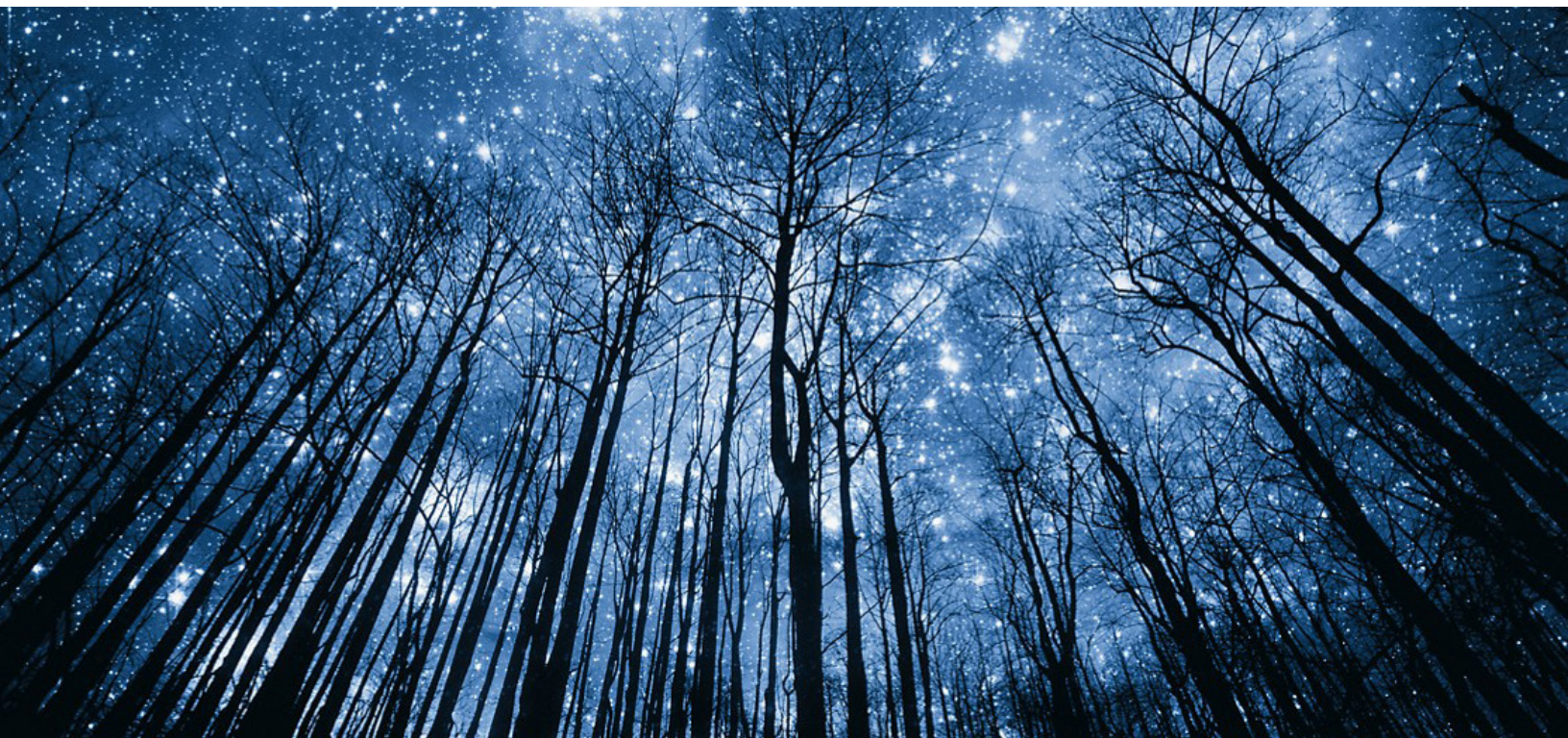


# INTELLIGENT PROCESS AUTOMATION – AN AI MARVEL



**Prateek Bhat**

Inside Product Specialist  
Dell Technologies



The Dell Technologies Proven Professional Certification program validates a wide range of skills and competencies across Dell's multiple technologies and products with both skill and outcome-based certifications.

Proven Professional exams cover concepts and principles which enable professionals working in or looking to begin a career in IT. With training and certifications aligned to the rapidly changing IT landscape, learners can take full advantage of the essential skills and knowledge required to drive better business performance and foster more productive teams.

Proven Professional certifications include skills and solutions such as:

- Data Protection
- Converged and Hyperconverged Infrastructure
- Cloud and Elastic Cloud
- Networking
- Security
- Servers
- Storage
- ...and so much more.

Courses are offered to meet different learning styles and schedules, including self-paced On Demand, remote-based Virtual Instructor-Led and in-person Classrooms.

Whether you are an experienced IT professional or just getting started, Dell Technologies Proven Professional certifications are designed to clearly signal proficiency to colleagues and employers.

# TABLE OF CONTENTS

TABLE OF CONTENTS..... 3

ABSTRACT..... 4

Importance of Automation..... 4

Introduction to Intelligent Process Automation ..... 6

Process and components of IPA ..... 8

IPA vs RPA ..... 9

Benefits of Intelligent Process Automation ..... 9

Challenges in Intelligent process automation ..... 10

Application and Uses of Intelligent process automation ..... 10

CONCLUSION..... 13

REFERENCES ..... 13

## ABSTRACT

Usage of AI and analytics is now a new norm in organizations that want to survive huge competition in the IT industry. New tools are developed, and new algorithms are designed that empower the business firms to utilize new age technologies like Artificial Intelligence (AI), process automation and intelligence, Machine learning and Natural Language Processing (NLP). Intelligent Process Automation (IPA) is one such technology that is widely used to automate the business processes end-to-end in an effective way.

IPA is the collection of various technologies that envision the Automation, Integration and Management of Digital Processes. Key technologies involved in IPA include Digital Process Automation (DPA), Robotic Process Automation (RPA) and Artificial Intelligence (AI).

Intelligent Process Automation could be defined as the combination of multiple intelligent technologies to modify comprehensive end-to-end business processes. It associates degree evolution from automating basic rule-based tasks to managing and automating entire business processes that embody multiple tasks. At its core, intelligent process automation is the convergence of RPA and various AI (AI) technologies to automate the larger decision-making business processes that have historically been required along with worker intervention and enforcement. The promise of intelligent process automation stems from the flexibility to require automation of a different level of complexity, creating greater efficiency, reduced operative costs, agility, and a far better experience all around.

This article will emphasize what Intelligent Process Automation (IPA) is. These topics will be covered in this article:

- Process of IPA
- Working of Intelligent process automation and its implementation
- Uses and applications of this technology in industrial applications
- Advantages and challenges of IPA
- Different technologies of IPA
- Conclusion about IPA and its uses

Overall, this article discusses how IPA introduces immense speed and efficiency into the existing traditional systems when they are implemented, due to which labor-intensive tasks and various tedious computing activities are simplified. This in turn saves a huge amount of time for business firms. The decisions made by these systems are also highly intelligent and validated, because of the AI technologies involved.

## Importance of Automation

Technology is evolving. With the emerging workloads in the industry, it is now a common phenomenon that Artificial Intelligence (AI) will take over to make the systems more efficient and effective. The technology sector needs automation and AI because they boost production and efficiency, save costs, and enhance accuracy, promoting better decision-making.

Automating repetitious procedures and activities enables more effective resource usage and reduces human error. Artificial intelligence (AI) can evaluate vast volumes of data, make predictions, and make decisions based on them, improving the performance in domains like customer service and supply chain management. AI and automation may also facilitate the creation of novel goods and services as well as business models. In general, the usage of automation and AI can result in more innovation and competition in the technology sector.

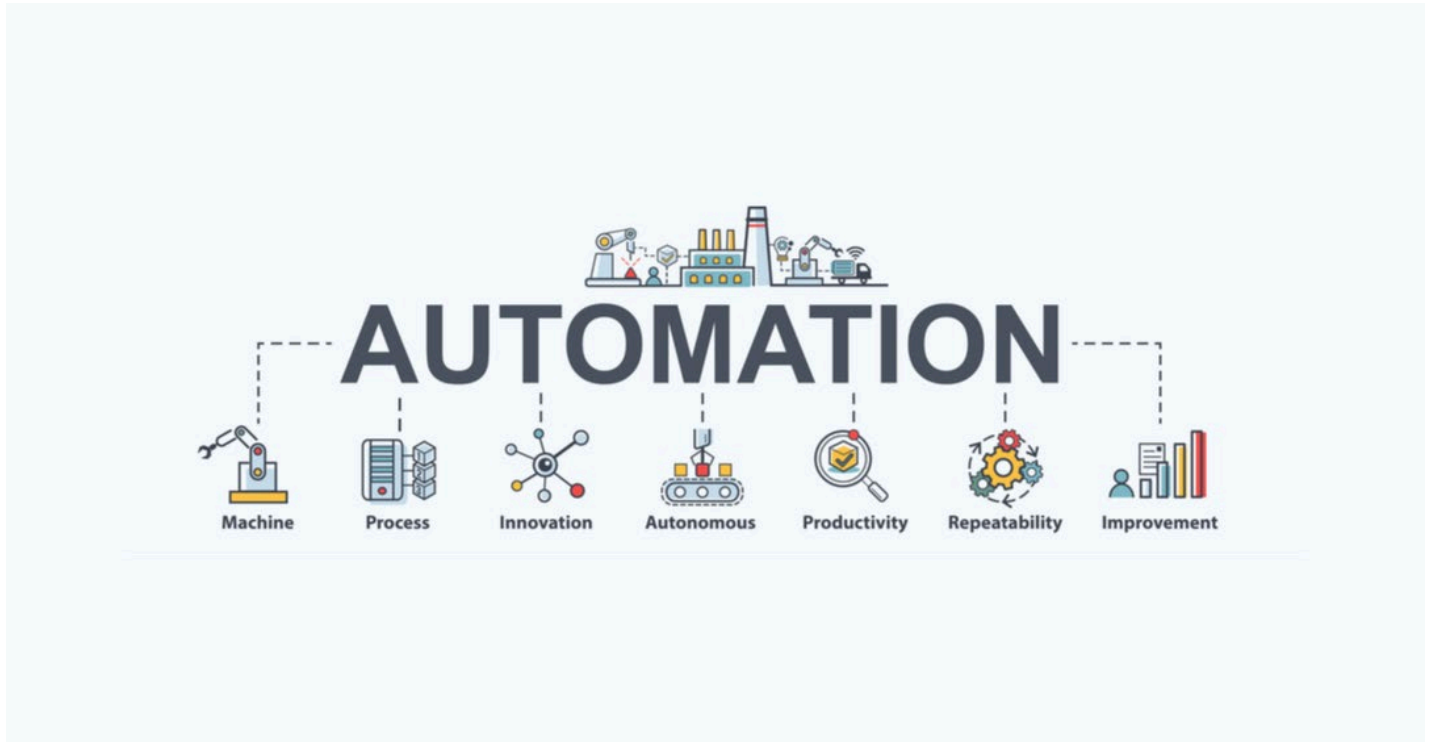


Fig 1: Various sectors that benefit from automating processes  
 Source: <https://magnetarit.co.uk/5-ways-your-business-benefits-from-automation/>

Automation can help organizations in a variety of ways, including:

1. **Increased efficiency:** Automating repetitive, monotonous, cumbersome tasks and processes can help organizations focus more on value-added activities that help them innovate and grow the business. This will increase the overall productivity, decrease the labour costs, and bring more value to the business.
2. **Improved accuracy:** Automation has the capability of reducing human error, leading to improved accuracy in tasks such as data entry and record keeping. This will help organizations be more accurate in the data that they generate so that the business values derived out of the data will be more accurate as well.
3. **Cost savings:** Numerous labour expenses, as well as costs related to margin of error and rework, can be decreased with automation. Further cost reductions may result from a reduction in the requirement for manual intervention and supervision.
4. **Increased scalability:** Business stability will be enhanced using Automation because it can empower organizations to handle increased workloads without the need to add additional staff. So, as the manpower and margin of human error decreases, related costs and uncertainty also decreases. This will increase the stability.
5. **Improved customer service:** Automation may be deployed in a way that helps the company provide better customer care. For instance, by using a chatbot or AI-developed chat machine application, common consumer clarifications might have automated replies. Additionally, businesses may utilise AI

to analyse client data and offer tailored recommendations to boost sales and enhance customer service in general.

6. **Better decision making:** With its sophisticated neural network technology and learnings, artificial intelligence (AI) aids enterprises in improving their decision-making. Automation of data collecting and processing may provide organisations with more reliable data and real-time insights to help them make better decisions.
7. **Flexibility:** Automation can be used to perform a wide range of tasks that can be easily scaled up or down to meet the needs of the organization.

In general, automation may help businesses become more successful, precise, and cost-effective while also enhancing their ability to provide customer care and make decisions.

Some of the important AI techniques that are used for Automation are:

- Digital Process Automation (DPA)
- Robotic Process Automation (RPA)
- Intelligent Process Automation (IPA)
- Artificial Intelligence and Machine Learning (AI/ML)

Now that we've seen how Automation works and how it will be providing enhanced value to the business, let's see what Intelligent Process Automation (IPA) deals with.

## Introduction to Intelligent Process Automation

Intelligent Process Automation (IPA), one of the most rigorously expanding disciplines, uses standard automation techniques along with artificial intelligence (AI) and machine learning (ML) to optimise business processes and increase productivity. It is a branch of the larger area of robotic process automation (RPA) and is rapidly gaining popularity in the commercial and technical sectors.

IPA is used to automate processes that are repetitive and rule-based that are traditionally done by people. This covers duties including data input, billing, and customer support. Without the need for human interaction, IPA can learn from the data it processes and make judgements by utilizing AI and ML. This makes it possible to do more complicated activities and analyse data in a faster, more accurate manner.

Intelligent Process Automation is a subset of a comprehensive framework of a technological trend known as automation. Automation is enabling and utilising new types of intelligence to bring a space-age technology into the present, such as driverless automobiles and autonomous drones. Automation is changing how we live and work, whether it is through the automated processes of a business or customer communications in the form of desktop assistants.

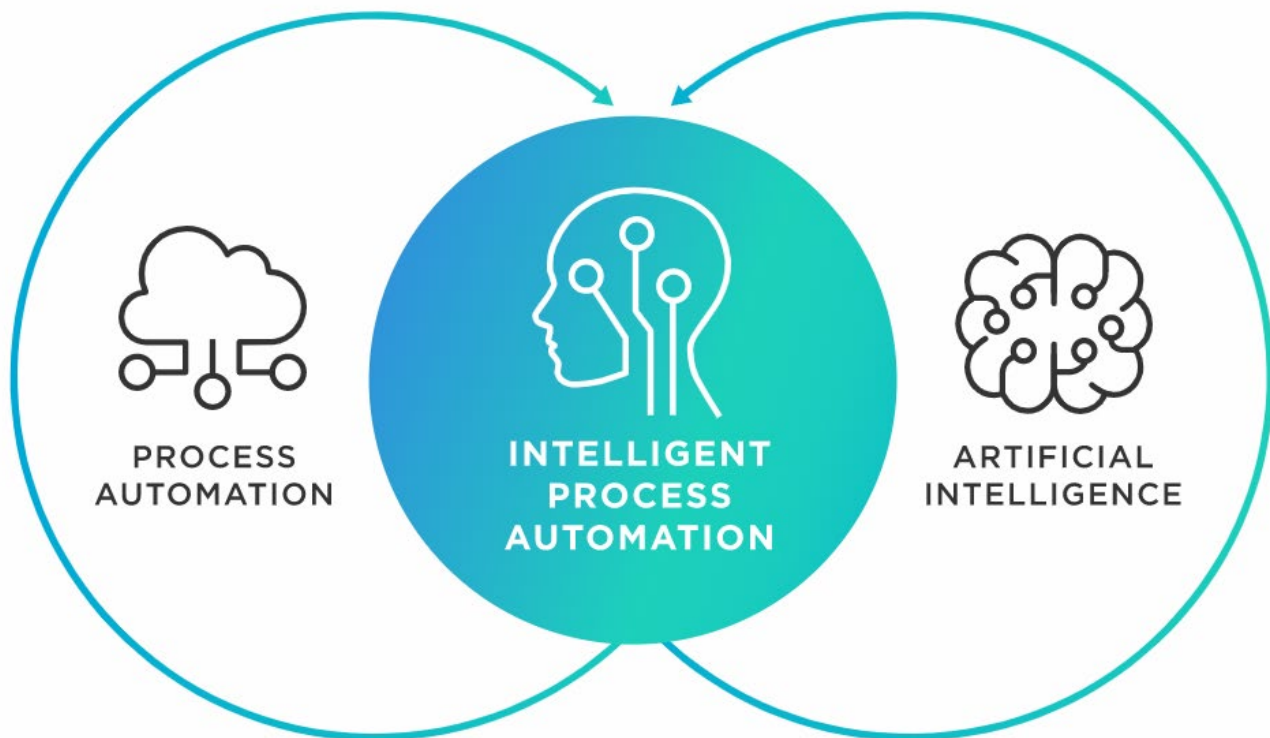


Fig 2: What is Intelligent Process Automation?

