

Evolution Of Robotic Process Automation (RPA)

The evolution of Robotic Process Automation (RPA) has been a dynamic journey shaped by advancements in technology, growing business needs, and a shift toward intelligent automation. Here's a breakdown of its evolution:

◆ 1. Pre-RPA Era (Before 2000) – Basic Automation

Technologies: Macros, screen scraping, and scripting.

Focus: Repetitive task automation using tools like Excel macros and early IT process automation scripts.

Limitations: Lacked scalability, required programming skills, and were brittle.

◆ 2. Early RPA (2000–2010) – Rule-Based Automation

Key Tools Emerge: Blue Prism, UiPath, Automation Anywhere.

Focus: Automating structured, rule-based processes in areas like finance, HR, and IT.

Features:

- Workflow automation.
- UI interaction (mimicking humans).
- Screen scraping improved with more robust tools.
- Benefit: Reduced manual effort, increased accuracy, and cost savings.

◆ 3. Growth Phase (2010–2017) – Enterprise Adoption

Adoption Widens: Enterprises begin to use RPA for digital transformation.

Key Innovations:

- Drag-and-drop automation interfaces.
- Centralized control rooms for managing bots.
- Scalability across departments.
- Industry Use: BFSI, healthcare, telecom, and retail.
- Challenges: Bots still dependent on structured data and fixed rules.

◆ 4. Intelligent Automation (2017–2020) – AI + RPA

Integration with AI/ML:

Natural language processing (NLP).

Computer vision.

Machine learning for decision-making.

Term: Intelligent Process Automation (IPA) or Hyperautomation begins to emerge.

Benefits: Automation of semi-structured/unstructured data tasks (e.g., emails, PDFs, voice).

Vendors Expand: M&A activity increases as traditional RPA vendors add AI capabilities.

♦ **5. Hyperautomation Era (2020–Present) – Ecosystem Expansion**

Definition: Gartner defines hyperautomation as the combination of RPA, AI, process mining, and analytics.

Key Features:

- End-to-end process orchestration.
- Real-time analytics and monitoring.
- Low-code/no-code development platforms.
- Cloud-native RPA platforms.

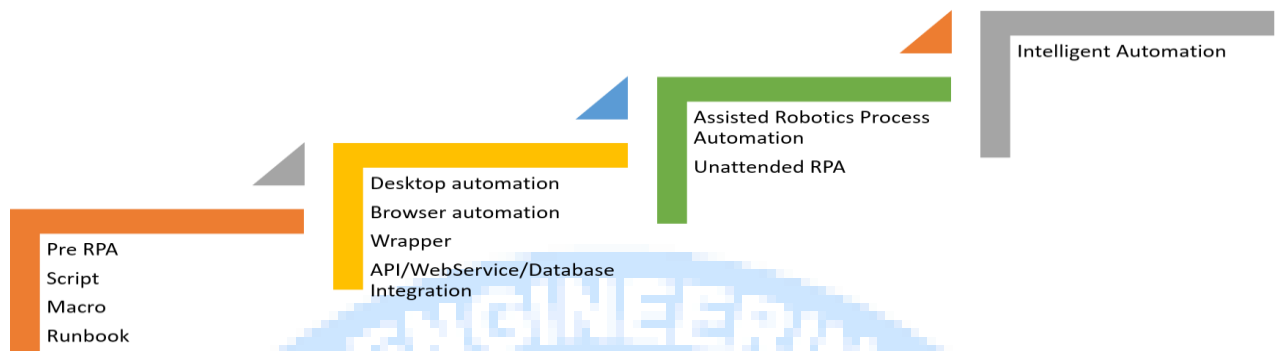
New Tools: Power Automate (Microsoft), Appian, ServiceNow RPA, and integration of RPA into ERP systems like SAP.

Trend: Shift from task-based automation to full process transformation.

♦ **6. Future of RPA – Cognitive & Autonomous Automation (2025 and Beyond)**

Predicted Trends:

- Increased use of Generative AI to handle dynamic and creative tasks.
- Autonomous agents that learn and adapt over time.
- Deeper integration with enterprise systems and business intelligence tools.
- Greater democratization: business users can build and deploy bots.



Techniques of automation

There are various techniques available for automation and programmers have been using them for years to increase efficiency in enterprises:

1. Custom software: Developing new software to perform repetitive tasks.
2. Runbook: Runbooks are typically used for IT-based operations. They are a compilation of a set of commands or tasks that are performed for maintenance and other types of activities. Runbooks can be offline as well, often referred to as run commands for performing sets of tasks.
3. Batch: Batch files used to very popular. They used to compile a sequence of commands that could be run by a single click or command. They can also be scheduled to be run at a specific time using the scheduler.
4. Wrapper: Wraps around existing software or hosts client applications. The wrapper monitors activities in a client app and performs actions based on rules.
5. For example:
6. Putting validation on top of a mainframe application using hummingbird
7. Hosting a website inside a shell, navigation, and actions
8. Browser automation: Grease monkey and many other web macro software helped in browser-based automation.
 - It can be used to read from a website and save to a database.
 - It can also write to fields based on rules.
 - Using this technique, a whole website can be changed, and components can be added or removed from the website. Sometimes, it is also referred to as web scripting or web injections.
9. Desktop automation: Traditionally, desktop automation used to mean that multiple screens on a desktop were woven together to present a single screen, and if there was some data transfer from one screen to another, it could be done automatically. Recently, assisted Robotics process automation has also been considered for desktop automation by some companies.
10. Database/web service integration: In database integration, we read/write to a client database directly. In web service integration, we communicate with the client system using a web service: