



Cognitive RPA

The Future of Automation

January 2019



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President, NASSCOM

The NASSCOM Research report titled “**Cognitive RPA – The Future of Automation**” aims to highlight the state of Robotic Process Automation (RPA) and how it would evolve with advancements in cognitive technologies. In this report we have presented the trends and drivers that are shaping-up RPA growth, and have covered use cases of RPA across various business functions and sectors. In addition, we have also showcased RPA solutions offered by various IT-BPM firms and enterprises in India. Hope you enjoy reading this report.

Acknowledgement



NASSCOM
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This report has been developed by NASSCOM Research through a comprehensive study to understand the RPA landscape in India.

The preparation of this report has been possible with support from various information sources including market insights from representatives from different IT-BPM, GCC firms and enterprises in India who have extended great help to the research team. We wish to sincerely thank all of them for their valuable contributions without which this report would not have been possible.

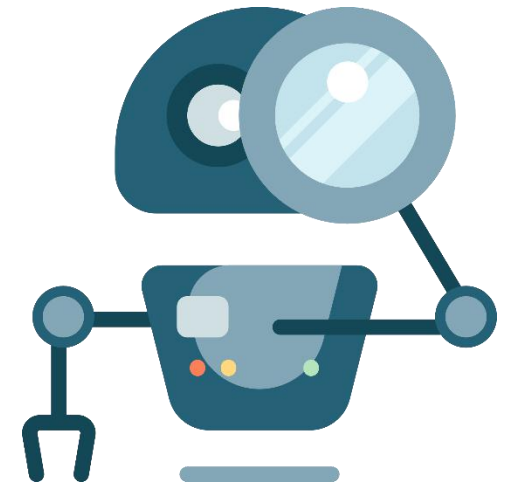


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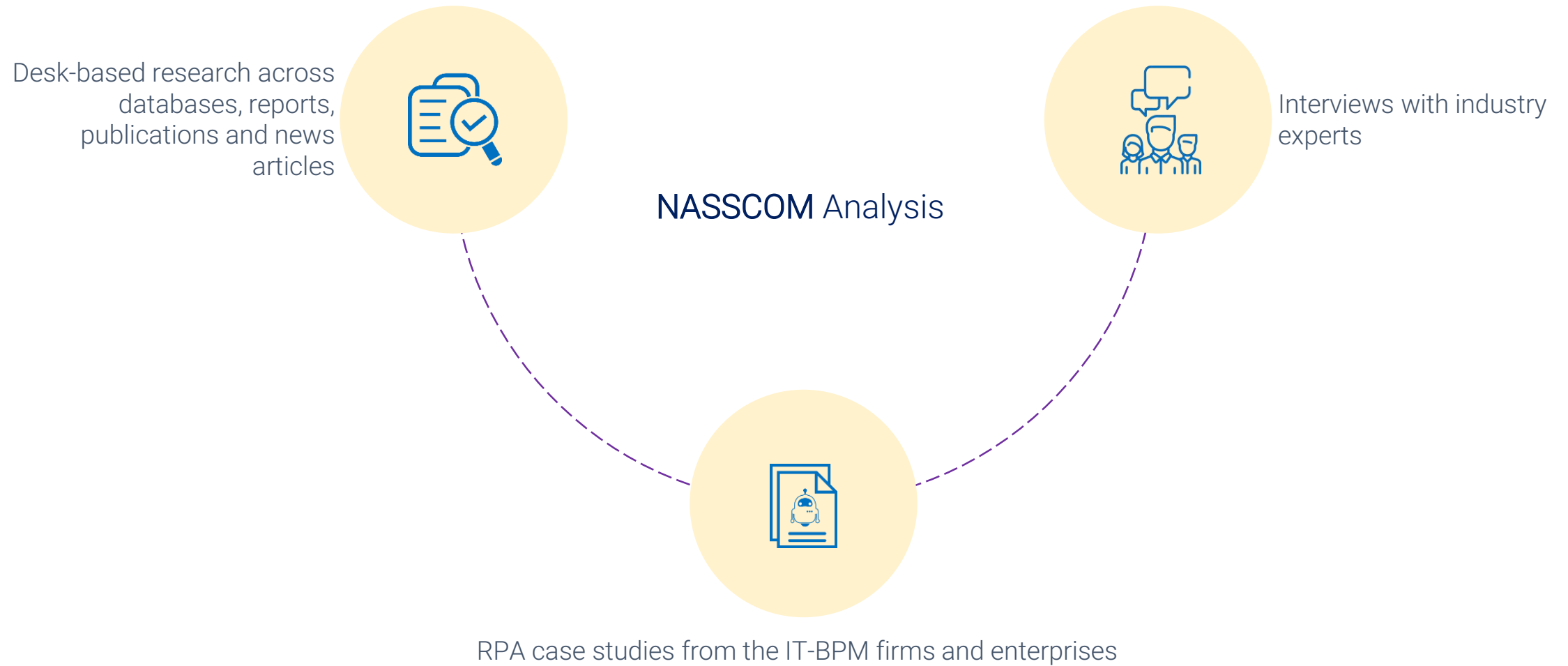
Highlight key business functions and sectors with highest RPA adoption

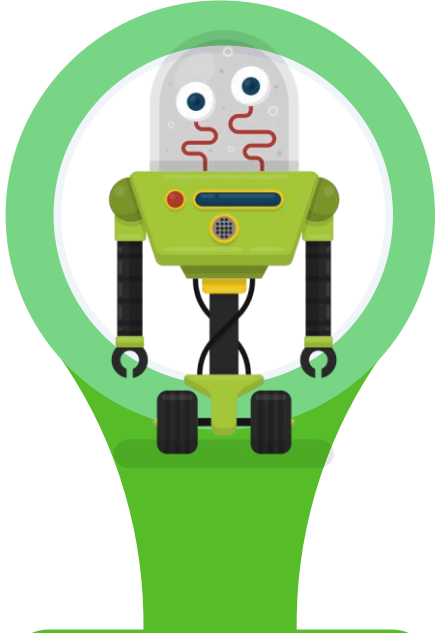
Identify key market trends and drivers

Explore the evolution and impact of cognitive technologies on current RPA solutions

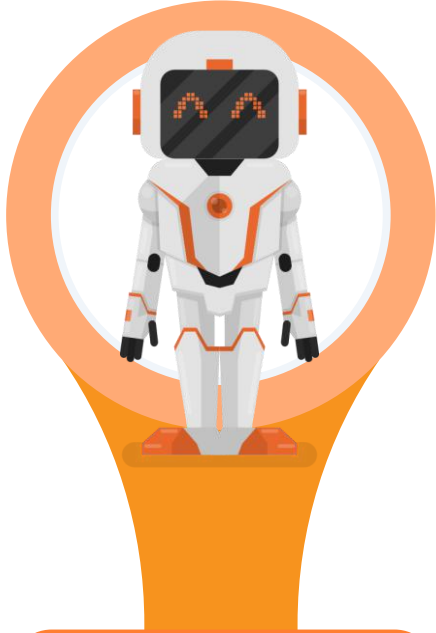
To develop an understanding of RPA landscape

