

Robotic Process Automation in Banking

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ABSTRACT

Banks today are under pressure to handle massive data, strict regulations, and rising customer expectations. They face the difficult task of streamlining operations and reducing costs while enhancing the customer experience. Robotic process automation in banking helps solve these challenges by automating repetitive workflows and improving accuracy across operations. It uses software bots to carry out repetitive, rule-based digital tasks much like a human employee. It transforms how institutions manage tasks, data, and compliance, driving efficiency across the entire organization. This paper explores how RPA in banking is revolutionizing financial operations by automating routine tasks, improving compliance, and enhancing customer experience.

KEYWORDS: *automation, robotic process automation, RPA, automation, banking, banker, banking industry.*

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INTRODUCTION

The banking industry is in the midst of digital disruption. It is facing numerous challenges and operational inefficiencies over the past few years, including lengthy customer onboarding processes, cumbersome know your customer (KYC) compliance, and high operational costs. Bank staff manage an enormous flow of customer data every day, and manual handling often increases the risk of mistakes. Manual processes in banking often lead to slow operations, higher costs, and frequent human errors. Repetitive tasks such as data entry, validation, and reconciliation leave room for errors that can cause issues like fraud or compliance failures.

Robotic process automation in banking eliminates this vulnerability by executing these actions consistently and accurately, reducing operational risks. It is a software robot technology designed to execute rules-based business processes by mimicking human interactions across multiple applications. Instead of employees manually verifying and transferring information, bots process it within seconds. Applying RPA in banking, organizations not only cut costs but also allow their teams to concentrate on strategy,

customer relationships, and innovation [1]. Figure 1 provides a definition of robotic process automation [2], while Figure 2 shows a bank professional [3].

WHAT IS ROBOTIC PROCESS AUTOMATION?

The term “robotic process automation” (RPA) appeared relatively recently, but the phenomenon itself has been around for a long time. Among the various forms of artificial intelligence, RPA stands out for its potential to significantly increase workforce productivity by reducing or eliminating the need to do repetitive tasks manually. Popular applications of RPA include data entry, data reconciliation, spreadsheet manipulation, systems integration, automated data reporting, analytics, email notifications, acquisitions, administrative services, finance, human resources, mission assurance, strategic communications, travel reimbursements, claims processing, and customer outreach and communications. These are just a few examples of the ways RPA is being used to remove the burden of manual, repetitive, and duplicative tasks from public service workers [4].

Robotic process automation is a form of automation software. It is a technology that can automate repetitive, rules-based tasks. Like an Excel macro operating within a spreadsheet, RPA can record actions performed across a personal computer, access systems, and perform specific tasks for human users. It uses software robots, more commonly called “bots,” that mimic basic human-computer interactions. Figure 3 shows the symbol of RPA [5], while Figure 4 shows processes that RPA can automate [6]. Most industries use RPA. The government does too. Due to the repetitive nature of some tasks, the probability of human error increases. One way to eliminate errors is by using RPA.

Robotic process automation solutions fall into three key categories: attended RPA, unattended RPA and hybrid RPA, as shown in Figure 5 [7].

Robotic process automation is a type of software that mimics the activity of a human being in carrying out a task within a process. It is a technology that automates repetitive tasks using software robots. RPA uses a set of automation tools to automate repetitive tasks and manual processes performed electronically. Since RPA can automate tasks that are rule-based, manual, repetitive, and tedious, delivering the highest levels of accuracy and eradicating human errors, it is a seamless fit for the finance industry. Here are some specific examples of what RPA in finance can do [8]:

- Opening emails and joining attachments
- Automatically logging into various applications on the web
- Shifting folders and files
- Copying and pasting
- Completing forms
- Collecting data from databases and the web
- Making calculations
- Connecting to system API
- Extracting structured data from documents
- Gathering stats from social media
- Following if/then decisions and rules

Some of these tasks are displayed in Figure 6 [7].

At its core, robotic process automation (RPA) is a tool designed to mimic rule-based business processes, performing them seamlessly and without fatigue. RPA is a rule-driven method that is limited in its application. The technology functions much like a Microsoft Excel macro; the key difference is in power and reach. It follows set rules, similar to how an Excel macro works, to do things like move files or log into accounts. Growing as a popular solution in finance and accounting, RPA refers to software technology or “software robots” with artificial intelligence (AI) and machine learning (ML) capabilities. The “software robots” have the ability to

learn and complete a high volume of rules-based, repetitive tasks, and business processes. They have the capacity to operate much faster than humans, with 100% precision and reliability, working around the clock.

Finance and human resources are just two examples of departments likely to have many use cases that RPA can help solve. Some examples of good use cases for RPA in finance include processing customer orders, ensuring timely vendor payments, and managing period ending financial close processes. For human resources, some examples include employee onboarding, time tracking, and leave of absence management. Processes where human judgment is needed are not appropriate for RPA since RPA automations rely on clear, consistently applied rules [9].

Along with RPA, one should be aware of both business process automation (BPA) and digital process automation (DPA) – two commonly used automation technologies that robotics process automation can be paired to optimize and streamline a digital transformation. BPA refers to the use of technology to automate complex, multi-step workflows, typically very specific to a company’s core business functions. DPA offers dual power by automating processes from end to end, and optimizing common workflows that involve external human interactions (i.e. sales, management). Separately, RPA and AI are quite powerful, but leveraging them together is undoubtedly advantageous to any financial institution. When deployed together, AI is the “brains” behind RPA’s bots [10].

ROBOTIC PROCESS AUTOMATION IN BANKING

Robotic process automation in banking involves using business process automation tools to automate various administrative, customer service, and data handling tasks, allowing employees to focus on more value-adding and customer-centric activities. It has become a key driver for improving efficiency across financial operations. In the banking sector, it automates repetitive and rule-based processes, freeing staff to focus on customer engagement, innovation, and compliance oversight. In the RPA in banking model, bots act as digital assistants across the front, middle, and back offices. They handle a wide range of functions, from customer onboarding and compliance checks to account reconciliation and data management. This allows banks to maintain consistency, speed, and accuracy even with large volumes of daily operations.

RPA in banking refers to the use of software robots to automate repetitive, rule-based processes within

financial institutions. Banks use RPA to tackle challenges such as labor-intensive processes, compliance with complex regulations, and the growing need for seamless customer experiences. Rolling out robotic process automation in banking requires a structured and well-planned approach. The goal is to identify repetitive processes, design automation workflows, and integrate them safely across systems without disrupting ongoing operations. Common areas for automation include account reconciliation, loan processing, compliance checks, and data validation. Figure 7 shows robotic process automation in banking [1].

APPLICATIONS OF ROBOTIC PROCESS AUTOMATION IN BANKING

Figure 8 shows top use cases of RPA in banking [11]. Banks are increasingly deploying RPA in the banking sector for critical operations such as customer onboarding, know your customer (KYC) verification, loan processing, and fraud monitoring. Common applications of RPA in banking include the following [1,12,13]:

- *Customer Support Automation:* Banks handle thousands of daily customer requests, from balance checks and account updates to loan application tracking. Managing this volume manually often leads to delays and long response times. That is where robotic process automation examples in banking make a real difference. With bots integrated into customer service systems, queries can be handled instantly. These digital assistants access data in real time, answer frequently asked questions, and even process routine requests within seconds.
- *Accounts Payable Automation:* The accounts payable function often involves repetitive steps such as reading invoices, validating vendor details, and releasing payments. While essential, this task consumes valuable time that could be directed toward higher-value activities. With RPA automation in banking, these workflows can be streamlined effortlessly. Bots can extract data from scanned or digital invoices, verify the details against internal databases, and initiate payments automatically.
- *Credit Card Processing:* Traditional credit card application processing used to take weeks to validate the customer information and approve credit cards. Staff had to manually validate customer details, review documents, and perform background and credit checks, leading to delays and higher operational costs. With robotic process automation in banking, these tasks are now completed within hours. Bots interact with several internal and external systems simultaneously to collect and verify customer data, assess eligibility, and make rule-based decisions on approval or rejection.
- *Mortgage Loan Automation:* Mortgage approvals are among the most time-consuming processes in the financial industry, often taking over 50 days to finalize in some markets. Each application requires multiple verifications, including credit score analysis, employment confirmation, and document validation. Through robotic process automation in lending, banks can drastically cut this timeline. Automated workflows handle the necessary verifications quickly, detect missing details, and flag potential issues for human review.
- *KYC Automation:* The Know Your Customer (KYC) process is essential for verifying client identities and preventing illegal activities like money laundering or fraud. Traditionally, banks dedicate hundreds of employees to handle these checks, resulting in high operational costs and long turnaround times. By implementing robotic process automation in banking industry operations, institutions can streamline KYC verification with precision and speed. Bots automatically extract and validate customer information from multiple databases, confirm document authenticity, and update records with minimal manual input.
- *Report Automation:* Like all other public companies, banks need to prepare reports and present them to their stakeholders to show their performance. Accurate reporting is an essential responsibility for financial institutions. From regulatory submissions to internal performance summaries, every report must be precise and delivered on time. Traditionally, preparing these reports involves gathering data manually, which increases the risk of inconsistencies. With robotics in banking, report generation becomes nearly instantaneous. Bots can extract information from multiple databases, auto-fill report templates, and format data according to regulatory requirements.
- *Underwriting Assistance:* Underwriting is the process of assessing the risk of financial transactions such as bond issues, bank loans, and insurance policies. Traditionally, this process demands extensive manual effort to gather, review, and analyze data from multiple systems. With robotic process automation in banking, the entire workflow becomes more efficient and data-driven. Automated systems collect and cross-

check information, evaluate risk profiles, and feed results into decision models, minimizing human bias and manual error.

- *Cash Collection and Deposit Automation:* Cash collection and deposits is another challenge that banking and financial organization often struggle with. Managing cash collection and deposits across multiple branches and points of sale can be a complex and error-prone task. Manual tracking often leads to inconsistencies, delayed reconciliations, and potential security issues. By implementing robotic process automation in banking, financial institutions can streamline this process and strengthen control. Bots automatically consolidate transaction data from various locations, validate it, and record it into a centralized system in real time.
- *Account Origination Automation:* Account origination is a time-consuming process ranging from application and underwriting to disbursement of funds. The account origination cycle, from customer application to approval and fund disbursement, typically involves numerous manual steps and validations. Staff must review pre-qualification documents, verify credit histories, and coordinate underwriting and funding approvals. With robotic process automation in banking sector operations, these tasks can be handled efficiently and with fewer errors. Automation eliminates repetitive data entry, ensures consistency across systems, and keeps every stage compliant with regulatory standards.
- *Customer Onboarding:* Manual onboarding slows down account activation, introduces compliance risk, and frustrates new clients. One of the most common RPA use cases in banking is customer onboarding. This process verifies know your customer (KYC) documents; conducts credit history checks and sets up accounts. RPA bots enhance the process by reducing turnaround time from days to minutes.
- *ATM Reconciliation:* In robotic process automation banking examples, bots automate the comparison of ATM transaction logs using backend records, drastically reducing reconciliation time and minimizing the risk of human error in financial reporting.

BENEFITS

The benefits of robotic process automation in banking extend far beyond cost savings. It improves accuracy, scalability, compliance, and customer experience, giving financial institutions stronger control over

daily operations and long-term growth. Other benefits of RPA in banking include the following [1,14,15]:

- *Automation:* The industrialization process has led to the automation of business processes with the goal of economic efficiency. In 1946, the term “automation” was coined. Now we can see that it has immensely impacted our lives, not a single day goes by without making use of it. Automation helps boost business, improve customer satisfaction, and relieve staff. RPA software often works alongside AI, OCR, and NLP to form a broader intelligent automation strategy.
- *Scalable Operations:* Bots can handle large workloads effortlessly. When transaction volumes rise, additional digital workers can be deployed within minutes to manage demand. This scalability ensures banks stay responsive during peak hours while freeing employees to focus on innovation and business development.
- *Process Efficiency:* Once properly configured, AI automation boosts speed and consistency. Tasks that once took hours now finish in minutes, improving productivity and turnaround times across departments.
- *Cost Efficiency:* With reduced manual involvement, institutions can cut processing expenses by 25–50%. The shift to robotic process automation in banking helps teams accomplish more with fewer resources, ensuring financial sustainability.
- *Labor Cost Reduction:* By automating repetitive functions, banks cut operational costs while reallocating human expertise toward advisory and strategic roles. This measurable saving strengthens return on investment for every robotic process automation in banking industry projects.
- *Account Reconciliation:* Manual reconciliation often slows month-end closing. RPA in banking matches transactions, detects mismatches, and generates error-free reports. Banking process automation shortens reconciliation cycles from days to hours.
- *Regulatory Compliance:* Since the financial system operates under strict oversight, ensuring adherence to legal and industry standards is non-negotiable. Automating compliance processes through robotic process automation in banking helps institutions maintain accuracy and transparency while reducing manual workloads. In fact, many experts recognize automation as a strong enabler for improved governance and faster reporting.

