What is robotic process automation?

Robotic process automation (RPA) is a technology that mimics the way humans interact with software to perform high-volume, repeatable tasks. RPA technology creates software programs or bots that can log into applications, enter data, calculate and complete tasks, and copy data between applications or workflow as required.

When combined with AI and machine learning, RPA can capture more context from the content it is working with by reading text or handwriting with optical character recognition (OCR), extracting entities like names, invoice terms or addresses using natural language processing (NLP), and capturing more context from images, such as automatically estimating accident damage in an insurance claim picture.

RPA is growing in popularity because it can reduce costs, streamline processing and drive better customer experiences. Another attraction of RPA software is that business units can implement it without their having to learn new tools or ask IT teams for support -- and without changing an organization's underlying IT infrastructure.

As RPA has grown in popularity, however, enterprises are seeing the need to integrate RPA process automations in their IT systems. While RPA automations can dramatically speed up a business process previously handled by humans, bots can break when application interfaces or process workflows change.

Newer RPA tools use AI, machine vision and natural language processing to mitigate breakage problems. Modern RPA platforms also provide some integration with centralized IT governance and management capabilities, making it easier to scale the use of RPA across the enterprise.

How does RPA work?

RPA mirrors the way people are accustomed to interacting with and thinking about software applications. RPA's ability to copy the way humans perform a computer-based process has contributed to its popularity compared with automation tools such as application programming interfaces (APIs) or low-code development that are more scalable but less intuitive or require expert knowledge to use.

These six benefits of RPA can help companies achieve digital transformation.

The simplest RPA bots can be created by recording the clicks and keystrokes as a user interacts with an app. When problems emerge, a user can simply watch how the bot is connecting with the app and identify the steps that need to be fine-tuned.

In practice, these basic recordings often serve as a template for building more robust bots that can adapt to changes in screen size, layout or workflows.

More sophisticated RPA tools use machine vision to interpret the icons and layout on the screen and make adjustments accordingly.

Some RPA tools are also able to use these initial recordings to create hybrid RPA bots that start by simply recording an existing workflow and then dynamically generating a workflow automation on the back end. These kinds of hybrid bots take advantage of the simplicity of RPA development and the scalability of native workflow automation.

In other RPA implementations, process mining and task mining tools are used to automatically capture business process workflows that serve as starting templates for RPA automations. The process mining can analyze the logs of ERP and CRM applications, for example, to automatically generate a map of common enterprise processes. Task mining tools use a locally running app with machine vision to capture a user's interactions across multiple apps. All the major RPA vendors are starting to develop these kinds of process mining integrations.

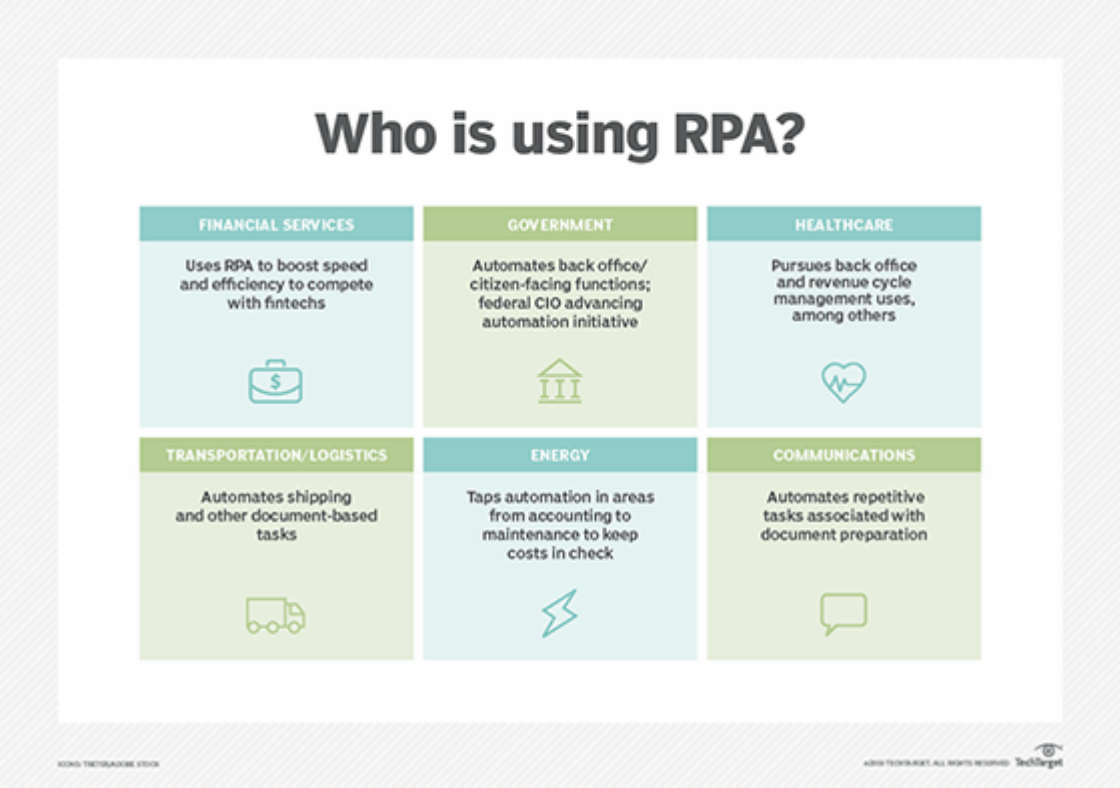
RPA tools can also be connected to AI modules that have capabilities like OCR, machine vision, natural langue understanding or decision engines, resulting in what is called intelligent process automation. These capabilities are sometimes packaged into cognitive automation modules designed to support best practices for a particular industry or business process.