Present case studies highlighting RPA innovations and use cases

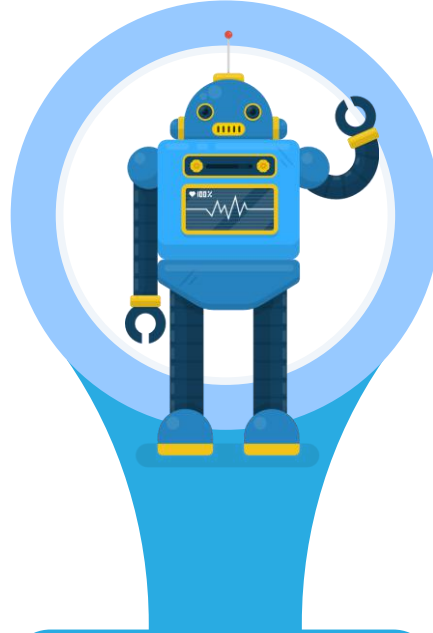




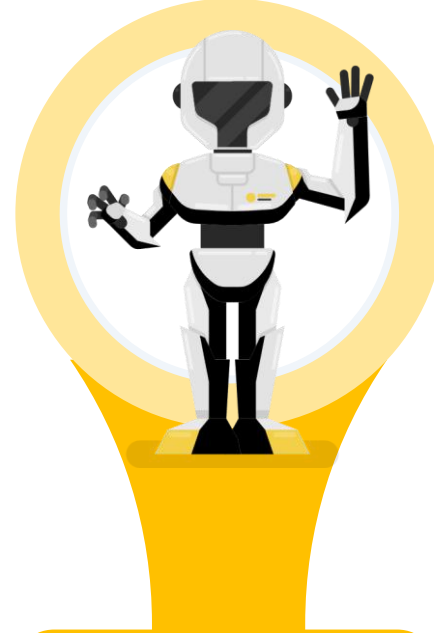
Global RPA software and services market is expected to grow **29% (CAGR)** between 2017-21 to reach USD 1.2 billion



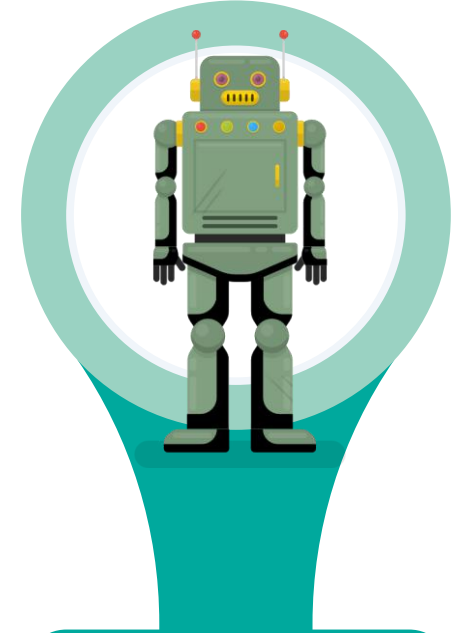
RPA finds highest adoption in **BFSI** and **BPM** sectors, and in **Finance & Accounting** and **Contact Centre** functions



RPA adoption is driven by factors such as **cost reduction**, **high accuracy**, **24/7 availability**, and **revenue enhancement**



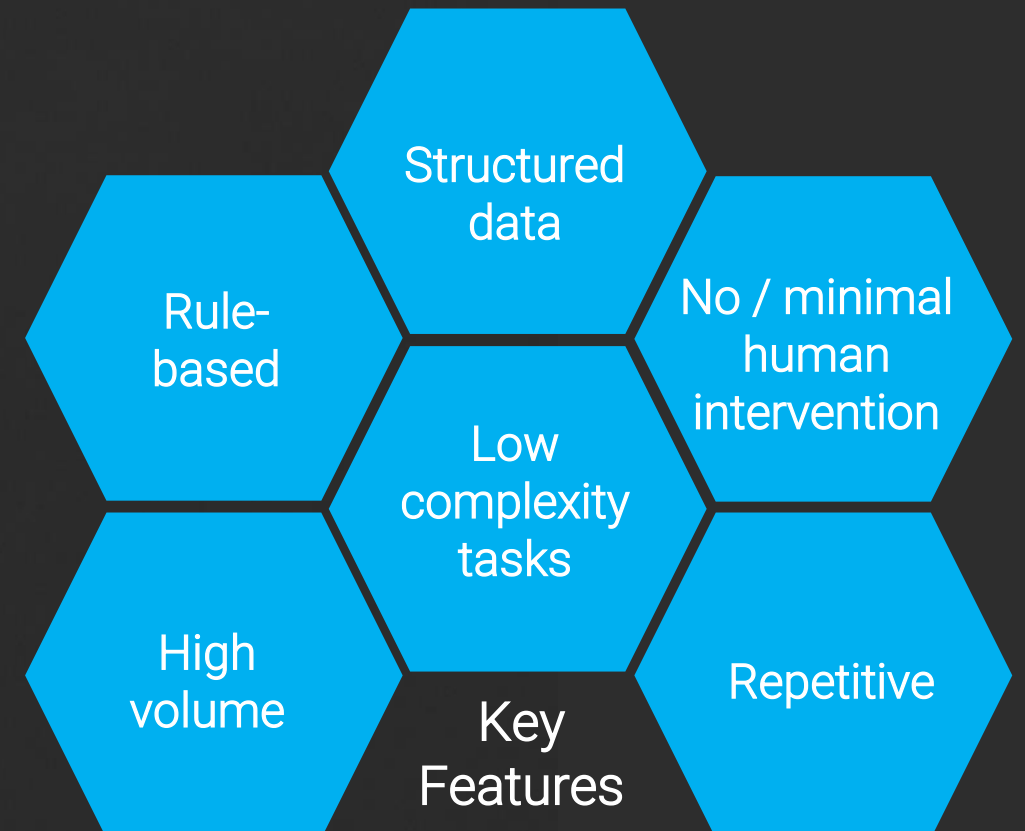
Enterprises are moving from experimentation stage to early adoption with a focus on adding **cognitive components** to RPA solutions



With advancements in cognitive technologies **RPA** would be able to handle **end-to-end task automation** with real-time exceptions



RPA is the technology that allows enterprises to configure computer software, or a “software robot” that automates human activities, partially or fully



RPA Bot: A software robot is located on virtual / physical client environment where it interacts with various business applications

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Detailed code /
instructions that
replicate human steps