- *Availability:* Unlike human staff, bots work nonstop. Bots run continuously without breaks, enabling banking process automation to maintain uninterrupted performance for functions such as transaction monitoring, statement reconciliation, and overnight reporting. Their 24/7 performance guarantees consistent accuracy and uninterrupted service delivery, even outside business hours.
- *Quick Deployment:* Modern AI automation tools use drag-and-drop functions that allow rapid setup without complex coding. Banks can launch, test, and scale new workflows within days, not months.
- *Integration with Legacy System:* The unique benefit of RPA in the banking sector is that software robots can be easily implemented into existing banking systems, allowing companies to modernize their IT infrastructure without revamping legacy core systems. Through intelligent data integration, automation connects old and new systems seamlessly. The bots interact with existing systems to move data, update information, verify documents, and complete structured workflows with high accuracy. This enables teams to unify records, generate insights faster, and make informed decisions that fuel steady business growth.
- *Fraud Prevention:* As banking becomes increasingly digital, fraud detection has become a top priority. Monitoring thousands of transactions manually in real time is nearly impossible, leaving room for suspicious activity to go unnoticed. Through robotic process automation in banking, institutions can identify irregular patterns instantly and flag high-risk transactions before damage occurs.
- *Security Concerns:* Poorly designed RPA workflows can risk sensitive data and create vulnerabilities. This highlights the importance of strong governance to ensure everything runs safely and effectively.
- *Over-reliance on Automation:* Excessive automation without human oversight can lead to blind spots, particularly when handling exceptions or non-standard cases, potentially resulting in overlooked errors, customer dissatisfaction or compliance risks.
- *Workforce Disruption:* While RPA creates new roles in IT and automation management, it may also displace roles in operations, creating resistance or morale issues among staff who fear job loss or lack clarity on evolving responsibilities.
- *Maintenance and Updates:* Bots are not fire-and-forget tools. They require active monitoring, updates, and performance reviews—especially in fast-changing environments. Bots need ongoing updates and monitoring to remain functional as systems, processes, or regulations change, ensuring they continue to operate accurately, securely and in compliance with evolving industry standards.
- *Resistance to Change:* Resistance to change remains one of the most common hurdles that companies face during RPA adoption. Employees get accustomed to the customary way of doing daily tasks and often cannot admit that a new approach is more effective. As soon as it becomes clear that RPA implementation is the right business strategy, banks need to create comprehensive change management programs to help employees shift their mindsets and make the transition as smooth as possible.

Some benefits of RPA in banking are displayed in Figure 9 [11].

CHALLENGES

In spite of the numerous benefits RPA can bring and its comparatively undistruptive implementation, adopting this technology is not easy. For example, the loan origination process relied heavily on manual document reviews and multi-step data validation, leading to lengthy approval cycles and inconsistent risk assessments. Other challenges of RPA in banking include the following [13,16]:

- *Implementation Complexity:* Deploying RPA at scale across legacy banking systems can be complex and resource-intensive, often requiring significant integration efforts, staff training and ongoing maintenance to ensure compatibility and performance.
- *IT Support:* IT departments often have too much on their hands to support RPA implementation. In this current age of digital transformation, bank IT departments are already spending considerable resources for the support and maintenance of existing IT ecosystems. While RPA is much less

resource-demanding than other automation solutions, it still requires the IT department's buy-in. That is why banks need to get support from IT personnel as early as possible.

Some challenges of RPA in banking are displayed in Figure 10 [11].

