

Role of RPA and AI in Transforming Banking Operations



COLLABORATION PARTNER



CONTENTS

1.	Introduction	3
2.	Overview of RPA and AI technology applications across the banking value chain	3
	I. Robotic Process Automation (RPA)	4
	II. Artificial Intelligence (AI)	6
3.	Key Strategy Considerations for banks while deploying RPA and AI technology	9
4.	Outlook for AI and RPA in banking	10



1 | Introduction

Evolve or perish, so says the old adage, and this couldn't be truer for the global banking industry currently. Recent developments in the market such as the proliferation of smart phones, the explosion of social media and growing dominance of online retailers and shared economy platforms such as Uber have brought about a paradigm shift in the concept of customer experience and the quality and speed of service delivery. Customers are increasingly getting accustomed to tailored customer service and the convenience and speed of making online purchases and transacting through mobile devices; which have inadvertently raised their expectations from banking and other financial services providers to offer the same user experience.

Unfortunately, for banks, this gap in customer expectation is being serviced by the flourishing breed of fintech start-ups who have the agility and flexibility to use emerging technologies to introduce innovative business solutions, offer better customer touch points, and most importantly have the ability to pick and choose the parts of banking that they want to focus on. This is driving disruption across the banking industry, and incumbent banks, especially in mature markets such as Europe and the US have already embarked on the digitalization journey to transform their services by investing in the latest technologies and revisiting their business strategy - both internal and external and make it more consumer-focused than product-focused.



For Banks, a big hurdle when competing with fintech start-ups is its inability to achieve operational efficiencies in its back-end processes which in turn inhibit the level of front-end system enhancements that can be made to improve customer experience. Two technologies – Robotic Process Automation (RPA) and Artificial Intelligence (AI) - play a critical role in empowering banks to rapidly automate its business operations and effectively transform the entire business.

Through this whitepaper, IBS Intelligence and Hexaware endeavor to explore how RPA and AI powered cognitive technologies are transforming the banking business industry, specifically in mature markets such as Europe and the US.

2 | Overview of RPA and AI technology applications across the banking value chain

The last 5 years have seen RPA and AI technologies evolve to a point where they are now beyond the hype cycle and are making a visible impact in the banking and financial services industry. These two technologies have applications in every area of the banking value chain right from customer origination and on-boarding to the back-office processing of loans, deposits, managing investments and the closure of a customer account.

However, there is a marked variance in the rate of adoption of these two technologies. The inherently cautious and structurally complex banking industry has been more forthcoming in implementing RPA, which is a less risky and cost-effective

solution and complements workflow solutions perfectly in end-to-end automation of standardized process in banking operations. On the other hand, the more complex artificial intelligence (AI) technology, which uses machine learning, image processing and natural language processing software to deploy cognitive capabilities, has seen relatively slower uptake. The year 2016 saw many of the banks announce investments in AI and are already working on integrating the technology into its banking processes. However, the application of this technology is still seen being done in pockets and is yet to witness an organization wide deployment.

The early adopters of both these next gen technologies have mainly been large global banks mainly in Europe and the US who have the spending power to experiment with new technologies. Direct banks and challenger banks with digital only banking models are fast emerging as foremost adopters of these emerging technologies. Challenger banks which have proliferated in Europe and are now entering the US market and are most likely to be a bigger user of RPA and AI technologies than incumbent banks.

Robotic Process Automation (RPA)

Robotic Process Automation, which is essentially the use of software "robots" to automate repetitive, clerical and typically high-volume tasks, has become one of the most sought after technologies in banking over the last 2-3 years. According to HFS Research, the worldwide RPA software and services market is expected to grow at a CAGR of 35% reaching \$1.2 billion by 2021. This is not surprising considering the demand in the banking industry itself, where more than one third of banking operations are manually executed with dedicated back-office staff.