Developer Tools

Assign jobs to robots
and monitor their
activities
Store
code/instructions

Robot Controller

Houses robots in virtual /
physical client environment

Client Environment

Review and resolve
any exceptions or
escalations

Business Users

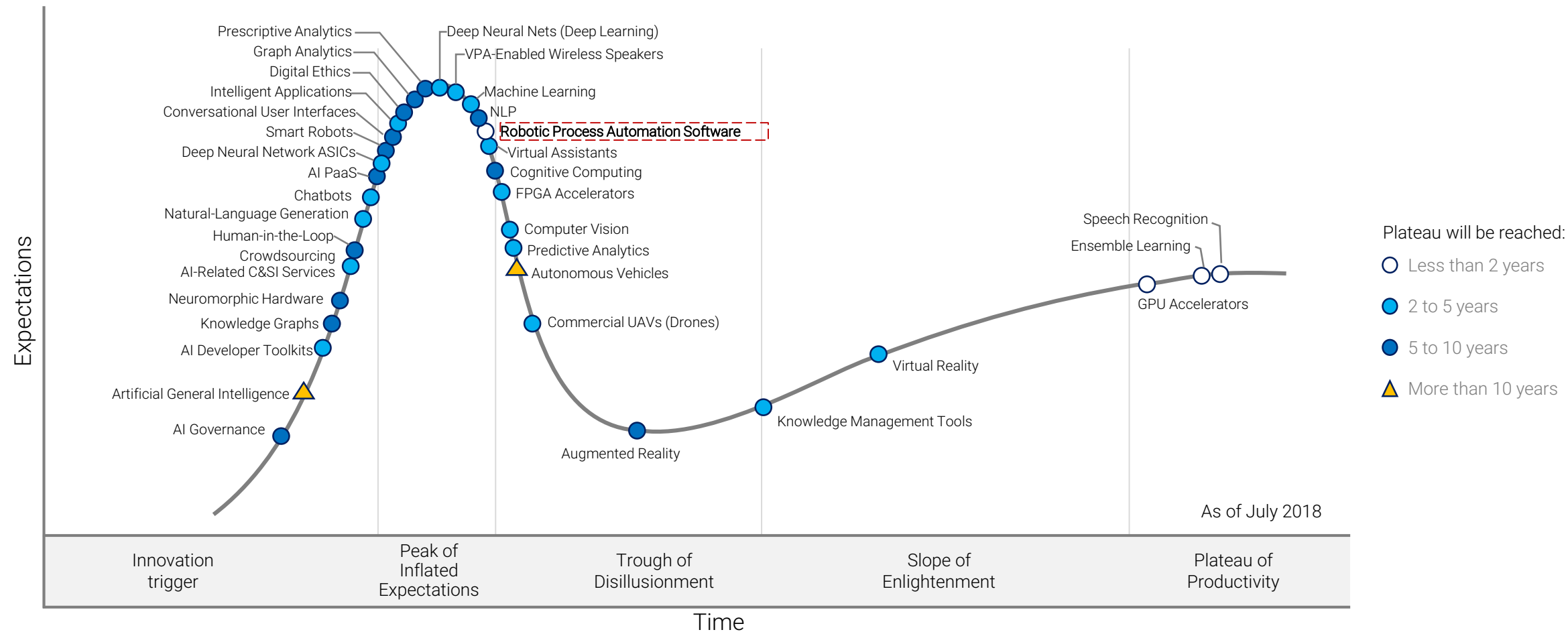
Applications

Robots interact with range of
enterprise applications



RPA has advanced significantly over the years and is now becoming more mainstream

Hype Cycle for Artificial Intelligence, 2018



- RPA solutions are being implemented by an increasing number of enterprises, resulting in becoming more mainstream and moving further along the curve
- With introduction of AI / cognitive technologies such as ML, NLP, etc., RPA is expected to gain further traction



RPA has evolved from being a cost reduction measure to a revenue enhancement tool...

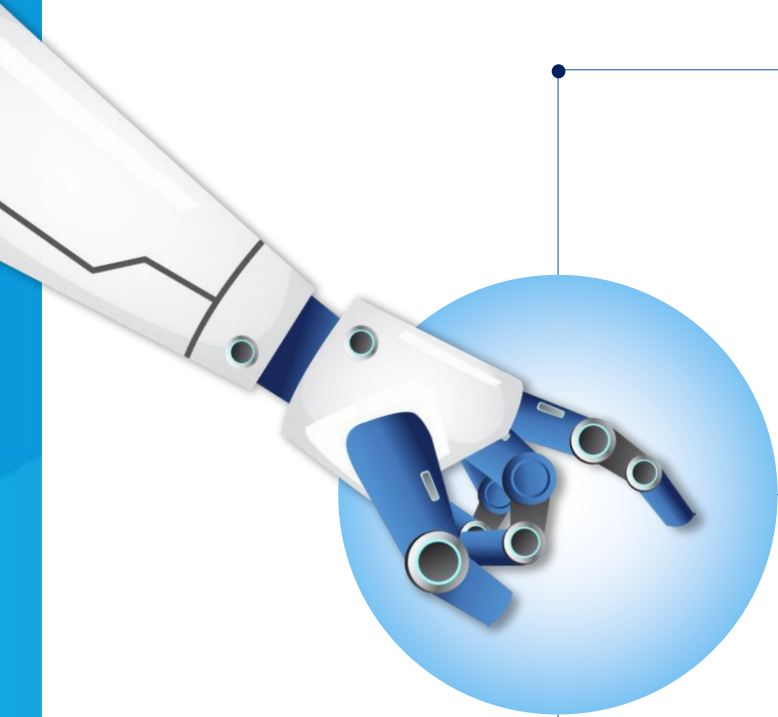
RPA Advantage



...and is now considered as an enabler for value-centric drivers such as compliance, analytics, etc.



Trends



Increasing number of enterprises across different industries are adopting RPA for large-scale and multi-process use case implementations

There has seen a shift from cost reduction as an enabler for value-centric drivers such as compliance, shorter cycle times, autonomous processing, etc.

Increased verticalization, as process agnostic RPA tools are evolving into industry-, process- and platform-specific solutions

Enterprises are moving from experimentation stage to early adoption with a focus on adding cognitive component to RPA solutions

RPA service providers started combining RPA tools with AI and analytics engines to offer intelligent automation solutions

RPA adoption is further driven by their quick deployment without disrupting the existing legacy systems

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Drivers

Quick payback on RPA investments
Headcount savings from RPA range from 10-25%

Easy transition
RPA transition requires low levels of investment and can delay replacement of legacy IT Systems

Faster deployments
Proof of value can be delivered within 3-6 weeks and takes 3-4 months for deployment

Self-sufficient & sustainable

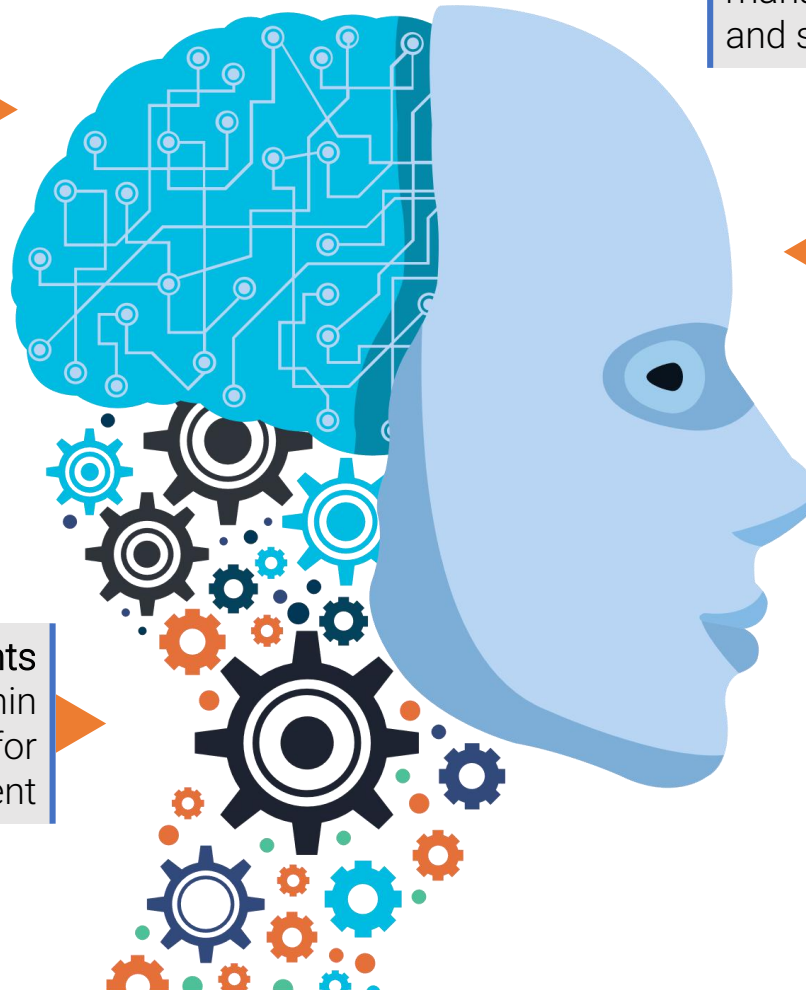
Software robots operate in self-managing, self-diagnostic, self-healing and self-sustainable mode

Reliable and accurate

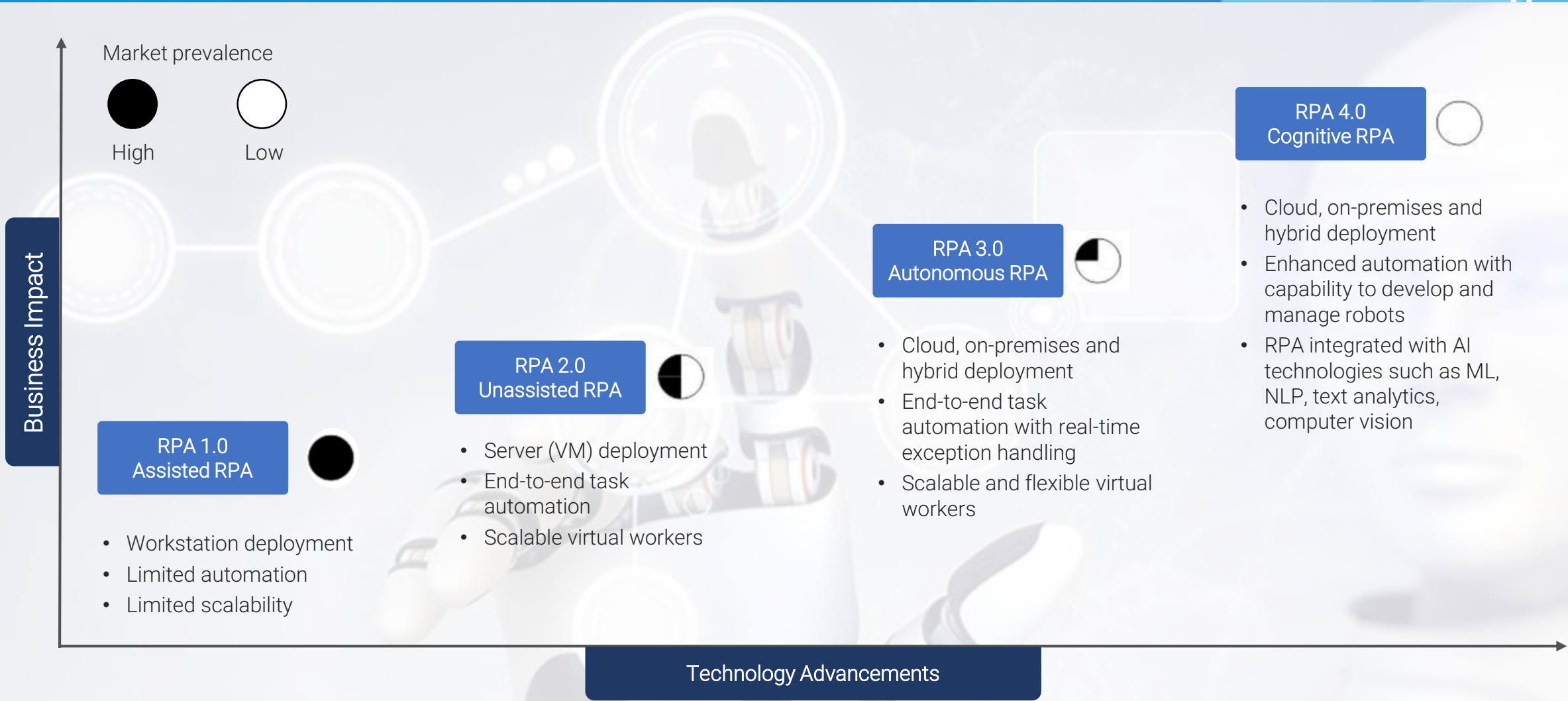
RPA error rates are almost zero and processes are compliant, secure and easier to audit

Improved customer experience

RPA enables employees to focus on more valuable, productive and customer facing roles, thus translating better customer experience



With technological advancements software robots would be able to create and manage robots to handle variations in the workload

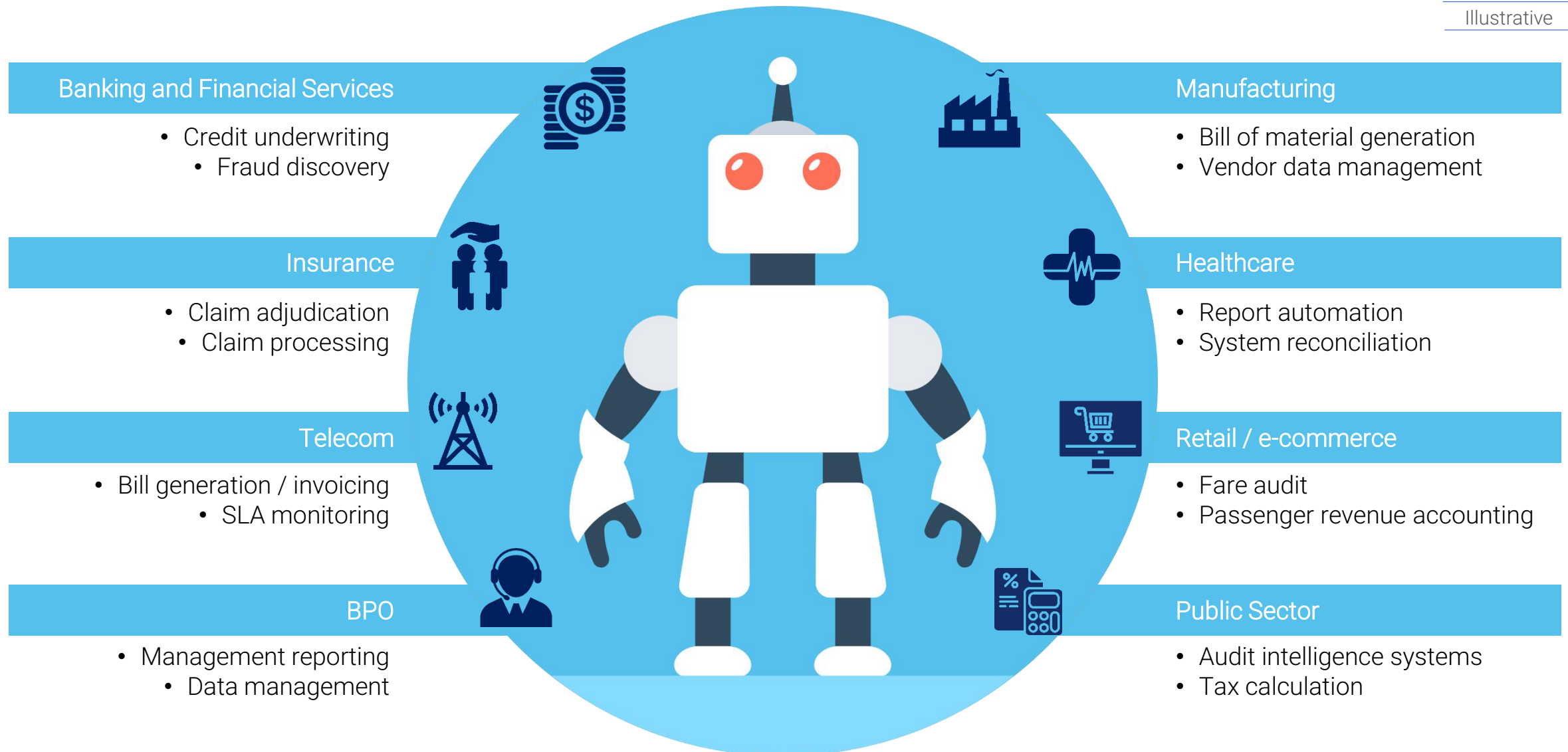


Banking, financial services and insurance companies have been the early adopters of RPA, driven primarily by revenue and cost pressures