FUTURE OF ROBOTIC PROCESS AUTOMATION IN BANKING

As digital transformation accelerates, robotic process automation in banking industry is evolving from rule-based task execution to intelligent, connected systems that learn and adapt. The future of automation in banking will be defined by smarter tools, real-time insights, and greater collaboration between humans and machines. As the banking process automation market continues to expand, driven by AI and ML development, financial institutions that adopt RPA early will gain a clear competitive advantage. As automation becomes the core of digital transformation, now is the time to take action.

CONCLUSION

Robotic process automation (RPA) uses software bots to automate repetitive, rules-based tasks previously handled by humans. These bots replicate user actions within digital systems—click, type, copy, paste, extract data—without requiring changes to existing applications. RPA is becoming increasingly popular concept among all industries and the banking sector is not an exception. RPA in banking is implementing emerging technology to automate several repetitive processes in banks and financial institutions.

RPA in banking is redefining how financial institutions operate, helping them cut costs, eliminate errors, and deliver faster, more reliable services. It removes manual, repetitive tasks and replaces them with fast, precise, software-controlled workflows. Bots handle high-volume operations without fatigue or error. They cover loan reviews, KYC checks, compliance steps, and more, with full consistency and no downtime. Banks no longer treat RPA as an experiment. They now see it as essential infrastructure. RPA ensures 24x7 services and bank customers can get assistance anytime with the help of bank bots. More information about robotic process automation in banking can be found in the books in [17,18] and a related journal: *Journal of Banking and Financial Technology*.

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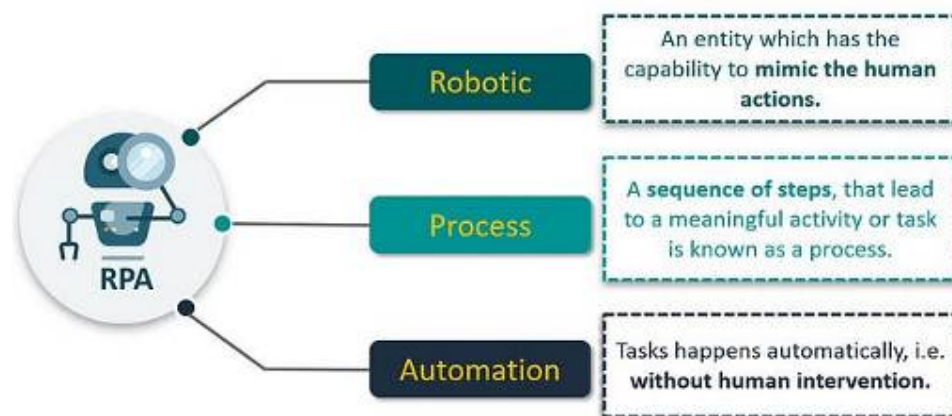


Figure 1 A definition of robotic process automation [2].



Figure 2 A bank professional [3].



Figure 3 Symbol of RPA [5].
Financial Processes that RPA can Automate

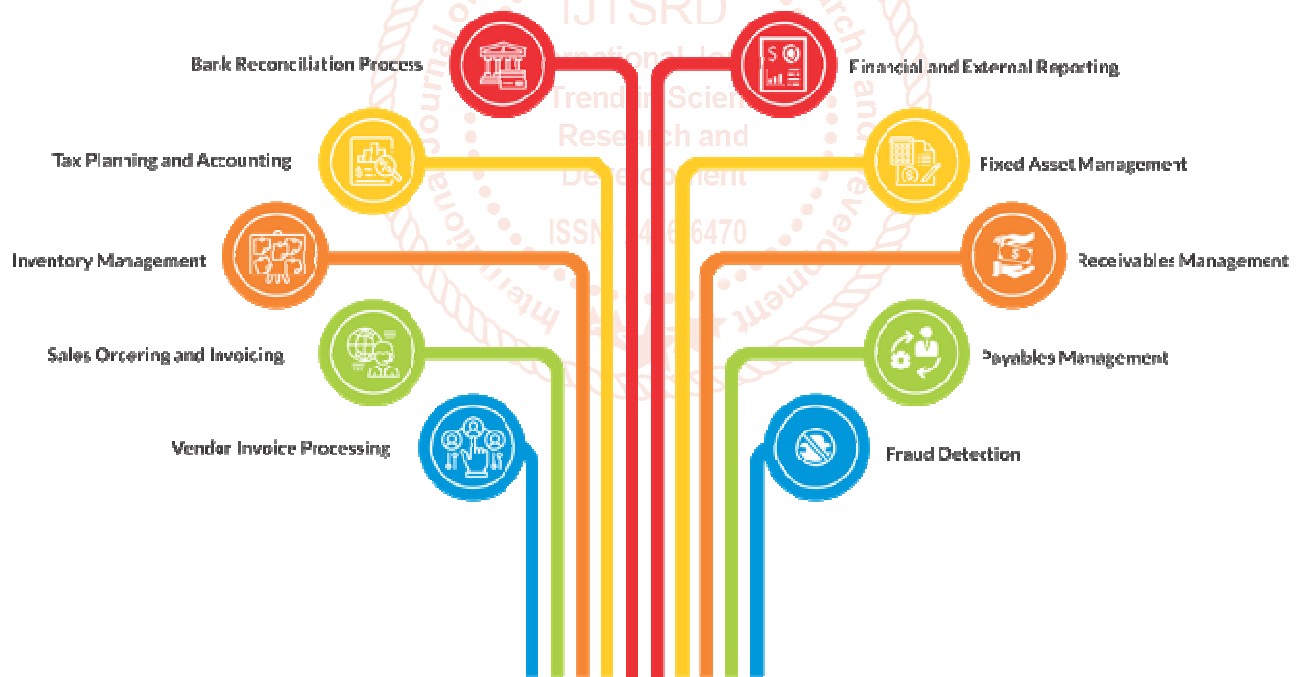


Figure 4 Processes that RPA can automate [6].

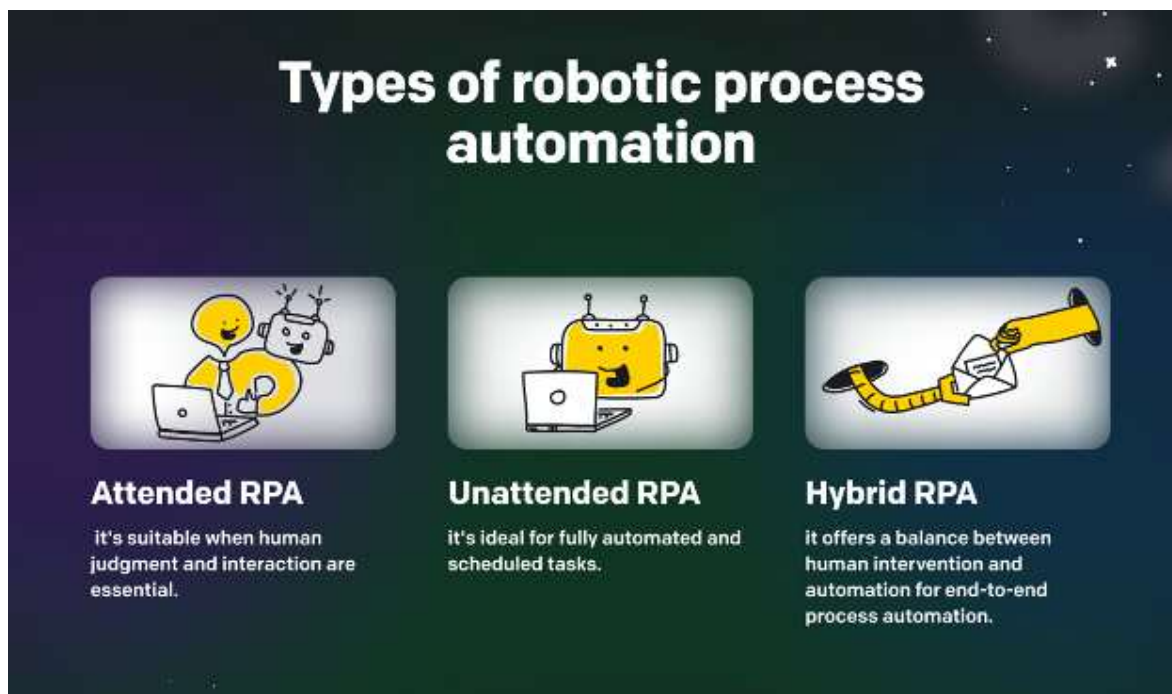


Figure 5 Three types of RPA [7].