An RPA function operates by mapping a workflow in the RPA tool for the software robot to follow computer path-ways between screens and various data repositories. An RPA tool can be triggered manually or automatically, move or populate data between prescribed locations, document audit trails, conduct calculations, perform actions, and trigger downstream activities.

Typically, there are two types of RPA models that can be deployed:

- **Unattended RPA:** Deployed where processes can be fully automated, with no need of manual intervention.

Usually these are back-office sub processes.

- **Attended RPA:** Usually deployed in partially automatable processes. Robots are deployed on an employee's workstation, typically in front-office or mid-office banking functions.

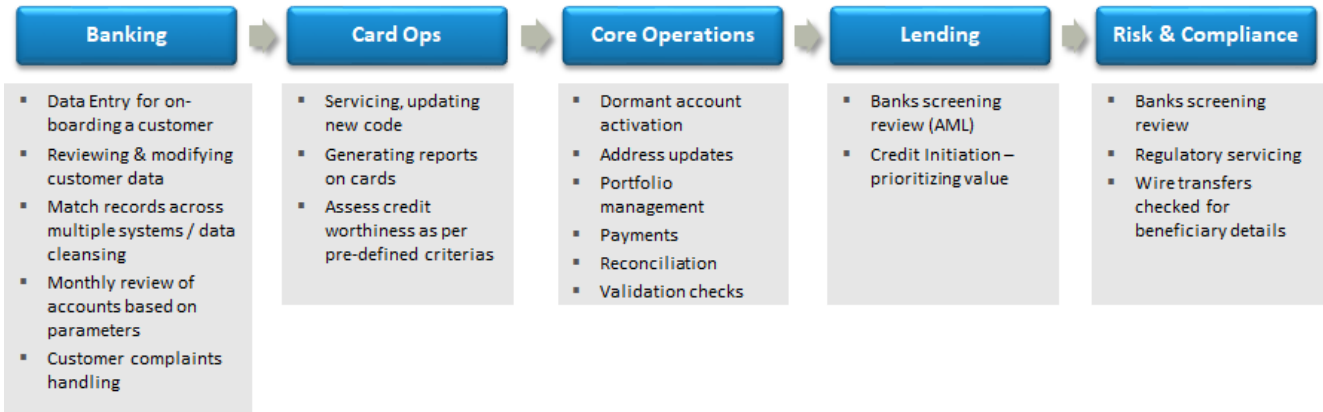
The popularity of RPA can be attributed to its benefits and characteristics:

- **Non-intrusive:** Banks typically operate several large legacy platforms in each different business vertical making it very complicated, time-consuming and expensive to connect them all together into one cohesive IT system . The non-intrusive RPA software helps banks achieve automation without the need for complex system integration.
- **24/7 support:** Unlike humans, an RPA bot can operate continuously without a drop in efficiency and accuracy levels. By leveraging RPA, banks can achieve productivity gains of 35-50%-compounded across thousands of transactions-enabling greater capacity and agility.
- **Quick deployment:** An RPA tool can be deployment in 2 to 6 months depending on the complexity of the process.
- **Scalability:** RPA is code-free and thus easily implemented in departments because it does not require programming skills and business users can be trained easily to manage the bots
- **Detailed audit trail:** Anything performed by RPA can be recorded consistently thus providing a solid audit trail and data pool. These key analytics can be used to optimize processes, improve the customer experience, generate performance statistics and even use for efficient regulatory reporting.

With the above benefits in mind, banks have tested this technology across the various functions and with varying levels of complexity. Early implementers were really focused on large enterprise functions, reconciliation, data management, high volume repeatable processes. However, banks are now using RPA in more complex processes such as risk and compliance, data quality testing, financial crime sanctions check, etc.

Global Robotics Process Automation Market in 2017	\$443 Mn	Projected CAGR for next four years	35%
\$1.2 Bn	Expected RPA Market by 2021	30+%	Potential ROI in 1 st year due to new development in business automation
Global RPA Market Solution Providers	113	30%	Solution Providers to grow at CAGR
330	Global RPA Market Service Providers	Service Providers to grow at CAGR	37%

Applications of RPA



Challenges for Banks when deploying RPA

While robots in RPA are super-efficient they are not without flaw. A software robot can make errors when it receives the wrong data from humans. The error will be repeated until it is manually eliminated. At the end of the day, robots are only instructions based on a programmed algorithm to imitate humans by doing things in the same way; hence they cannot make autonomous decisions in cases of unusual situations.

Therefore, RPA requires constant monitoring and control, corrections of the algorithm and completion of process paths. Any change in the system in which robots move, directly affects the work of robotic agents. Banks must necessarily distinguish between processes that can be completely automated and processes which require human intervention and apply the technology accordingly. An ideal deployment will involve a mix of attended and unattended RPA processes.

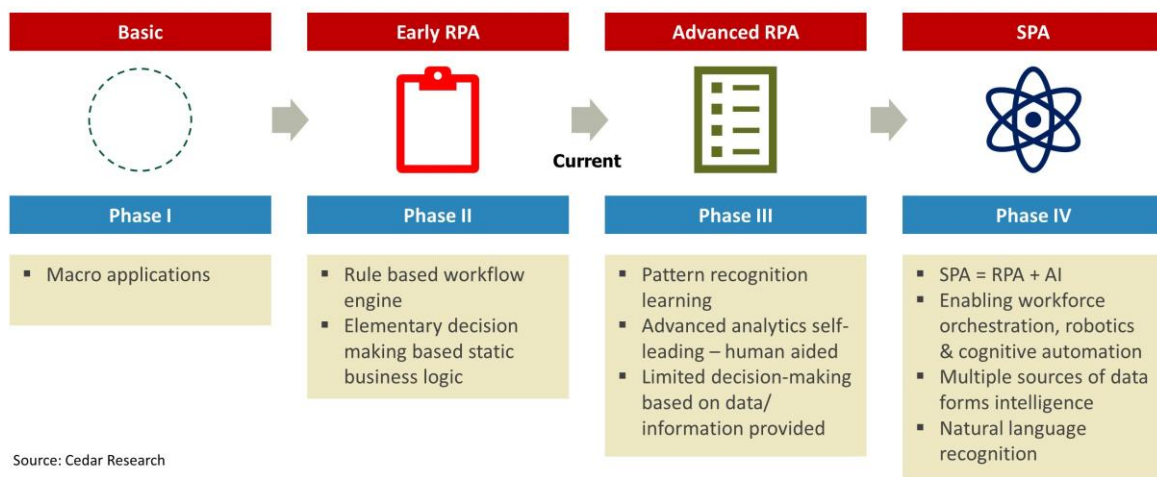
Future state of RPA

The true goal of any process optimization is to achieve complete automation. This is the end goal even for banks, as they scale up their RPA technology across operations. However, as processes get more complex, the level of decision making involved and cognitive capability required becomes higher. Banks have realized that the true potential of RPA is realized only when the technology is combined with AI and machine learning to make the automation more cognitive and cross functional. Fintech suppliers of RPA solution are already experimenting with this model of combining AI with RPA.

"Rules-based automation is short lived; that's not where the value proposition is. It's in RPA plus cognitive computing plus advanced analytics plus work-force orchestration ¹..."

**Head of Innovation Lab
at Deutsche Banking**

Evolution of Robotic Process Automation



Source: Cedar Research

SPA = Smart Process Automation

II. Artificial Intelligence (AI)

Artificial Intelligence and machine learning technologies are expected to have a transformative impact on the banking industry. The power of mimicking human thought has applications across numerous business areas within banking, including customer services, operations, risk and compliance, investment and trading, and cyber-security.

There is no argument that Artificial Intelligence is going to disrupt the banking industry just as it is disrupting other industries.

Last year saw many of the large banks, both in Europe and the US announce AI related initiatives and investments. JP Morgan reportedly invested over \$9.5 billion in technology in 2016 with a large part being spent in robotics and AI to automate processes and cut costs. Similarly, HSBC recently announced that it spent \$2.3 billion on improving its artificial intelligence (AI) and digital capabilities around the globe.

However, in spite of the hype and AI related initiatives making the news, banks are still in the process. A recent survey by SAS on adoption trends of AI in Europe revealed that while organizations were optimistic about the benefits of AI, very few were confident of exploiting the technology. Two reasons stood

*JP Morgan estimates that AI will account for **1.8% of global enterprise IT budgets by 2021** up from **0.3% in 2016**²*

out as impediments to adopting this technology - the shortage of data science skills to maximize value from emerging AI technology and the lack of the right infrastructure for deployment.

Another survey of the 200 global tier one and tier two banks revealed that while 67% have actively deployed AI and machine learning the vast majority are still unaware of how to apply the technology to solve business problems.

It is evident that AI and machine learning technology is disruptive in its ability to provide cognitive capabilities to rule-based robotic process automation technologies. Potential use cases of AI run across numerous applications including AI-powered chatbots to improve service and operations, intelligent algorithms to bolster security, trading, business analysis, or the intelligent automation of manual processes.

Currently the disruption is most evident in the areas of customer service and risk management. It is predicted that more than 60% of customer interactions will be handled by AI in the future.

Some of the more popular applications of AI in banking are as follows:

1. Fraud detection
2. Chatbots
3. Algorithmic trading and robo-advisers
4. Recommendation engine

1. **Fraud Detection:**

Banks are increasingly using big data and AI to detect anomalies and fraud right from initial KYC checks to the transaction processing stage. Most of the major banks across the globe are shifting from rule-based software systems to artificial intelligence-based systems which are more robust and intelligent to detect money laundering patterns on a real time basis.

Use Case #1

HSBC is incorporating technology from Ayasdi to tackle fraudulent activities such as money laundering and KYC. HSBC is focused on gaining efficiencies from automating transactional-data analysis, and like several other banking entities, it seeks to gain a significant reduction in cost by eliminating false positives in fraud detection. It has already seen a 20-percent efficiency gain in initial pilots.³

Use Case #2

Citibank has made a strategic investment in Feedzai, a leading global data science enterprise that works in real-time to identify and eradicate fraud in all avenues of commerce including online and in-person banking. Feedzai's technology is built using machine learning and artificial intelligence that adapts with the detection of new malicious threats at scale, helping business customers make data-backed decisions and de-risk commerce transactions in real-time.⁴

2. **Chatbots:**

This is the most sought after application for AI considering the benefits that banks will gain once a chatbot is successfully deployed. Chatbots are a cost-efficient, yet powerful way to provide basic support for customer queries all through the day 24/7 without the need for customers to be in queue. Chatbots excel at collecting customer data from support interactions and allow live support agents to use this information to personalize their interactions with customers.

Use Case #1

The Royal Bank of Scotland (RBS) is using a chatbot called Luvo to automate and streamline its on-line customer service. Developed using IBM's artificial intelligence platform Watson, Luvo handles simple customer questions, freeing up the bank's customer support staff to focus on more difficult customer issues.⁵

Use Case #2

Bank of America introduced its chatbot, Erica, in 2016. The chatbot leverages "predictive analytics and cognitive messaging" to provide financial guidance to the company's over 45 million customers. As an integrated component of the mobile banking experience, Erica is designed to be accessible to clients 24/7 and perform "day-to-day transactions" in addition to anticipating the unique financial needs of each customer and helping them reach their financial goals by providing smart recommendations.⁶

3. Algorithmic trading and robo-advisers:

The success of Wall Street traders using algorithmic or quantitative trading models has been widely publicized. With advancements in AI and machine learning, banks and financial institutions are taking it up another notch by replacing human traders with AI based software robots. JP Morgan’s asset management business recently reported that it is working on a new machine learning software model that the firm hopes will make more efficient and profitable trades than its human counterparts are capable of.

