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Intelligent Automation
The Road Forward

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Introduction

Automation is ever evolving and has been a key focus area for most of the organizations. This evolution has sped up more than 5 times compared to last year due to the ongoing crisis.

Artificial intelligence is one of the major driving factors in this case. The power of AI adds intelligence to existing automation solutions and also creates new opportunities within this space. Though we want to dive into AI piece of automation, its quite impossible to do so without knowing how automation evolved.

Let us go through this evolution, various types of automation and journey towards Intelligent Automation.

2. Evolution

Automation yields benefits though, it's a gradual process as it also needs investments. Still, a majority of industries have adopted it over the years because it has worked as an enabler. Way back in 1940s the term Automation was coined in the scope of mechanization. The term mechanization means replacement of human or animal power with mechanical power. The intention was clear – Reduce the manpower and increase the efficiency.

Industries like automotive, food service, electronics manufacturing got the first-mover advantage in the field of automation as the aim was to increase efficiency and production. But when the first computer was programmed, no one wondered if there will be scope for automation. Thankfully, computing has evolved and come a long way to make it possible.
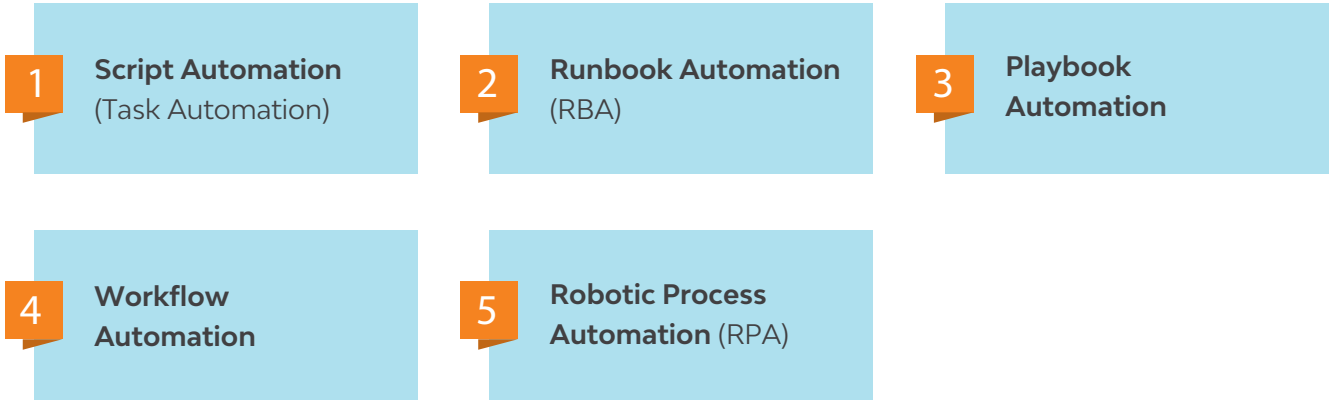
Infrastructure drives automation

Automation is entirely dependent on the underlying platform or architecture of any technology. Back in the 90s, there were mainframe computers with native technology, different vendors, and incompatible communication protocols. The only way automation was feasible was through the use of a native code, which was difficult to process and manage.

Slowly the servers allowed the release of key services like file and web service. Even then, the servers during that era typically gave local access to the administration using GUI and a native command line. Automation was approached in naïve ways – for example, using batch scripts placed inside the Windows environment and shell scripts in the Unix environments. As a result, automation was never centralized or controlled remotely. There were methods to connect to servers/ devices remotely, like Telnet being in existence since the 60s. But due to its underlying technology, it was never considered secure. Similarly, in the early 80s, another set of protocols like rlogin, rsh, rcp were released but were never secure. Automation needed a method that allowed a secure connection to the server and environment so that a user could access different services from external systems.

During the 90s, SSH protocol was implemented, which enabled secure connections on multiple platforms, especially the Unix-based systems, followed by network devices. Similarly, Windows also released Remote Command Services with the NT servers, followed by WMIC and PowerShell in the later releases for enabling access to COM and WMI objects remotely. With the advent of better remote management, languages like PowerShell, Python, and Perl became powerful for system administration.

Many applications these days publish their functions via web services and APIs, which help in making interactions outside the server boundaries. Automation has matured with time, and its implementation has taken various shapes and sizes to fit different requirements.

