by businesses to **automate the decision making process** with the absence of human intervention • Computational algorithms will automatically adapt to changing data; machines will be programmed to continuously learn

Low ━━━━━━━ *Degree of Advancement* ━━━━━━▶ High

In the automation future state, additional value will come from combining rules-based technology with artificial intelligence and a variety of its applications

Today → **Future**

Algorithmic Business

Industrialized use of complex mathematical algorithms to drive improved business decisions or process automation for competitive differentiation

Intelligent Process Automation (IPA)

Aliases: Cognitive Computing, Smart Workflows

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

Through "supervised" and "unsupervised" learning, algorithms make predictions and provide insights on recognized patterns

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)

Robotic Process Automation (RPA)

Alias: Robotic Desktop Automation (RDA)

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

Operates at the presentation layer without the need to change existing systems

Users intervene to handle exceptions as they arise

Business Process Automation (BPA)

Reengineering existing business processes by using software, integrating systems, and restructuring labor to optimize workflows and minimize costs

Macros and Scripts

Rules-based automation within a specific application (e.g., Excel) to provide users with a way to automate a repeatable process with highly structured data

How do RPA and IPA differ?

RPA directly mimics human behavior

Input → Program → Output

IPA learns how to become more efficient

Input → Program → Output
Learning

▶ Current State   Trending
▶▶ Future State

Automation Anywhere Today

By 2020, we will be the world's largest employer with 3m Digital Workers augmenting the global workforce.

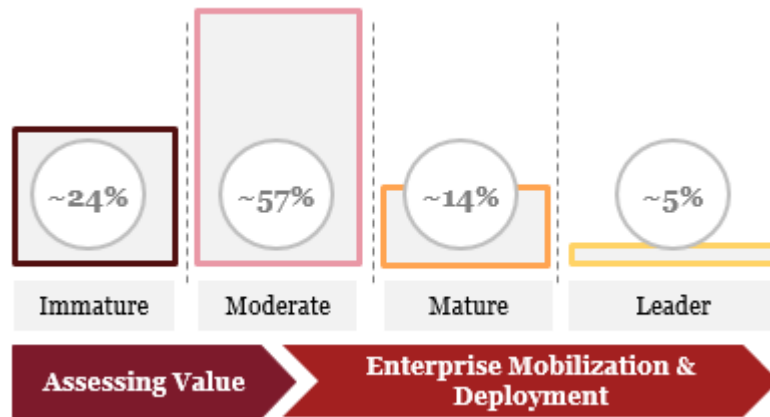| **900+**	**30+**	**20,000+**	**750,000+**	**14+**
Enterprise Customers	Big 4, largest BPO's and SI's are our partners.	People trained on our products	Digital Workforce in production today	Years of innovation and experience

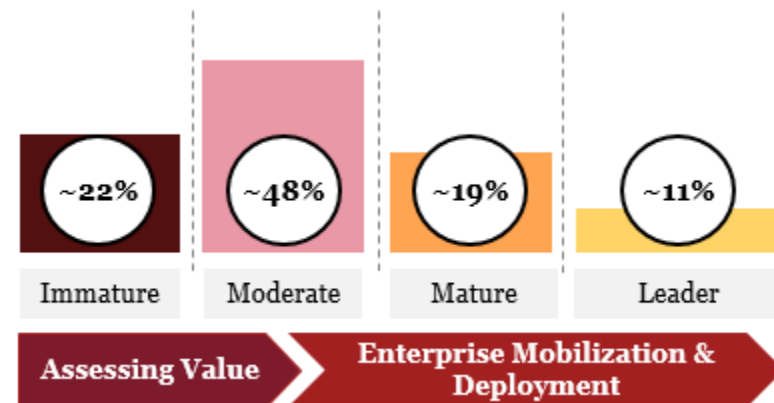# *Where is the Industry?*

Early adopters are moving towards wider mobilization—and are beginning to see a return on investment (ROI) from their programs.