On similar lines is the introduction of robo-advisers in wealth management. While fintech start-ups have been offering this service for a while now, leading banks such as UBS Group, Wells Fargo and Citizens Bank have also launched their own robo-advisory solutions which give customers access to their portfolio and offer support and customer service through chatbots, again cutting the cost traditionally associated with wealth management services.

Use Case #1	ING unveiled a new artificial intelligence bond-trading tool, called “Katana.” The system will be rolled out across the bank in 2018, promising to cut costs and speed up transactions. Katana learns from the history of hundreds of thousands of trades and translates this into a prediction or suggested decision for the trader when deciding what price to quote when a client wants to buy or sell a bond. ⁷
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4. Recommendation Engines:

Personalizing the customer's journey is a highly effective way of improving their experience and satisfaction, showcasing key initiatives and driving traffic numbers. With increasing digitization by banks and the explosion of data online, these engines are able to utilize data science and machine-learning to offer suggestions for related products, new offers and other 'discovery' paths.

Use Case #1	In 2017, JP Morgan announced the development of a machine learning based application called ‘Emerging Opportunities Engine’ to be used in its Investment Banking Business. The helps identify clients best positioned for follow-on equity offerings through automated analysis of current financial positions, market conditions and historical data. The technology has proven successful in Equity Capital Markets and is currently being expanded to other areas including Debt Capital Markets. ⁸
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Challenges for Banks in adopting AI

While the huge benefits of using AI are well acknowledged by banks, they still have to navigate through a few hurdles which could slow down the adoption process.

Privacy Issues	01 <ul style="list-style-type: none">• With growing availability of information across the web, customers and users are continuously at threat from privacy issues and data theft• Due to the gamut of sensitive information of customers available in banking, frauds and data thefts are a big concern• More than one third of firms see data privacy as a hurdle in adopting AI
Compatibility & Skillset	02 <ul style="list-style-type: none">• The burden of legacy systems and data silos weighs down on banks looking to implement AI• Leading banks across the world are struggling to understand AI and incorporate into their existing IT architecture• Banks are also finding it hard to find the right talent for the job
Human Interaction	03 <ul style="list-style-type: none">• AI is believed to replace human interaction with the use of chatbots and virtual assistance for client requests and questions• Around one third of the firms see preference towards human interaction as a hurdle in using AI• There is also research from employees due to fear of job losses

3

Key Strategy Considerations for banks while deploying RPA and AI technology

Like in all new age technologies, while benefits of deployment are immense, deploying the technology in the right manner is critical for an organization to maximise its potential benefits.

Some of the key imperatives for banks to consider when deploying RPA and Artificial Intelligence is as follows:

Identifying the right processes to automate:

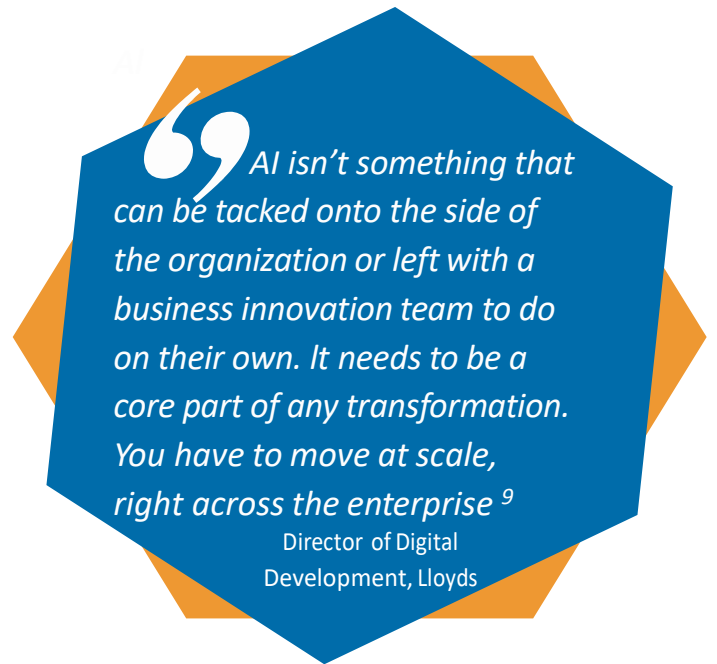
One of the biggest errors that financial institutions commit with their decision to automate processes is to carry out blanket automation. It is critical for banks to identify processes that will have the most impact from the automation exercise. Otherwise banks could end up spending on automation exercise which may not yield the expected ROI.