3. Types of Automation

1 Script Automation (Task Automation)	**2** Runbook Automation (RBA)	**3** Playbook Automation
4 Workflow Automation	**5** Robotic Process Automation (RPA)	

1 Script Automation
(Task Automation)

In this type of automation, system tasks are wrapped, consolidated, and handled inside a script, which leads to faster execution. This system has been one of the simplest and oldest ways of automation. For ad hoc automation, this process is an ideal pick because it requires minimum skillsets and efforts. Let's look at its pros and cons:

Pros

Faster to develop and deploy

Easy to learn and build

Fits well with native and central automation

Lesser dependency on multiple systems

Cons

Not useful for end-user self-service

Tasks or Processes which requires Manual intervention can't be performed

Difficult to manage and has lesser visibility

Some of the most popular languages are mentioned below for different technology areas:

Windows: Batch **|** VBScript **|** PowerShell	**Unix:** Shell **|** Perl **|** Python
Network: Expect **|** Python	**Database:** PL/SQL **|** Perl **|** Python

2 Runbook Automation
(RBA)

The term runbook is often confused with the script but, it is the next level in the automation hierarchy. RBA is a human-to-tool interface that easily translates expert operations knowledge into automated procedures. It involves task automation, which enables the execution from a common interface and guides users through these activities. It also provides event tracking, automated alerts & monitoring of task execution. Here are some of its pros and cons:

Pros	Cons
Easier to build complex task automation	Difficult to implement user inputs required at any stage
Tasks can follow a process	
Better visibility/ monitoring of task executions	

Some of the most popular RBA tools are mentioned below:

RunDeck	IBM Runbook Automation	Azure Automation – Runbook Management

3 Playbook Automation

Though this automation correlates with runbook automation, it has its distinct features and processes. Playbooks deal with overarching responses to issues or events which may incorporate multiple runbooks . Moreover, it has been observed that Playbooks are language enabled which helps to accelerate automation development.

Ansible is a classic example of a platform that can automate the entire application lifecycle offering a continuous delivery pipeline using playbooks. It comes with an administrator-oriented language YAML, which pushes the configurations to individual nodes.

There are similar terms to a playbook like a cookbook, where the chef tool implements a developer-oriented language called Ruby DSL, which is comparatively more complex. Both offer similar solutions but with different architectures.

Here are some of the strengths and drawbacks of playbook automation:

Pros

Enables rapid automation and deployment

Offers easy-to-write scripts and configurations

Cons

Limited track of dependencies during execution

Functionality limited to specific areas of infrastructure management

Complex to implement user inputs required at any stage

4 Workflow Automation

Workflow automation is the ability to orchestrate and integrate tools, people, and processes through workflow effectively. **It provides functionalities such as:**

1	Scheduling	2	Interactive user forms	3	Decision-making
4	Live execution tracking	5	Multiple platforms & language support	6	Reusability
7	Configuration management	8	Tool integration	9	Error- handling

With these features in hand, end-to-end processes can be automated and tracked simultaneously with little or no manual intervention.

Pros

Better control of processes

Reduced cycle time | Improved visibility

Reduce the need for manual decision-making and handling with business rules

Concurrent task execution

Cons

Skilled resources required

Significant implementation cost

Some of the most popular workflow automation tools are:

ServiceNow Orchestrator   Ayehu NG   Microsoft Scorch   BMC Atrium

5 Robotic Process Automation
(RPA)

Now that we have gone through the ITPA (IT Process Automation) types, let's look at RPA. This type of automation enables users to create bots by human digital actions. These bots can learn, mimic, and execute rule-based business processes. That's why RPA has been a gamechanger in automation. Before RPA, with ITPA platforms, front-end automation was a difficult task. In environments where custom/non-standard applications are available, RPA can automate the tasks much faster. Here are some pros and cons before you implement RPA.

Pros

Drastically reduces development time for GUI-based automation

Easy to learn and implement

Cons

RPA platforms are usually cost heavy

Only one bot can run on a machine at a time

The right automation strategy would be to have a mix of ITPA and **RPA** to run end-to-end business-oriented processes.