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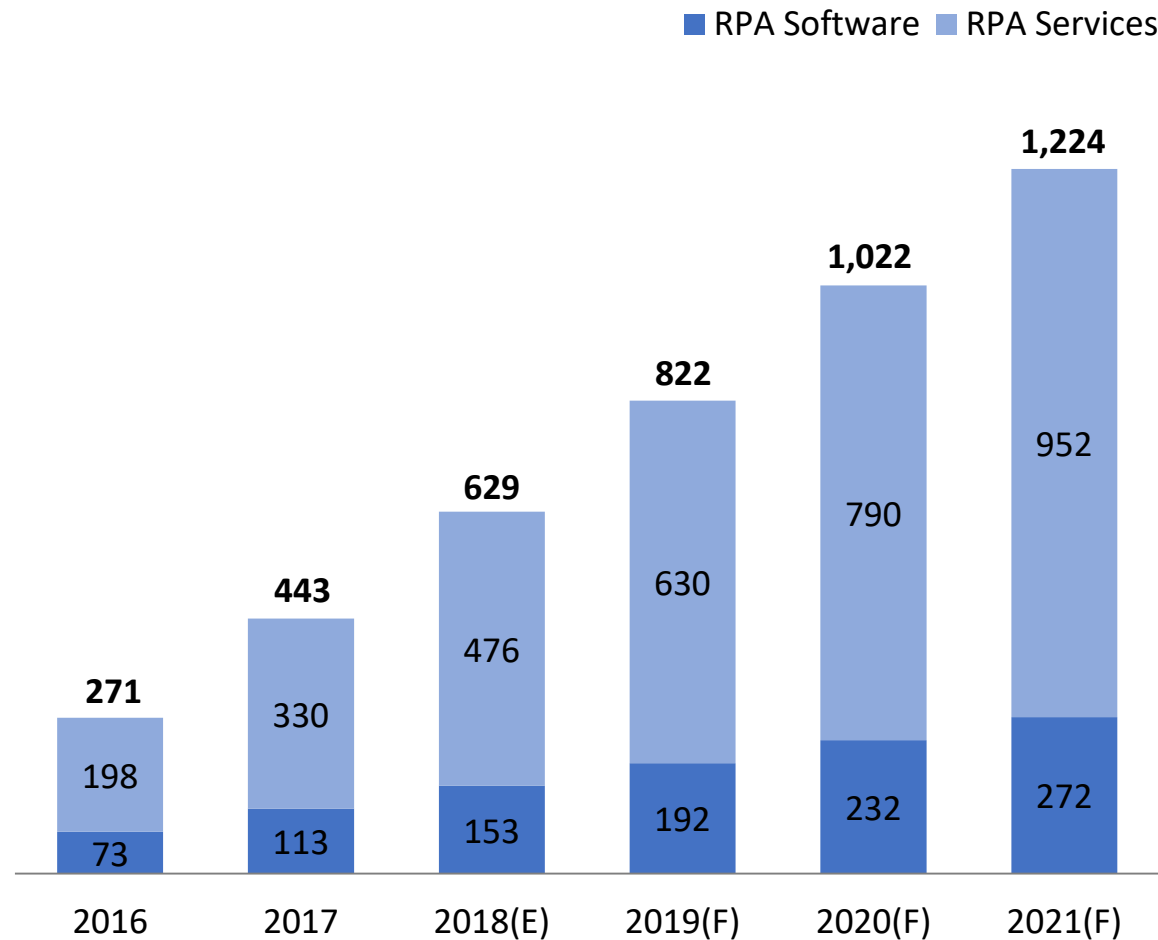


Illustrative



Global RPA software and services market is expected to reach USD 1.2 billion, growing at 29% CAGR between 2017-21

Global RPA Software and Services Market, 2016-21, USD million



- Americas (~46%) accounts for highest RPA adoption, followed by the UK (~19%) and Asia Pacific (~14%)
- Assisted RPA accounts for about 57% of RPA deployment. Remaining deployments are unassisted, primarily on-premise (~33%) and cloud (10%)

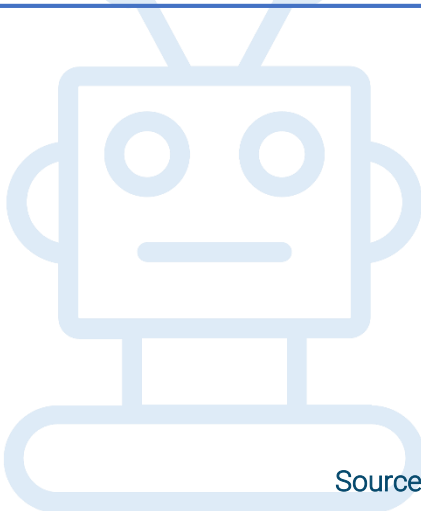


The RPA technology supplier ecosystem consists of three key participants; service providers, technology vendors and integrators



Illustrative

| Service Providers | Technology Vendors | Technology Integrators |
|---|---|---|
|  |  |  |
|  |  |  |
|  |  |  |
|  |  | |
|  |  | |



RPA service providers in India are strengthening their in-house intelligent automation and AI capabilities, especially around IP and asset creation

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Illustrative



Focused on building products and platforms that leverage AI, IT automation, and RPA



Provides modular building blocks of Intelligent Automation including RPA, cognitive solutions, AI and self-learning engines



AI platform built on Infosys' first-gen AI platform 'Infosys Mana', and its RPA solution 'AssistEdge'



Intelligent automation solution that leverages AI, ML and advanced software engineering to transform enterprise IT services



AI platform that helps enterprises to hyper-automate processes, redefine operations through algorithmic intelligence and cognitive computing capabilities



An automation platform that utilizes integrated RPA, autonomics, and cognitive computing to transform IT and process operations across the enterprise technology stack

At the same time, service providers are also developing partnerships with leading providers of RPA tools

Illustrative

Service Providers

Technology Vendors



Mphasis entered into partnership with UiPath to provide automation services to Mphasis' banking & financial services customers



Hexaware entered into partnership with UiPath to transform client's support processes by enabling intelligent automation of back office administrative processes through RPA



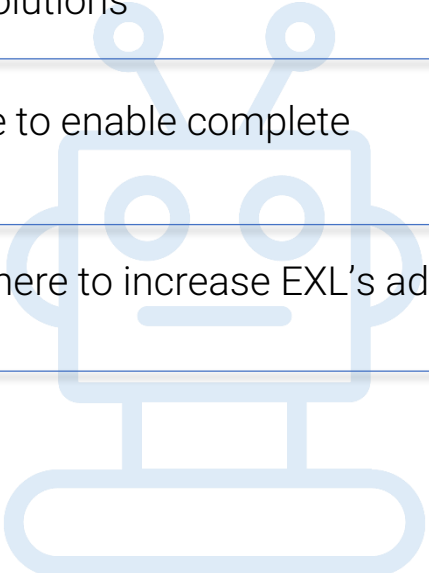
Apart from proprietary capabilities, Wipro leverages tools from Automation Anywhere, Blue Prism, UI Path, and other technology vendors to deliver RPA solutions



HCL has partnered with Blue Prism and Automation Anywhere to enable complete transformation of business processes through RPA














EXL entered into a strategic partnership with Automation Anywhere to increase EXL's advanced automation and robotics suite of solutions



2018 witnessed significant investments in global RPA firms that plan to strengthen their operations in India

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| Company | Investment | Investors | Investment Stage | Brief Description |
|--|-------------------------------------|---|------------------|---|
|  | USD 225 million (September 2018) |    | Series C | Part of the funding is planned to expand its presence to eight cities in India including Chennai, Pune, Hyderabad and Kolkata, and ramp-up workforce across all functions in Bengaluru, Mumbai, and Gurgaon |
|  | USD 15 million (August 2018) |  | Series A | Offer end-to-end, AI-based RPA solutions to enterprises in emerging markets like Philippines, India, China, etc. |
|  | USD 250 million (July 2018) |     | Series A | Strengthen customer engagements in North America, LATAM, India, Europe, Australia, Japan, South Korea and Singapore, and deploy its technology in additional geographies. Also plans to double it's India headcount to reach over 800 by 2019 |

Going forward, enterprises will focus on coupling RPA with AI technologies such as ML, NLP and to achieve higher business impact

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Combining robots with cognitive technologies would allow robots to work within more complex scenarios that would typically require human judgment or decision making

Cognitive-enabled RPA would allow automation of processes that involve unstructured data such as emails, images, etc., as an input

It would allow robots to extract and interpret information from a variety of mediums, to identify patterns and make decisions or predictions