Who is using RPA?

RPA is used in most industries, particularly those that include repetitive tasks such as insurance, banking, finance, healthcare and telecommunications.

RPA is used in finance to automate governance, reconcile accounts or process invoices.

RPA is used to automate various supply chain processes, including data entry, predictive maintenance and after-sales service support.



RPA is used across industries to automate high volume, rote tasks.

Telecommunications companies use RPA to configure new services and the associated billing systems for new accounts. Telco companies also use RPA to pull data from multiple systems when triaging equipment outages or predicting problems.

All the major systems integrators, including Capgemini, Deloitte, EY, Genpact, Tata Consultancy Services and Wipro, are using RPA to help build vertical applications that can make it easier for companies to adopt best practices in their niche.

What are the benefits of RPA?

Robotic process automation technology can help organizations on their digital transformation journeys by doing the following:

- enabling better customer service;
- ensuring business operations and processes comply with regulations and compliance standards;
- dramatically speeding up processing time;
- improving efficiency by digitizing and auditing process data;
- reducing costs by reducing manual and repetitive tasks; and
- enabling employees to be more productive.

RPA implementations can be challenging. Here are five pain points executive leadership must be prepared to address.

What are the challenges of RPA?

There are a number of challenges related to RPA, which have limited its use.

- **Scalability.** Enterprises have struggled to scale RPA automation initiatives because, although RPA's software bots are relatively easy to implement, they can be hard to govern and manage and therefore hard to scale.
- **Limited abilities.** While its name includes the words "process automation," many critics have pointed out that RPA software tools

automate tasks. More work is often required to stitch multiple tasks together into a process. Craig Le Clair, an analyst at Forrester Research, has cautioned enterprises to observe the "rule of five" in building RPA applications because they tend to break when a bot must make more than five decisions, manipulate more than five apps or make more than 500 clicks.

- **Security.** RPA bots sometimes need to access sensitive information to complete their tasks. If they are compromised, they pose an additional security risk for firms.
- **Limited resiliency.** RPA failures can occur when applications change in ways that are not anticipated by developers.
- **New QA issues.** Bots require a variety of new QA practices to ensure they continue to work as intended.
- **Privacy.** Bots may be involved in working with personally identifiable information governed by privacy requirements. Teams need to ensure this data is processed in conformance with local data protection laws such as GDPR. For example, if an RPA bot moved data outside of a given country without encryption that would be a violation of Article 44 of GDPR. RPA vendors are starting to seek ISO 27701 certification as a foundation for managing sensitive information.
- **Efficiency.** RPA bots manually plod through an application in the same way a human does. This may not be as efficient as automating applications through APIs or workflow automations baked into the application itself.

Applications of RPA

Some of the top applications of RPA include the following:

- **Customer service.** RPA helps companies provide better customer service by automating contact center tasks, including verifying e-

signatures, uploading scanned documents and verifying information for automatic approvals or rejections.

- **Accounting.** Organizations use RPA for general accounting, operational accounting, transactional reporting and budgeting.
- **Financial services.** Companies in the financial services industry use RPA for foreign exchange payments, automating account openings and closings, managing audit requests and processing insurance claims.
- **Healthcare.** Medical organizations use RPA for handling patient records, claims, customer support, account management, billing, reporting and analytics.
- **Human resources.** RPA can automate HR tasks, including onboarding and offboarding, updating employee information and time sheet submission processes.
- **Supply chain management.** RPA can be used in supply chain management for procurement, automating order processing and payments, monitoring inventory levels and tracking shipments.

Top RPA vendors

Listed in alphabetical order, the following are some top RPA vendors:

- ABBYY has long been a leader in developing OCR tools to streamline back-office applications. The company has recently expanded to help extend its automation capabilities across more use cases.
- Automation Anywhere provides an enterprise digital workforce platform geared toward procure-to-pay, quote-to-cash, HR, claims processing and other back-office processes.