Here are some of the most popular RPA tools:

UIPath   Automation Anywhere   Blue Prism

With various automation tools, the IT industry is now at a good maturity level. It has been an enabler that has led to:

1 **Better utilization of workforce**   **2** **Reduced MTTR** (Mean Time-To-Resolve)

3 **Reduced Errors**   **4** **Cost Savings**

5 **Improved User Experience**   **6** **Compliance Benefits**

4. The Advent of Intelligent Automation

Artificial Intelligence (AI) is the need of the hour and almost every IT organization is adapting to it. Today, it is a part of several applications, right from online shopping to OTT platforms and self-driving cars.

"Artificial Intelligence (AI) refers to any human-like intelligence exhibited by a computer, robot, or other machines. AI enables computers and machines to mimic the perception, learning, problem-solving, and decision-making capabilities of the human mind."

"Intelligent Automation(IA) is the combination of AI/Machine Learning and process automation that is used to create smart business processes and workflows that think, learn, and adapt on their own."

AI has found its way in automation and redefined the boundaries. Now we can go beyond business rules or human decision making at every step. Artificial Intelligence(AI) has led to Intelligent Automation(IA), which creates business processes and workflows that can think, learn, and adapt on their own.

Some of the ITPA and RPA solutions are equipped with AI technologies to imitate human intelligence and reasoning, allowing the system to learn, predict and recommend what to do next.

Is IA aligned to emerging infrastructure technologies?

Bringing intelligent automation into the IT infrastructure has been a challenging task due to:

Non-uniform tools/ accelerators in different environments

Access to customer data

Customers migrating to emerging technologies

Now the question is whether IA will be feasible with all of the upcoming technology releases?

The answer is - yes. Most of the upcoming technologies in the market will enable service and data accessibility to external systems, which will make IA possible. In fact, the trend of customers migrating faster to cloud-based systems and applications is an encouraging sign for IA.

Artificial Intelligence for IT operations has already been able to overcome the shortcomings of a pre-AI era of automation. Critical areas like self-healing, proactive maintenance, data discovery are being addressed independently with AIOPS solutions.

An AIOps exchange survey states that 45% of businesses leverage AIOPS for better root cause analysis and helping to predict potential problems.

5. How IA is redefining the industry?

IA has changed the expectations of all customers. The service providers now tend to incorporate AI in their solutions to compete in the industry. Here are some examples where IA has proved to be beneficial:

1

IT help desk automation

Manual catch and dispatch have always been an overhead. In that model, operators receive and assign alerts to domain experts via their legacy event-management dashboards. On the other hand, IA solutions have reduced **desk tickets** by **60%**, along with a **33% reduction** in MTTR (mean time to restore).

2

Online enquiries

Many client advisors realized that a significant part of their work involved answering simple and repetitive questions. The questions were raised through emails or assistants. By bringing in IA solutions with virtual assistants, **50%** of the **350,000 daily emails** were **answered automatically**. It also helped advisors to find the right answers quickly for the rest 50%.

Moreover, it has improved quality and accuracy in functions like proactive application maintenance, invoice processing, fraud detection, etc.

6. Future of IA?

Most organizations today find that IA can give them qualitative and quantitative benefits. That is one prime reason why so many organizations encourage the idea of IA.

According to Gartner, 59% of organizations are in the knowledge-gathering/ investigating/ developing strategy phase of their AI journey.

IA will step in for end-to-end processes gradually over the period. In the next 15 years, we should be able to see traditional automation completely replaced by IA. This method will also make employee satisfaction higher as they can focus on continuous process improvement and innovative solutions.

Conclusion

IA, hyper-automation or cognitive automation is already taking over the IT operations. The journey from traditional automation to IA has come a long way. Companies are looking for improved productivity, reduced errors, lower-cost scalability, and an improved customer experience with IA. A complete IA solution would combine four branches ITPA, RPA, artificial intelligence, and integration. It would be great to watch and contribute towards this shift to IA.

Authors

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Sharad has 8.5 years of experience in the field of Infrastructure Automation with specialization in Automation Solution Design, Process Consultation, Tool Integrations, Reusable Development & Intelligent Automations. He has worked in multiple industry domains from telecom, finance and networking to automate infra and application support. He is part of Automation COEs and helped to build relevant point solutions. He is technical lead for Automation Factory team which provides reusable automation solutions to different practice units.