2016

Based on our 2016 survey, approximately **80%** of survey participants were in the early stages of RPA adoption. Most were still in the "Assessing Value" stage

Fast forward to 2017...

The 2017 survey reveals the pervasiveness of RPA technology across the industry. **More than 10% of respondents consider themselves "leading"** in the space, and **19% indicated that they have mature programs**

While 70% are still in the early stages, we believe that this number may reflect new entrants into the space

Over 50% of the 2017 survey respondents view developing a program to support digital labor / RPA as extremely or very important, when compared with other discretionary productivity initiatives

What's Next?

While RPA will continue to have a huge impact in the coming years, the expectation is that financial services firms will lead in the adoption of Intelligent Process Automation (IPA)

IPA is the next step...

The 2017 survey reveals that firms are starting to focus on intelligent process automation and cognitive capabilities. Key findings included:

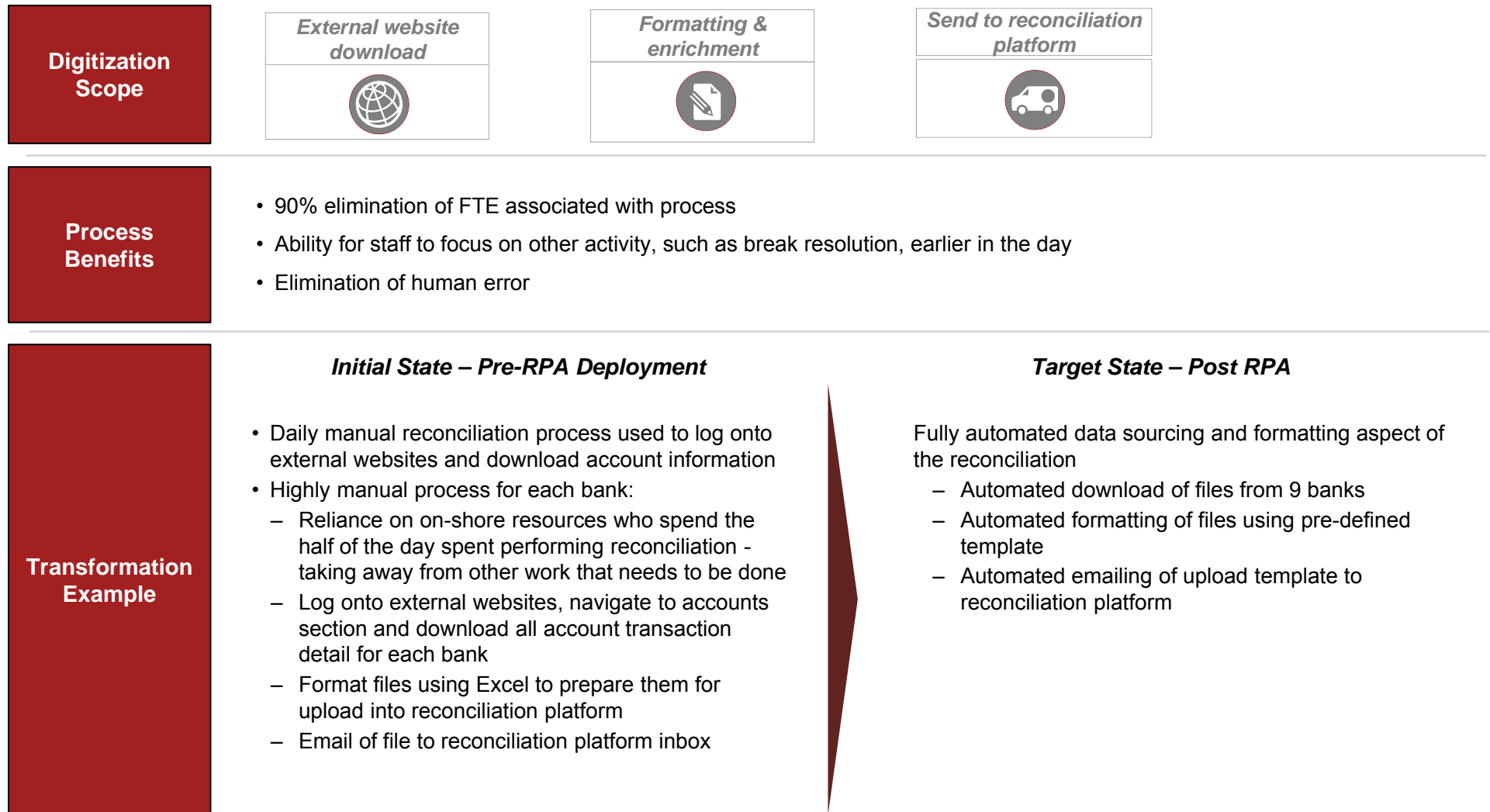- IPA bots in production
- Heavy use case exploration