AI Technologies that could extend RPA's reach

Natural language processing



Recommendation engines



Machine learning



Speech recognition



Image analysis



Computer vision



Deep learning



Predictive analytics





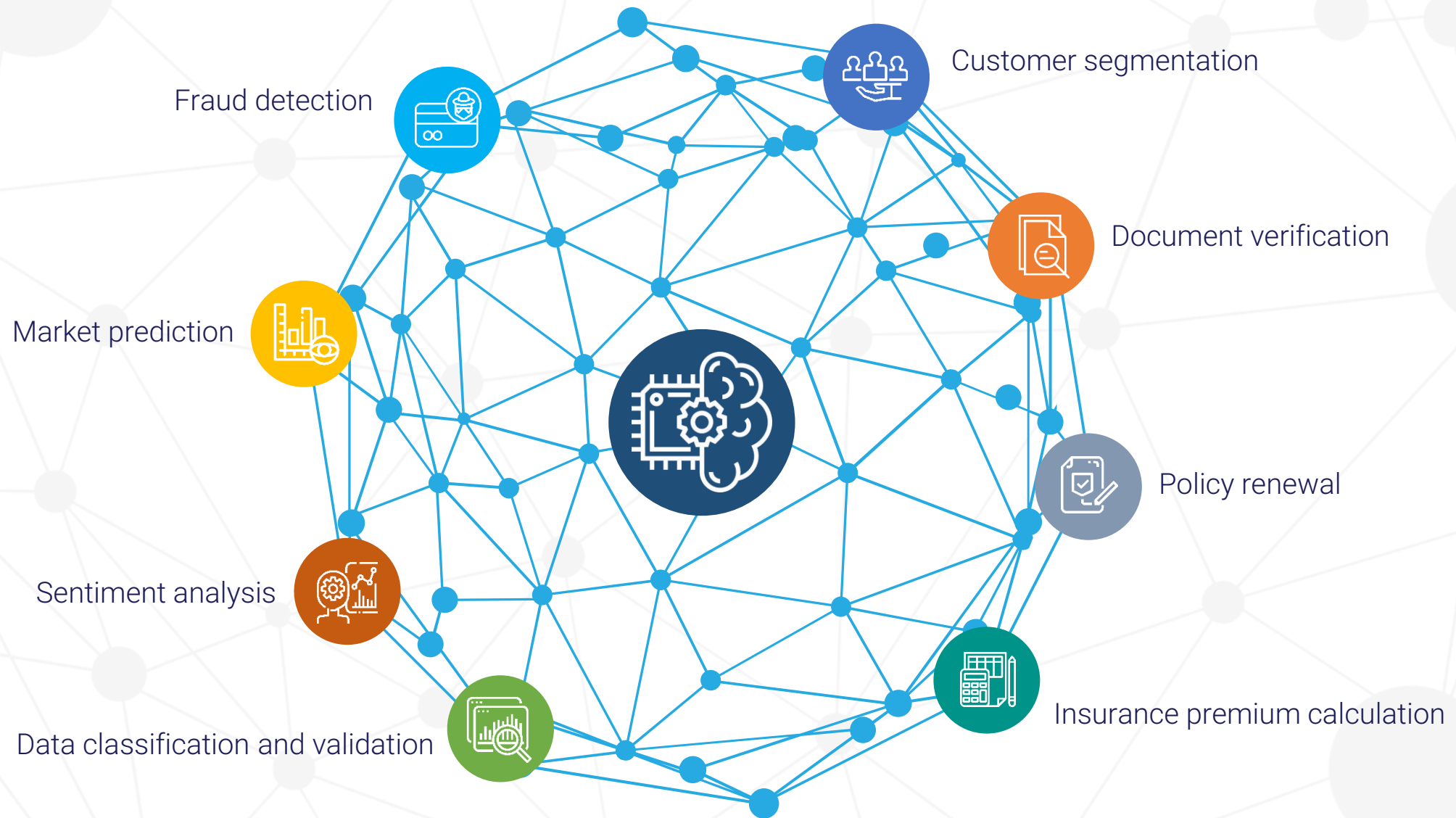
| | RPA | Cognitive RPA |
|-------------------|--|--|
| Application | Mimics repetitive human tasks that do not require decision-making | Mimics human behavior that require decision-making |
| Technology | Leverages basic technologies, such as screen scraping, macro scripts and workflow automation | Leverages advanced technologies, such as NLP, ML, text analytics |
| Automation Method | Rule-based that works on the 'if-then' principle | Knowledge-based |
| Data Processing | Works with standardized, structured or semi-structured data such as spreadsheets, databases | Works with non-standardized, semi-structured and unstructured data such as e-mails, invoices, images |

...cognitive technologies are expected to bring smart capabilities to existing RPA offerings to include activities that require intelligence

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Illustrative



Relevance of cognitive technologies in RPA is further reflected by recent collaborations between non-conventional players in the ecosystem

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Illustrative



Department for
International Trade

October 2018: Launched Accelerator Engagement Program to partner with start-up accelerators from across the world to gain early access to potential fintech ideas and innovative solutions in the areas of RPA, AI, ML, analytics, etc.

TVS
CREDIT

zone
STARTUPS
INDIA

August 2018: Launched 'FinDhan', a multi-format startup engagement program to work with fintech and enterprise tech startups in areas critical to financial services including RPA

— CASE STUDIES —

Client Details



- Client: Multiple clients
- Client's sector: Retail, BFSI, IT & ITES, etc.
- Business function(s): HRO

Problem Statement



- Automate manual processes to reduce costs, drive efficiencies, eliminate errors, and free-up employees from repetitive tasks so they could focus on higher-value work

Processes Automated



- Statutory Compliance life cycle

- Implemented robots to automate PF UAN generation, ESI IP generation, PF and ESI Challans generation, missing details updating, KYC updating, etc.



Solution

- 100% accuracy achieved
- 60% improvement in TAT
- Improved employee morale
- Saved 240 FTE hours per month who started performing higher-value tasks



Value Delivered

- Exploring implementation of cognitive RPA in above areas



Tools / Technology

Client Details



- Client: Leading European insurance company
- Business function: Customer contact centre

Problem Statement



- Discrete legacy applications landscape and multiple touch points, due to which customer service time was higher, leading to customer dissatisfaction.
- High levels of staffing - 500+ Customer Managers (CM) servicing customers
- Customer looking to reduce operational expenditure to fund transformation
- High expenses to train agents across multiple product lines, high manual efforts, quality errors and long wait time

Processes Automated



- Policy Retention (Enquiry, Cancellation, Payment, MTA)

- Automation solution implemented for 40+ use cases in Personal Lines: Home, Motor and Pet
- Unified self-service portal for CSRs to integrate policy details from 8+ legacy applications
- Plug and play RPA solution integrated with various technologies - Salesforce, Windows, Mainframe, VBA excel based applications, etc.
- Agile transformation



Solution

- Reduction of 40+ FTEs for Personal Lines division
- Average 90% reduction in TAT, improved accuracy of transactions
- 2x faster customer service
- Processed over 500,000+ bot transactions & served 140,000+ policies since production deployment (April 2017) with coverage >98%
- Scalable solution to be taken forward for other process area and geographies



Value Delivered

- Robotic automation with integrated smart portal for agent/customer self service



Tools / Technology

Client Details



- Client: HDFC Life
- Client's sector: Insurance
- Business function: Finance

- Reduction of manual errors, those may lead to recovery
- Process payouts with reduced TAT
- Reduce human dependency
- Provide accurate and faster reports to management



Solution

Problem Statement



- Reduce TAT for generating quotes for customer initiated payouts and for actual payment

- The robot handles ~2,000 cases per day
- Reduced quote generation TAT from 3 days to few minutes
- Reduced payout TAT from 7 days to 2 days
- Approximately \$1 billion payout processed with 100% volume and 100% accuracy
- Significantly reduced headcount required for the process