Management buy-in:

The most important hurdle when implementing any new technology is to get a buy-in from key function owners across the organization, especially top management including the CXOs and Head of critical departments such as IT and Operations. Usually such initiatives are faced with resistance from most departments due to fear of job losses and the general inertia associated with any change. In some instances, these initiatives are considered to be the domain of the IT department and don't get much cooperation from the other departments. In such a situation, technology gets developed in silos and setting up a Centre of Excellence (CoE) team, that is required to deploy the technology across the organization, becomes a challenge.

Upgrading legacy systems:

Most banks have the same problem when it comes to deploying new technology - the cost problem because of huge legacy systems which require hardware maintenance, software licenses and integration costs. The solution is a new platform with web scale features. A key imperative for banks to successfully deploy and benefit from intelligence operations will be to first upgrade legacy systems. Intelligent operations entail the use of advance technologies such as AI and RPA and layering these technologies on legacy systems will not allow banks to realize the true benefits of the implementation.



Selecting the right partner:

The right man for the right job applies most when it comes to selecting a technology supplier. Banks must first internally establish the objective and areas that they want to automate and pick a supplier who is strong in that particular area. Factors a bank must consider while selecting the right supplier includes the geographic location of the supplier, quality of technical support available during and post implementation, past implementation track record, customer references and of course the cost of implementation amongst others.

Regulatory compliance:

Automation of banking processes mainly involves customer data and any action that impacts customer data must be re-viewed carefully, as any misreporting or leakage of customer data can lead to regulatory action. Hence it becomes imperative for banks to ensure that the data that is automated is compliant with current and upcoming regulations.

4 | Outlook for AI and RPA in Banking

The goal of RPA and AI based technologies is to reduce the repetitive work done by humans thereby allowing people to concentrate on more complex and creative tasks that machines can't handle such as maintaining customer relationships. Banks have acknowledged this opportunity and are already moving in the right direction with the larger banks and neo banks leading the way.

The future state of a banking operation is most likely to be completely automated, with human intervention only involved in critical decision making aided by insights and recommendations from AI enabled technology.

While RPA has reached a relatively mature state of adoption within banks, AI applications are still the bastion of large banks and of course the growing breed of neo banks and challenger banks. For tier two and tier three banks, AI is still in the ideation stage with many still unable to leverage the technology due to legacy systems and manual processes.

But the path has been set, with many banks upgrading their core systems and serious discussions in the board room on investing in and adopting emerging technologies.

The industry wide uptake of AI however will take a while, considering the various elements required in the successful

“Robotics, AI, & Data are three technologies to watch out for. While these technologies continue to mature it's the ability to leverage the convergence of these capabilities that will influence significant business outcome”¹⁰

Chief Technology Officer, Wells Fargo Group

deployment and evolution of AI technology. A key concern amongst industry exponents and employees alike is the loss of jobs due to these deployments. Banks and other organizations are trying their best to allay these fears by consistently reassuring through messages that their goal for AI is not to replace human employees, but to help them do their jobs better.

With studies indicating that spending in cognitive technologies worldwide will grow by more than 50% for the next three years, AI is expected to be the secret ingredient for any bank expecting to compete in the market. At the end, the most successful banks will be the ones who are first in the market and deploy the solution in a holistic manner rather than for individual processes and build around a customer-oriented strategy.



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