As IPA gains traction, there are additional questions being posed by clients:

- Managing risk and control of intelligent bots, including regulator view
- Role of user driven development as technology grows in complexity
- IPA definition and maturity of various capabilities

Are you considering or currently using more advanced versions of process automation (i.e., moving IPA)?
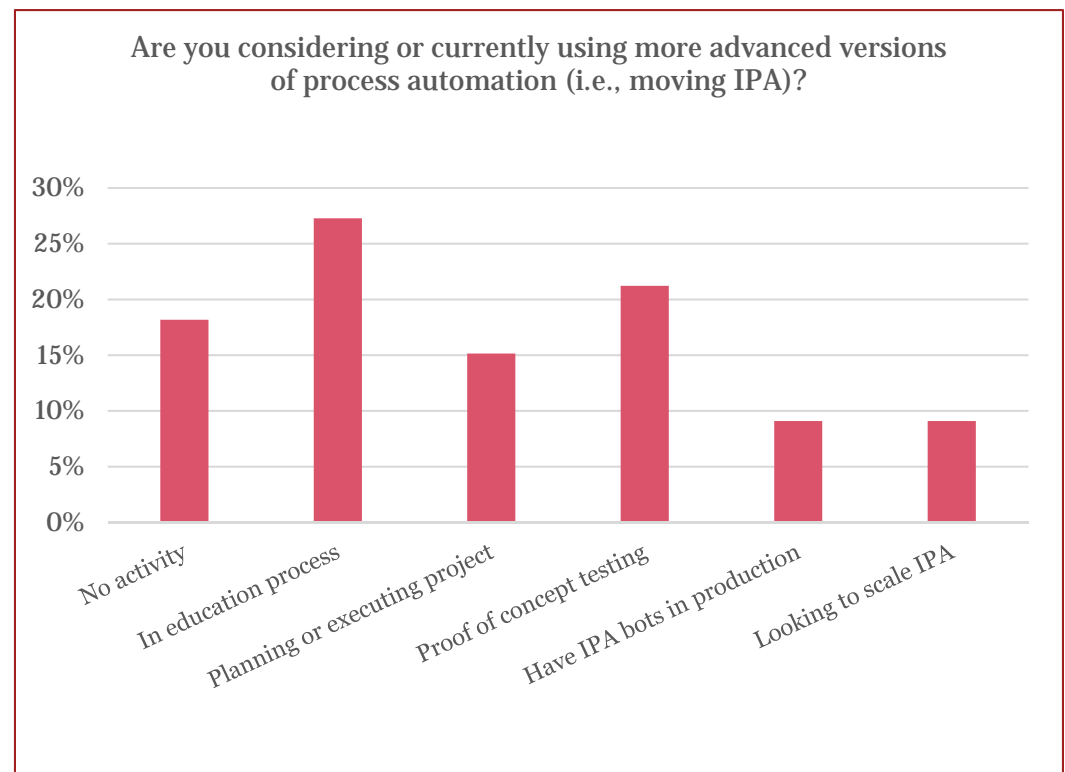
In addition to IPA, we're seeing a bigger push towards a broader orchestration, integrating BPM, OCR, natural language processing, and other technologies, enabling an overall digital back office.