Value Delivered

Processes Automated



- Quote generation
- Payout
- Others

- AutomationEdge RPA



Tools / Technology

Client Details



- Client: Leading Indian bank
- Client's sector: Banking and Insurance
- Business process: New account opening

Problem Statement



- Automate tedious process of verifying KYC documents and images with the account opening forms
- It took 15-20 minutes for each "Tab Banking" case limiting the number of account opening to only 3,000 per day

Processes Automated



- New account opening process
- Automated more than 300+ processes

- Datamatics TruBot enabled intelligent data-capture from KYC documents.
- The solution involved auto-image enhancement of the captured documents post which the details were extracted from the image using in-built Optical Character Recognition (OCR) in real-time
- Post OCR extraction, the solution automatically performed KYC data cleansing and matching with the Account Opening form using fuzzy logic



Solution

- Increased revenue by 5x times
- Improved employee productivity by 500%, that is accounts opened per day grew from 3,000 to 15,000 with the same workforce
- Enhanced customer experience by reducing processing time from 12 mins to 3 mins
- Reduced resource cost by 25%
- Instituted a "Go Green" system



Value Delivered

- Datamatics used TruBot (Robotic Process Automation) and TruBot Neuro (TruBot with AI capabilities) for cognitive processing



Tools / Technology

Client Details



- Client: Leading software & services provider to the world's most successful communications and media companies
- Client's sector: Telecom
- Business function: HR

Problem Statement



- Delay in letter generation and printing due to high volume of requests
- Employees demanding high availability of HR teams with faster response time
- Need for Supporting functions to spend more time in handling complex employee engagements

Processes Automated



- HRMS Letter generation process

- RPA Bot interacts with multiple applications:
 - Citrix Environment (HR Ticketing Tool)
 - Employee Engage Portal (SAP - Success factors)
 - MS Excel, MS Word
 - Email Automation
- Custom built NLP features used to classify letter type and extract purpose



Solution

- Faster Turn-around time
- 100% Accuracy
- 80% reduction in redundant work such as –
 - Logging into Clarity HR tool and SAP Engage portal multiple times
 - Updating the tracker file and printing for letters



Value Delivered

- RPA Tool - UiPath
- Custom-built NLP Engine



Tools / Technology

Client Details



- Client's sector: Travel retail
- Business function/process: HR/MIS reporting

- The UiPath robot handled the automation of the report by fetching the report from SAP, formatting it as per the client requirement and sharing the same with the listed stakeholders



Solution

Problem Statement



- A daily leavers report is manually prepared which is shared with the Staff Travel Team for deduction of the concession amount for the leavers. This report does not involve any judgment and takes ~2 hours to prepare on a daily basis

- Degree of robotization: 100% of effort automated
- Error rate reduced to 0%
- Manual effort reduction
- Faster processing time



Value Delivered

Processes Automated



- Retrieval and completion of customer reports via UI Path

- UiPath



Tools / Technology

Client Details



- Client: STS (in-house)
- Client's sector: Information Technology
- Business function/process: Data entry of leads generated by sales team

Problem Statement



- Automate manual processes of data entry to reduce costs, drive efficiencies, eliminate errors, and free-up employees from sales team from repetitive tasks of data entry which is adding leads information into suitecrm, so they could focus on higher-value work.

Processes Automated



- Manual data entry work

- Implemented a robot to automate data entry process of manually login into gmail and extracting data inside the image in an email and inserting it into suitecrm, eliminating all intensive, high-volume, and error-prone manual tasks



Solution

- An old process would take around 200 seconds to enter the lead details into suitecrm, which was reduced to 40 seconds
- 90% accuracy achieved
- 500% improvement in TAT
- Saved 6 FTE hours per day who started performing higher-value tasks.



Value Delivered

- Used Optical character recognition (OCR) technology from Google to extract the text from the image
- Used UiPath RPA software



Tools / Technology

Client Details



- Client: Tata Motors Ltd & Subsidiaries
- Client's sector: Automobile
- Business functions/processes: Procure to Pay (P2P), Order to Cash (O2C), Record to Report (R2R), Hire to Retire (H2R)

Problem Statement



- Need for flexibility, scalability in business processes to ensure growth
- Need for sustainable solution to improve process efficiencies (Accuracy, rework related challenges, firefighting) while maintaining work life balance and creating a productive environment
- Low cost solution required, no budgetary provisions to support agenda, considering cyclical business downturn

Processes Automated



- Procure to Pay (Invoice verification, Bank interest reconciliation, GR reconciliation)
- Order to Cash (Sales Order verification report, Credit memo verification report, Chassis Transportation freight charges processing)
- Hire to Retire (Car loan subsidy process, Master Data – PA 30/40 updation)
- Record to Report (Quarter end schedule preparations)

- Conceptualized, designed and developed in-house RPA CoE to build Robots to automate high-volume, repeatable-tasks for breakthrough productivity improvement
- Robust internal capabilities developed focusing on BOT opportunity assessment, RPA amenability. Meticulous feasibility assessment methodology devised and implemented, comprehensive process assessment templates in place. This was followed by innovative in-house development of BOTS by an internal team who took up the challenge
- Thereafter BOTs were implemented across service lines with minimal cost impact; which led to massive morale and productivity improvements, thereby elevating the nature of work from dull, repetitive tasks to more value add activities



Solution

- 100% accuracy achieved
- 75%-80% improvement in TAT
- 15% productivity gain in service delivery
- Saved 3,894 FTE hours per month who started performing more value added tasks



Value Delivered

- Worked with Industry leaders to do a couple of PoC, to understand and establish overall cost of RPA agenda
- Considering cost constraints, available internal testing tool {Unified Functional Testing (UFT - HP)} was innovatively repurposed as an RPA engine; existing surplus licenses were optimized and utilized as BOT licenses.
- VBA tools were used for creating BOT scripts and each license used to run multiple scripts to further optimize the utilization
- Exploring to increase cognitive capabilities of the BOTs and integration with machine learning to improve further value add.



Tools / Technology

TCTS' RPA service helps CSPs rapidly deploy cost effective "Software robot or Bots" that can interact with existing Telco applications through its user interface

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Client Details



- Client: Leading Turkish telecom operator
- Business function / process: Radio Transmission Network service creation

Problem Statement



- Delay in Radio Transmission Network service creation process
- Quality issues

Processes Automated



- Radio Transmission Network service creation

- Successfully automated Radio Transmission Network service creation process



Solution

- 880+ man-hours savings (monthly)
- 60% reduction in processing time
- 100% accuracy with exception reporting
- Transaction Quality Improvement
- Reduce manual activities and validation across different levels
- 24*7 execution with real-time scheduling & monitoring



Value
Delivered

- RPA Technology: Automation Anywhere
- Tools Used: Maximo, U2000 & MS Excel



Tools /
Technology

Client Details



- Client: Fortune 100 FMCG company
- Business function: Sales and Distribution

Problem Statement



- High costs for sales coverage and retail execution negatively impacting customer experience and order fill rates

Processes Automated



- Order management
- Digital commerce

- Implemented an Intelligent Customer Assistant which takes orders from customers through Web, Social and Mobile channels leveraging NLP and automating the order fulfilment process through RPA
- The solution involves 4 RPA bots, 1 conversational AI bot and multiple machine learning algorithms to offer personalized promotions and pre-filled baskets for retailers



Solution

- 30% increase in digital sales
- 100% business continuity and 24x7 availability for sales & orders
- 42% savings in FTE on order fulfilment and processing cancellations and returns



Value Delivered

- Natural Language Processing for Conversational AI based chatbots
- Machine Learning and AI



Tools / Technology

Client Details



- Client: Automotive component manufacturer
- Business function: Finance

Solution

- RPA BOTs using Automation Anywhere platform
- Docparser for Intelligent Document Capture



Problem Statement



- High turnover on AP team
- Hiring challenges
- Low throughput
- Data entry errors
- Multi system learning
- Large backlog of AP Invoices
- Frustrated supply base
- Production risks
- Resource drain

Value Delivered

- Reduced reliance on temporary workforce
- Faster processing – backlog greatly reduced
- 100% accuracy
- Improved compliance and auditability
- Access to metrics to facilitate root cause analysis



Processes Automated



- Accounts payable (3 way matching)

Tools / Technology

- Intelligent Document capture (Cognitive)
- Automation Anywhere platform
- ERP: Plex and XA
- Excel
- Outlook (Email)



Client Details



- Client: South Africa based global provider of software and data analytics to the real estate industry across the globe

Problem Statement



- The existing system involves updating and generating tons of reports with manual record selection of units and rate for every single community. As the manual intervention is more, chances of errors increase given that it is a hectic job to match every single record with the desired one. The goal is to improve efficiency with automation of manual tasks.