- Blue Prism focuses on assisting organizations in regulated industries automate processes by offering desktop-aligned robots that are defined and managed centrally.
- Kryon provides full cycle automation capabilities including process mining, governance and AI modules that can extend RPA capabilities.
- NICE has traditionally focused on improving customer interactions with call centers and across multiple touchpoints. The company expanded its various automation capabilities to support RPA, with a strong focus on improving customer experience across multiple channels.
- Pegasystems has traditionally been a leader in business process management (BPM) tools but expanded into RPA with the acquisition of OpenSpan in 2016.
- UiPath offers an open platform to help organizations efficiently automate business processes.

What to look for in RPA software

When enterprise leaders look for RPA technologies, they should consider a number of things:

- **Scalability.** Enterprises are advised to select RPA platforms that can be centrally managed and scaled from a central control panel, rather than deployed and scaled on each desktop.
- **Speed.** Enterprises should be able to design and test new robotic processes in a few hours or less, as well as optimize the bots to work quickly.
- **Reliability.** As companies launch robots to automate hundreds or even thousands of manual tasks, they should look for tools with built-

in monitoring and analytics that enable them to monitor the health of their systems.

- **Simplicity.** Organizations should look for products that are simple enough that employees in the business can build and use them to handle various kinds of work, including collecting data and turning content into information that enables leaders to make the best business decisions.
- **Intelligence.** The best RPA tools can support simple task-based activities, read and write to any data source and take advantage of more advanced learning to further improve automation.
- **Enterprise-class.** Companies should look for tools that are built from the ground up for enterprise-grade scalability, reliability and manageability.
- **Governance.** Enterprises need to look at the various security and governance capabilities to help manage bot security credentials, assess any privacy issues and flag any issues.
- **Financial planning.** Tools for logging bot usage can help teams assess the ROI of existing bots and prioritize opportunities for new automation based on estimated value.

C-level decision-making around RPA

Though automation software will replace many jobs, others will be created for the people who maintain and improve RPA software.

When software robots do replace people in the enterprise, C-level executives need to be responsible for ensuring that business outcomes are achieved and new governance policies are met.

Robotic process automation technology also requires that the CTO or CIO take more of a leadership role and assume accountability for the business outcomes and the risks of deploying RPA tools.

Additionally, the COO, CIO and chief human resources officer, as well as the relevant C-level executive who owns the process being automated, should all work toward ensuring the availability of an enterprise-grade, secure platform for controlling and operating bots across systems.

The evolution of RPA

RPA is built on the success of macro technologies developed for automating manual tasks within applications like Excel. In the 1980s, these capabilities were extended to many enterprise applications using highly customized data-scraping applications. A number of testing tool vendors beefed up their automation capabilities at the turn of the century to help automate user interaction testing and load testing.

The actual term RPA was coined in 2012 by Phil Fersht, founder and lead analyst at HFS Research. The technology plodded along until about 2018 when it exploded in popularity as companies undertook digital transformation and RPA platform capabilities improved. Today it is one of the fastest growing categories of enterprise application automation.

Today, RPA software is particularly useful for organizations that have many different and complicated systems that need to interact together fluidly. For instance, if an electronic form from a human resource system is missing a zip code, traditional automation software would flag the form as having an exception and an employee would handle the exception by looking up the correct zip code and entering it on the form. Once the form is complete, the employee might send it on to payroll so the information can be entered into the organization's payroll system. With RPA technology, however, software has the ability to adapt to interact with the payroll system without human assistance.

The future of the RPA market is driven by hyperautomation

A Global Market Insights Inc. report expects the RPA market to reach $5 billion by 2024. The increased adoption of RPA technologies by organizations to enhance their capabilities and performance and boost cost savings are prime reasons for the expected growth of RPA.

Although RPA has been popular because of its simplicity, enterprises have struggled with scaling implementations. Gartner predicts that in the long run, RPA's growth will be accelerated using hyperautomation.

Hyperautomation efforts combine RPA with other kinds of automation tooling, including low-code and no-code development tools, BPM tools and decision engines. IPA and cognitive automation modules will make it easier to weave AI capabilities into these automations.

Process and task mining will help to identify new automations. Other AI governance tools will help enterprises manage the overall process for streamlining processes in ways that ensure trusted AI.

As hyperautomation takes hold, companies will need to develop a strategic approach to identifying and generating automation opportunities, and then managing the overall process across the enterprise. Some organizations have established an automation Center of Excellence to coordinate and scale automation projects.

Forrester research has predicted that the collective impact of these various types of automation technologies could help enterprises save $132 billion in labor value in the U.S. alone.

This was last updated in April 2021

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