Case Study: Robotic Process Automation (RPA) was used to automate a manual Nostro reconciliation

Digitization Scope

External website download	*Formatting & enrichment*	*Send to reconciliation platform*

Process Benefits

- 90% elimination of FTE associated with process
- Ability for staff to focus on other activity, such as break resolution, earlier in the day
- Elimination of human error

Transformation Example

Initial State – Pre-RPA Deployment

- Daily manual reconciliation process used to log onto external websites and download account information
- Highly manual process for each bank:
  - Reliance on on-shore resources who spend the half of the day spent performing reconciliation - taking away from other work that needs to be done
  - Log onto external websites, navigate to accounts section and download all account transaction detail for each bank
  - Format files using Excel to prepare them for upload into reconciliation platform
  - Email of file to reconciliation platform inbox

Target State – Post RPA

Fully automated data sourcing and formatting aspect of the reconciliation
  - Automated download of files from 9 banks
  - Automated formatting of files using pre-defined template
  - Automated emailing of upload template to reconciliation platform

Case Study: Software Industry: Finance and Accounting Shared Services
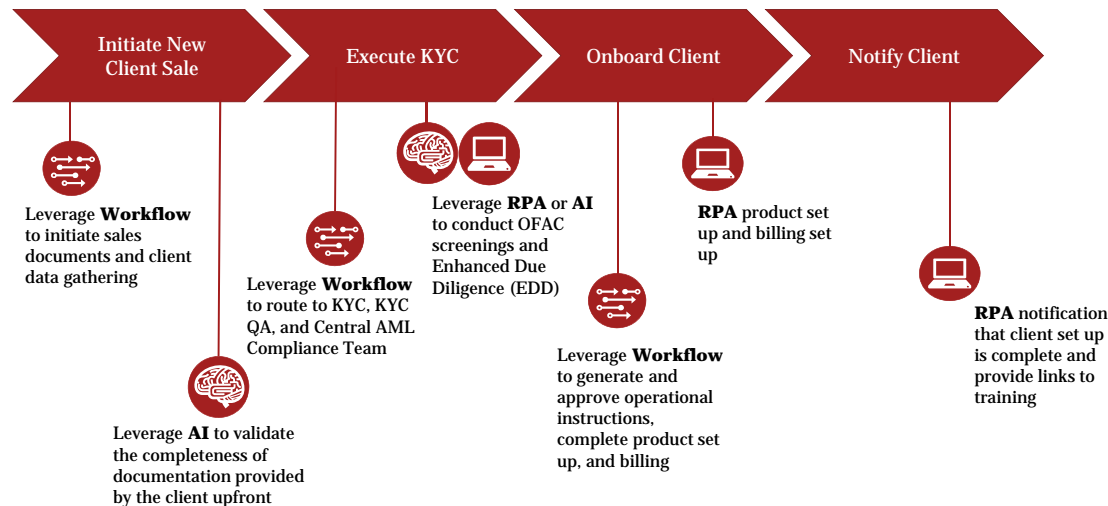

- Sites: Enterprise COE, worldwide program

- Bots: 10 processes, large pipeline

- Use Cases: Finance & Accounting SS and Operations. Processes include month-end closing, record-to-report, hire-to-retire, Tax extraction and reclamation of GST from other countries

- Applications: Oracle Financials, automated tax filings

Case Study: Integrating client onboarding and KYC

Applying a set of automation tools can reduce the number of manual hand-offs, drive transparency in the end to end process, and onboard clients faster creating a better customer experience

Illustrative Integrated Client Onboarding and KYC Process

Initiate New Client Sale → Execute KYC → Onboard Client → Notify Client

Leverage **Workflow** to initiate sales documents and client data gathering

Leverage **Workflow** to route to KYC, KYC QA, and Central AML Compliance Team

Leverage **AI** to validate the completeness of documentation provided by the client upfront

Leverage **RPA** or **AI** to conduct OFAC screenings and Enhanced Due Diligence (EDD)

Leverage **Workflow** to generate and approve operational instructions, complete product set up, and billing