Processes Automated



- Extract data from PDF/ Excel reports
- Update extracted data (categorized by community, floor, building and unit) to existing web application
- Generate processed accounting reports from existing web application
- Format reports and send it to stakeholders

- Updating extracted data from PDF/ Excel files into existing web system using Blue Prism Application Modeller
- Reports generation from inbuilt web system using Excel VBO from Blue Prism
- Sending a formatted email with the final analysis summary attached to the clients using Blue Prism Outlook Action
- FTP access using Blue Prism FTP Actions



Solution

- Reduced manual overhead time by 40%
- Reduction in cost per person
- 100% accuracy achieved



Value Delivered

- Blue Prism



Tools / Technology

Client Details



- Client: 2sisters Food Group
- Client's sector: Food manufacturing
- Business function: Financial Shared Services

Problem Statement



- Unstructured input data format (pdf)
- Multiple manual touchpoints – Swivel Chair Processing across various applications
- Complex business logics / validations leading to huge processing time
- Multiple ERP systems
- Prone to human errors

Processes Automated



- Accounts Payable
 - Invoice Processing
- Accounts Receivables
 - Cash Allocation and Posting
 - Credit Note Creation
 - Manual Billing

- BOTs deployed have transformed the SSC Operations
- Created operationally led CoE
- Effective audit trail & regulatory compliance



Solution

- 100% Accuracy in remittance cash application across various ERP's
- ~40% gross savings on cost of efforts, rework, penalties
- ~95% efficiency gain
- ~80% reduction in cycle time
- Rapid development framework
- Generate ROI once Robot went live
- 500 million cash posted by 1 Robot in a day



Value Delivered

- Automation Anywhere
- OCR platform



Tools / Technology

Client Details



- Client's sector: Healthcare
- Business function: Customer centric marketing – Affinity monitor

Problem Statement



- Automate manual processes to reduce costs, drive efficiencies, eliminate errors, and free-up employees from repetitive tasks so they could focus on higher-value work

Processes Automated



- End to end processing with minimal human intervention, calculate the affinities for customer marketing

- Used several automation building blocks (RPA, Python, VBA) to create future state
- BOTs automated from downloading the files till running the queries on Hadoop/ Hive Databases till final deliverables (VBA and Powerpoint presentations), eliminating all intensive, high-volume, and error-prone manual tasks
- Excel based file used as communication medium between RPA processing and Human for steps involving decisions



Solution

- 100% accuracy achieved
- 40% improvement in TAT
- Improved work-life balance
- Saved 4,000+ FTE hours per year who started performing higher-value tasks



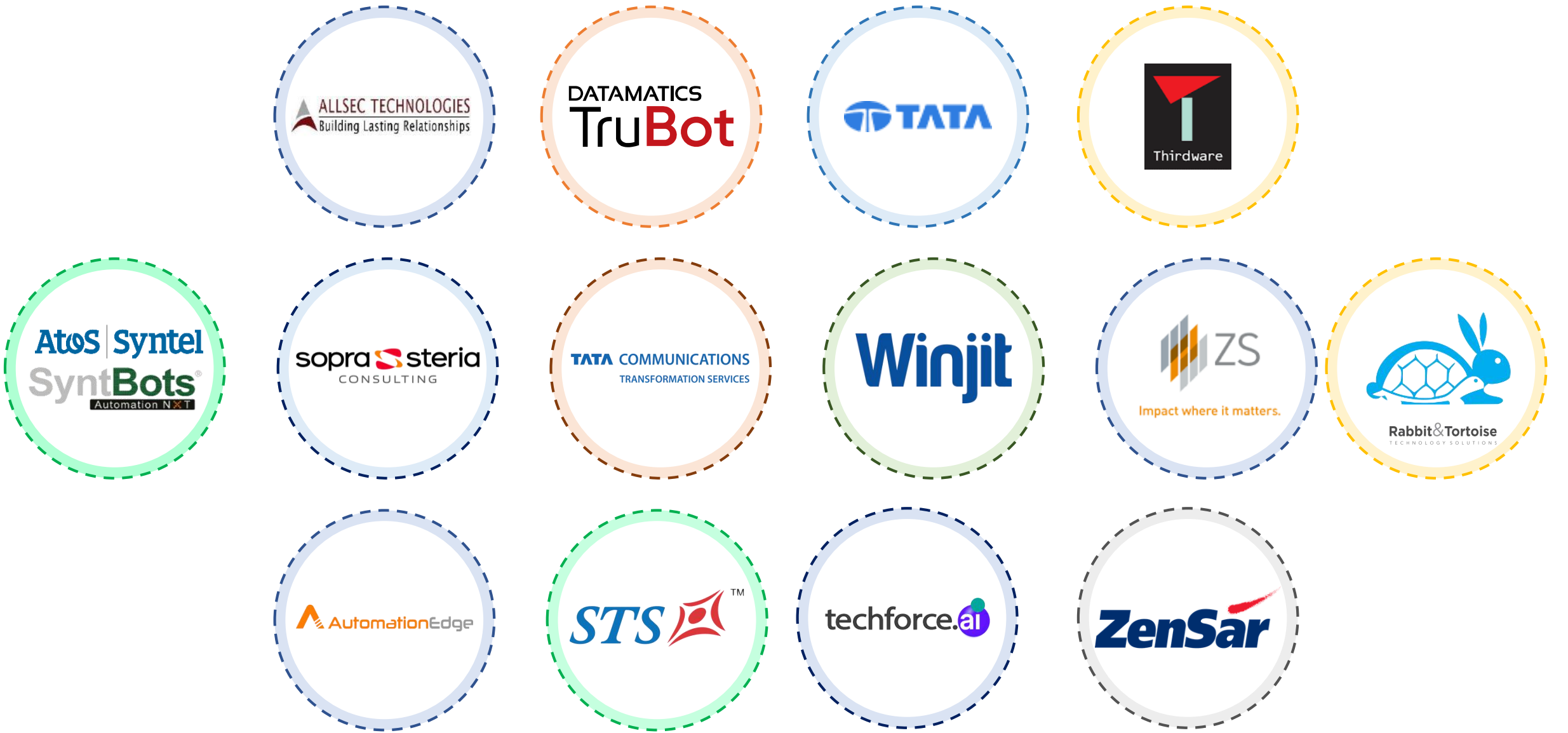
Value Delivered

- Automation Anywhere (RPA for Orchestration)
- Python
- VBA
- PySpark Scripts
- Completely on AWS



Tools / Technology

— APPENDIX —



NASSCOM is the industry association for the IT-BPM sector in India. A not-for-profit organization funded by the industry, its objective is to build a growth led and sustainable technology and business services sector in the country. Established in 1988, NASSCOM's membership has grown over the years and currently stands at over 2,500. These companies represent 95 percent of industry revenues and have enabled the association to spearhead initiatives and programs to build the sector in the country and globally. NASSCOM members are active participants in the new global economy and are admired for their innovative business practices, social initiatives, and thrust on emerging opportunities.

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— Thank You —