# Blockchain and Artificial Intelligence

Broadridge, a global fintech leader with US $4 billion in revenue, provides communications, technology and data and analytics solutions to help clients get ahead of today's challenges and capitalise on what's next. Backed by global resources we help drive business transformation with solutions for enriching client engagement, navigating risk, optimising efficiency and generating revenue growth.

Broadridge has made significant investments in blockchain and artificial intelligence. We are leveraging our deep expertise in post-trade and scale across our extensive network of clients to assess where these new technologies can be applied to drive benefits for our clients.

## BLOCKCHAIN
### Broadridge's Blockchain strategy is focused on 3 workstreams

**Invest in leading blockchain start-ups**

- Invest in start-ups with unique blockchain engineering and capital markets expertise; invested in Digital Asset given focus on cash securities
- Acquired technology assets of InveShare to accelerate development of blockchain US Proxy platform
- Built relationships with leading innovators (e.g. Hyperledger, Enterprise Ethereum Alliance)

**Invest internally across a number of prototypes**

- Built blockchain lab consisting of 30+ associates spanning strategy, business and technology functions
- Executed several prototypes to focus on, based on a rigorous set of selection criteria including whether blockchain can drive a 'step-change' in process improvement and whether Broadridge is uniquely positioned to drive adoption to mutualize industry costs

**Co-innovating with clients in specific areas**

- Engaged multiple clients in discussions on blockchain innovation in specific areas where Broadridge has deep understanding of clients' technology and operations processes
- Inviting select clients to collaborate on specific use cases

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## BROADRIDGE IS UNIQUELY POSITIONED TO HELP YOU ACCELERATE YOUR BLOCKCHAIN EFFORTS

**Deep capital markets expertise:** Broadridge is a trusted global partner to the largest financial institutions for their securities trade processing needs.

- We process $6+ trillion USD in equity and fixed income trades per day globally.
- We are the market leader in Global Fixed Income Trade Processing in the US, processing trades and providing book-record keeping to 18 of the 23 primary dealers.

**Leading innovator in Blockchain:** Broadridge is one of the leading fintech innovators in the blockchain space and has significantly invested in the technology ($100M+):

- We invest in start-ups with unique blockchain engineering and capital markets expertise, such as Digital Asset given focus on cash securities.
- We built our in-house blockchain COE (30+ associates), focused on 1) mapping our blockchain strategy and 2) designing, developing and implementing blockchain solutions for capital markets in collaboration with our clients.

**Experienced developer of minimum viable products (MVP) on blockchain technology:** we have focused on a number of minimum viable products where blockchain technology can provide a step change in process improvement, such as:

- **Repos:** we successfully completed a pilot in October 2017 with Natixis and Societe Generale which leverages blockchain technology to enhance the operational efficiency and auditability of bilateral repurchase, or repo, agreements. The pilot utilises distributed ledger technology capabilities to reduce operational risk for market participants by providing a secure record of repo trade details, reducing the need for reconciliation and removing obstacles to straight through processing. This new blockchain-enabled solution, which automates end-to-end processes, streamlines the repo agreement and confirmation processes, offers a faster and more accurate collateral substitution process, while eliminating time consuming manual interventions, and reduces counterparty risk while increasing auditability.
- **Proxy:** In April 2017, we successfully completed a pilot with J.P. Morgan, Northern Trust and Banco Santander, which employs blockchain technology to enhance global proxy vote transparency and analytics.

The pilot provides transparency by adapting distributed ledger technology capabilities to provide daily insight into vote progress throughout the issuer's proxy voting period, from meeting announcement date to the annual general meeting (AGM). The application ensures role-based access to voting data through use of cryptography and smart contract technology and is built on an Ethereum blockchain platform.

The pilot was run in support of a corporate issuer's AGM and included participation of Santander Investment, the issuer's agent. The pilot was run in parallel of the AGM, with the blockchain being utilised to produce a "shadow" digital register of the proxy voting taking place in the traditional model.

**Active contributor to key industry blockchain protocols:** Our developers are contributors to the most widespread open source blockchain protocols, such as Hyperledger, Ethereum and Quorum.

### ARTIFICIAL INTELLIGENCE
#### Broadridge's approach to Artificial Intelligence
Broadridge has been investing in Artificial Intelligence (AI), including Machine Learning (ML) and Robotic Process Automation (RPA). We have established a Centre of Excellence for AI/ML and RPA with industry leading talent. We are leveraging our deep expertise in post-trade, significant scale across our network of clients and view of industry data to assess where ML and RPA combined could be applied to drive benefits for our clients.

We have piloted and implemented a number of use cases across Broadridge, with an initial focus on ML.

- **Trade Allocations:** Interpreting the trade allocation requests that arrive in structured or unstructured form and then performing the allocations automatically using ML and RPA.
- **Email Categorization:** Solution that takes in client e-mails, converts into structured data using Natural Language Processing and feeds into a ML model to categorise e-mails.
- **Securities Finance Supply and Demand:** Collating information from a range of data sources including securities available for borrow/loan or needed for settlement, short-selling, or any other purpose. This solution allows the mining of data content from emails with offers, needs, or location/hold requests.

Broadridge is also evaluating RPA vendors to enable development of a digital workforce with "cognitive" capabilities that can drive efficiencies for our clients.
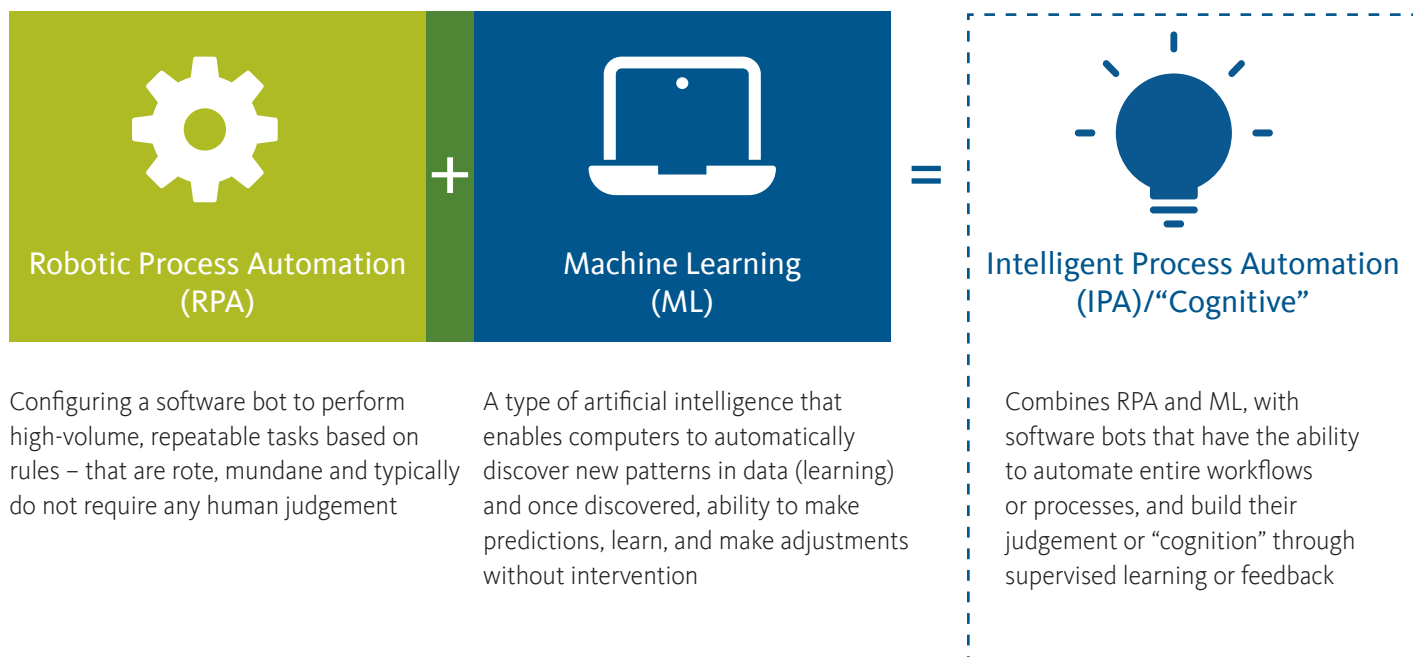
- We will be conducting POCs with 2 shortlisted vendors to finalise our internal RPA vendor, while building strategic partnerships with other vendors to support our clients.

# OUR FOCUS IS ON INVESTING IN "COGNITIVE" APPLICATIONS THAT COMBINE MACHINE LEARNING AND ROBOTIC PROCESS AUTOMATION

## Artificial Intelligence (AI)
A broad umbrella term for enabling machines to appear as if they have human intelligence or perform tasks that usually require human intelligence

Broadridge's Focus

### Robotic Process Automation (RPA)

### Machine Learning (ML)

### Intelligent Process Automation (IPA)/"Cognitive"

Configuring a software bot to perform high-volume, repeatable tasks based on rules – that are rote, mundane and typically do not require any human judgement

A type of artificial intelligence that enables computers to automatically discover new patterns in data (learning) and once discovered, ability to make predictions, learn, and make adjustments without intervention

Combines RPA and ML, with software bots that have the ability to automate entire workflows or processes, and build their judgement or "cognition" through supervised learning or feedback

## OTHER AI TOOLS

| Natural Language Processing (NLP) | Computer Vision (OCR, etc.) | Autonomics |
| --- | --- | --- |

## Ready for Next

Communications
Technology
Data and Analytics

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