RPA product set up and billing set up

RPA notification that client set up is complete and provide links to training

Automation Tools

= RPA

= Workflow/BPM

= AI/Cognitive Automation

Potential Benefits

- Reduces time to onboard clients from weeks to days
- Reduces multiple client touchpoints to gather documentation
- Automates project set up and billing set up activities
- Enables client onboarding transparency within the end to end process and duration its taken
- Leverages workflow to execute the multiple internal hand-offs and interactions with the client

Impact to the workforce – People impacts of automation

Automation will impact people management and how a company thinks about its workforce

How risks of automation are managed
How will people, cyber security, productivity and reputation risks be managed?

How people are reskilled and prepared for lifelong learning
How effective is your learning function at building an adaptive workforce?

Impact on jobs, compensation, structure and transition
What capabilities are required? How will jobs, structures and compensation evolve?

People Risks

Purpose & Social Responsibility

Mindset & Behavior

People Impacts of Automation

Learning & Development

People Policy & Governance

Organization & Job Design

How automation aligns with corporate purpose
Is your organization demonstrating a commitment to sustaining jobs in the local community?

How open people are to new ways of working and capacity for change
How will current behaviors and/or mindsets change? What can leaders do to drive awareness and adoption?

Impact on people policies and decision-making process
What types of people policies are necessary to enable the new ways of working?
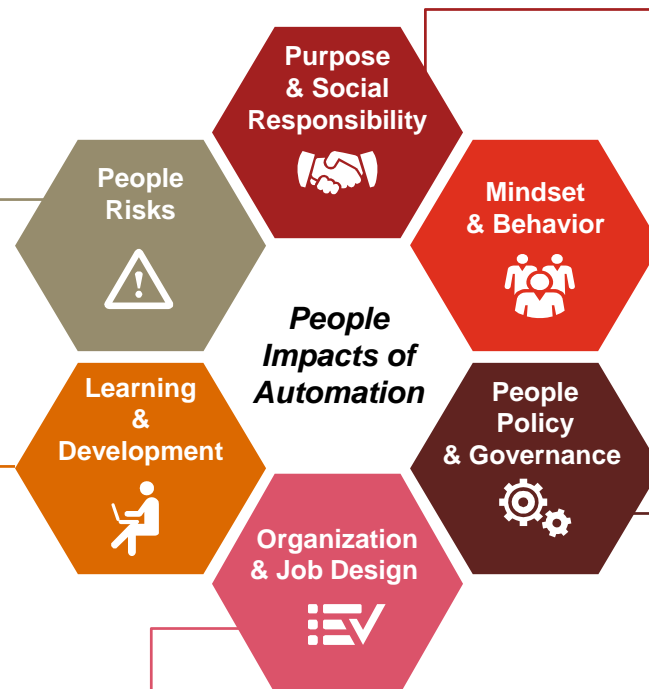
Impact to the workforce – Practical impacts

Managing the people directly impacted by workforce demand changes goes beyond workforce reduction and re-alignment

	Description	Considerations
Workforce reskilling	*Embedding core automation technology skills into business*	• New or different skill sets needed due to elimination of repeatable tasks and focus on more strategic work • Need for recruitment of new talent • Mechanism for knowledge sharing across the firm
Spans and layers	*Impact of automation to business process ownership and supervisory model*	• Changes to organizational design, including reporting structures, due to new technology and processes • Changes to the way people engage with business processes and the complexity of tasks they focus on • Physical workplace changes due to different people/roles
Organizational re-design/ Alignment	*Leveraging RPA benefits into opportunities to re-shape current function footprint*	• New opportunities to capture and measure people data, including identification of behavioral data patterns • Need for retraining or redeployment of existing talent • Training needed to bring people up to speed on changes, as well as reskill employees for new kinds of roles
Career models	*Impacts to future career paths, and the role of 'run the firm'/'change the firm' career paths*	• Shifts in performance management and rewards • Changes to the desired skills/experience for entry level employees • Re-aligning teams to leverage new mix of skills and experience