Figure 6 Some tasks RPA can perform [7].

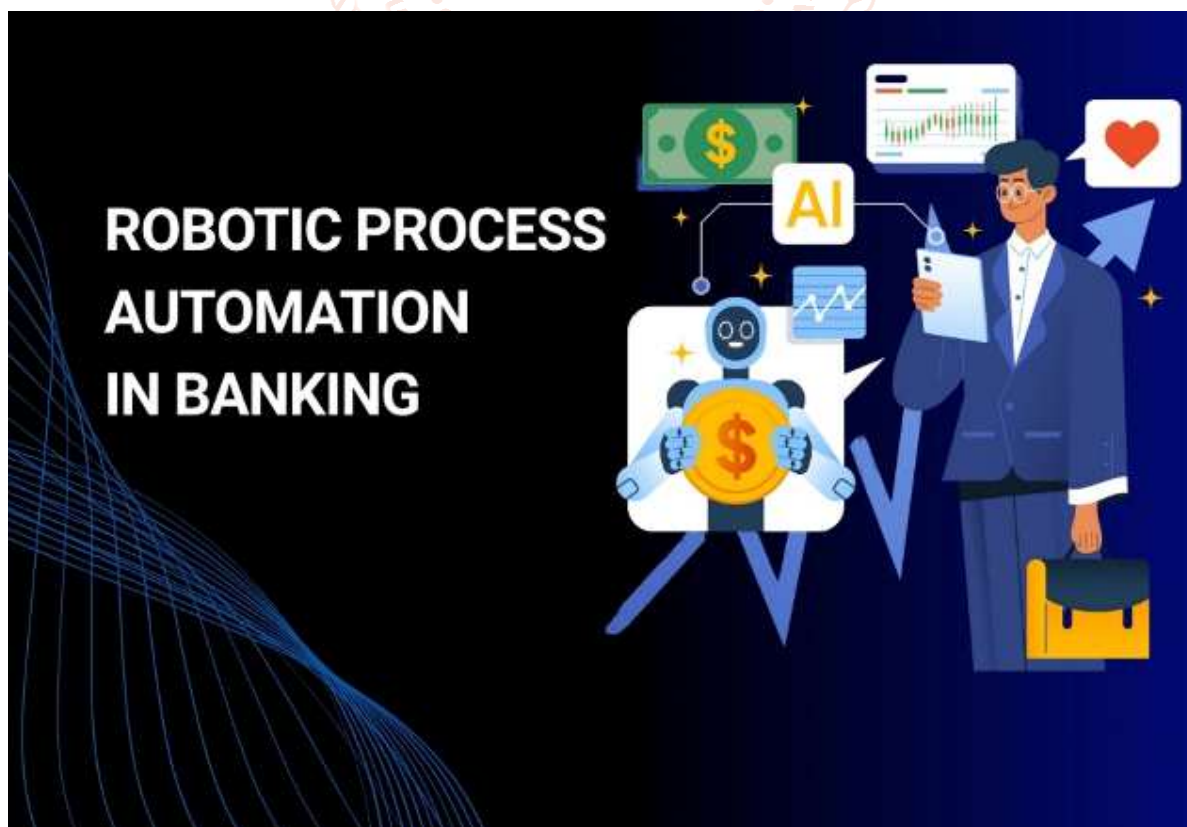


Figure 7 Robotic process automation in banking [1].



Figure 8 Use cases of RPA in banking [11].

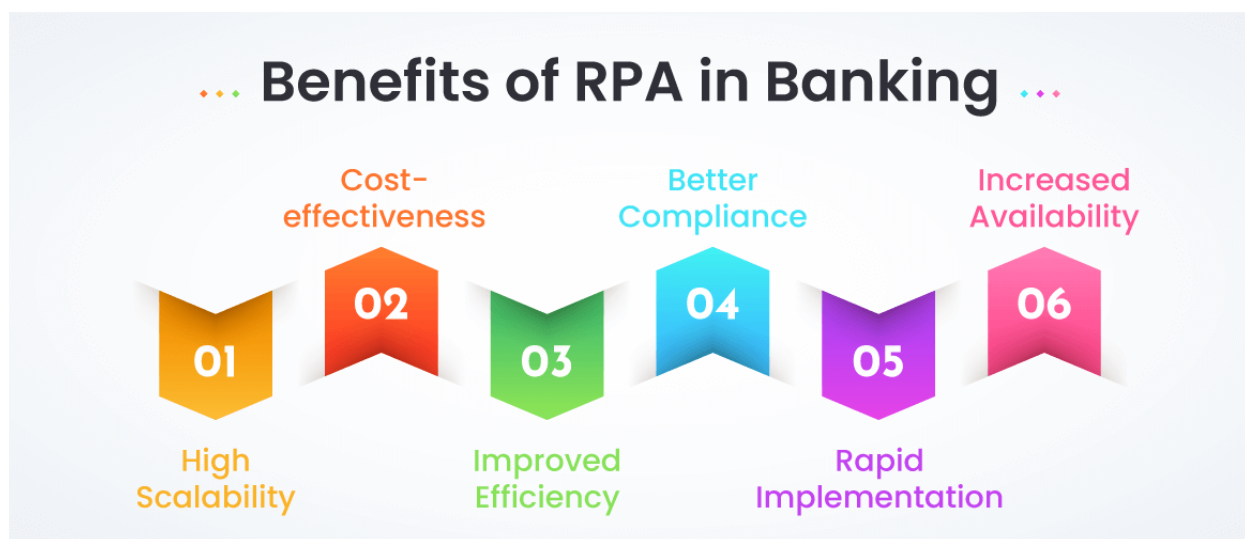


Figure 9 Some benefits of RPA in banking [11].

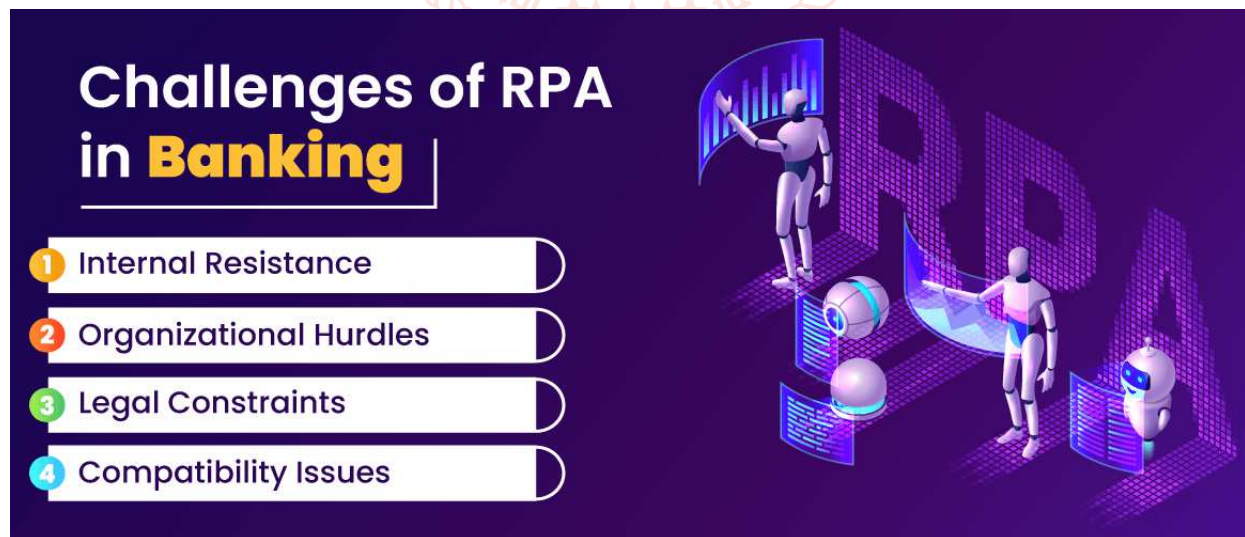


Figure 10 Some challenges of RPA in banking [11].