Source: <https://www.tibco.com/reference-center/what-is-intelligent-process-automation>

So, what exactly does IPA comprise of? How does it work?

The application of technology to automate or optimise processes using machine learning and artificial intelligence is known as Intelligent Process Automation. IPA solutions can automate business processes while reducing human participation with artificial intelligence (AI).

This covers cognitive automation, robotic process automation, and machine learning powered by artificial intelligence. Business operations are being transformed by this game-changing technology. IPA is able to automate routine, rule-based processes and boost overall productivity by fusing the strength of artificial intelligence and machine learning with conventional automation techniques. Consequently, businesses can concentrate on their core skills and delegate the time-consuming, repetitive activities to robots.

We all know that IPA mimics humans. As time goes on, IPA notices human actions and becomes progressively more adept at imitating them using various AI technologies. Thanks to advancements in deep learning and cognitive technologies, traditional rule-based automation tools are now equipped with decision-making capabilities. The benefits of IPA include drastically improved efficiency, elevated worker performance, less operational risks, quicker reaction times, and better customer journeys.

IPA solutions go beyond a simple collection of guidelines. A technological stack makes it possible to monitor, automate, and integrate digital operations. The three key technologies that comprise IPA are digital process automation (DPA), robotic process automation (RPA), and artificial intelligence.

## Process and components of IPA

IPA is not an easy process. It is the mixture of digital process automation (DPA), robotic process automation (RPA), and artificial intelligence all combined together. So, there are lot of processes and computing that takes place when IPA is to be implemented.

## Intelligent Process Automation Framework

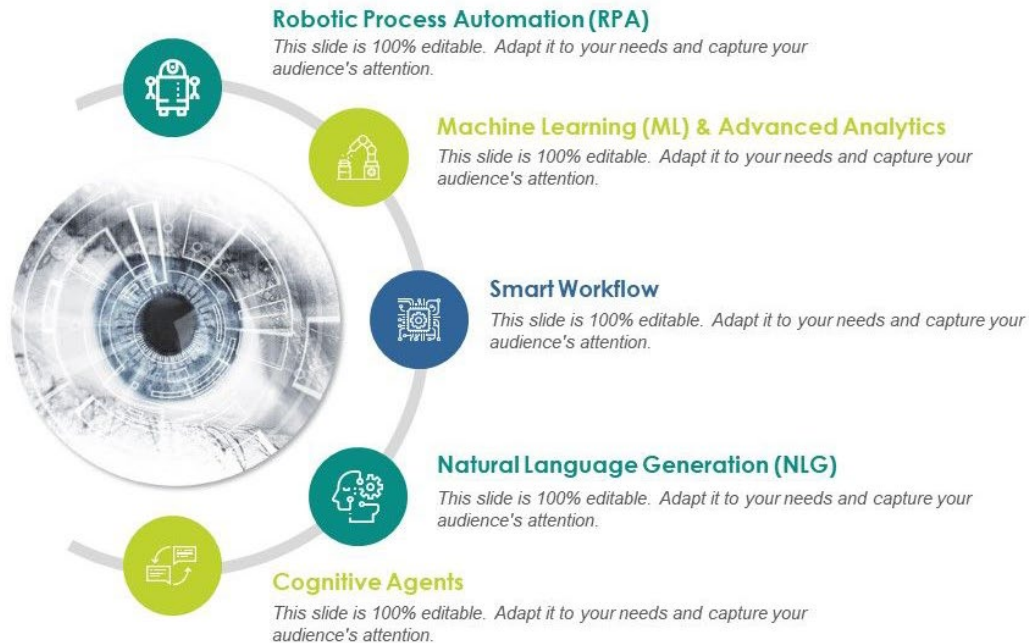


Fig 3: Components and Process of IPA

Source: <http://www.differencebetween.net/technology/difference-between-rpa-and-ipa/>

Some of the components of IPA contain:

- Server-bots that are unattended robots in manner, which comprehensively automate various tasks that might not need human intelligence, judgment, and involvement.
- Machine Learning algorithms that specifically recognize patterns in various structured intended data using "supervised" and "unsupervised" learning.
- Intelligent workflow solutions that facilitate the coordination, management, and handoff of processes involving both machines and people.
- Cognitive agents are virtual beings that use a combination of machine learning and natural language processing to execute tasks, learn from data sets, and interact with people.
- Optical Character Recognition, for instance, uses computer vision to extract text from a scanned image or document.
- A computer can interpret and alter spoken and written language with the help of natural language processing (NLP) software. Chatbots and Virtual assistants depend on this technology.

IPA solutions go beyond straightforward, rule-based operations. As an instance, IPA solutions can use artificial



intelligence to handle unstructured data, which many RPA tools are unable to accomplish, or supply IT resources to guarantee that crucial SLAs are maintained. Another illustration would be the employment of machine learning techniques to enhance task performance over time for the IPA tool.

## IPA vs RPA


RPA	IPA
RPA stands for Robotic Process Automation.	IPA stands for Intelligent Process Automation.
RPA is a software-based robot (or bot) that is capable of automating human actions or behavior in the workplace.	IPA is the combination of RPA and AI technologies to handle more complex processes rather than just automating routine tasks.
Helps automate high volume processes for which people were formerly responsible.	RPA brings a measure of decision making to the process to meet challenging demands.
RPA evolved from three primary technologies: screen scrapping, workflow automation, and Artificial Intelligence (AI).	IPA brings innovative, new technologies to RPA, such as Natural Language Processing (NLP), Machine Learning, Data Extraction, and AI.
	

Fig 4: Difference Between RPA and IPA

Source: <http://www.differencebetween.net/technology/difference-between-rpa-and-ipa/>

Robotic process automation (RPA) is frequently mistaken with Intelligent Process Automation. Some people also say that RPA is nothing but IPA. Well, that is just partially true. Although IPA solutions frequently incorporate robotic process automation as a core feature, IPA does not always have to include RPA.

Robotic process automation (RPA) is the practise of automating routine, rule-based operations using software, platforms, or scripts. When performed manually, these procedures frequently take a long time. For instance, an RPA tool may be trained to automate the process rather than manually gathering phone numbers from apps. Because RPA technologies are rule-based, they have the drawback of being inflexible. The RPA tool won't be able to finish the assignment if the business changes its form or a client inserts data into the wrong row.

## Benefits of Intelligent Process Automation

Implementing IPA, has many benefits on the Organizational strategy and business. Some of the benefits are mentioned below:

- Empowers organizations and allow them to focus on their core competencies and leave the repetitive, time-consuming tasks to the machines.
- Frees up human resources to concentrate on more strategic and value-adding tasks, including making decisions and addressing problems.
- Lowers the chance of human error, which can result in expensive errors and delays.
- IPA can learn from the data it analyses and make judgements without human involvement. This enables quicker and more accurate data processing.
- Continuous work without interruption and ability to manage a large number of duties without taking time off. This enables businesses to lower labour expenses while increasing production.
- IPA may also be coupled with other programmes and systems, including CRM and ERP applications, enabling smooth data flow and better decision-making.

IPA may provide adequate regulatory compliance by automation of operations and processes at various levels with adherence to all standards and no variance from one employee to the next. Also, it may enable businesses to get a bird's-eye view of the company's operations, revealing problem areas as well as workflow and process problems. It can be used to identify crucial turning points in the purchasing process and highlight opportunities to enhance the shopping experience and raise customer happiness. This retains customers and reduces turnover. Business operations are being transformed by this game-changing technology. Traditional automation technologies may be combined with the strength of artificial intelligence (AI) and machine learning (ML) to create IPA, which can automate routine, rule-based operations, and boost productivity. Consequently, businesses can concentrate on their core skills and delegate the time-consuming, repetitive activities to robots.

## Challenges in Intelligent process automation

Some challenges of IPA include:

- A need for a substantial investment in infrastructure and technology. Since IPA systems are still quite new and specialised, it is important to locate the proper people to deploy and maintain them.
- Taking careful preparation and execution of the technology is not a one-size-fits-all approach.
- Businesses must decide which procedures to automate and check that the technology is appropriately incorporated into their current systems.
- In order to make sure that the IPA systems are being utilised efficiently and morally, it is crucial to have good governance and monitoring in place.

## Application and Uses of Intelligent process automation

Intelligent Process Automation may be built atop existing data systems and digital setups; thus, it doesn't require a significant financial commitment to implement. For instance, there are cases where-in the robotic process automation component was put into place very quickly—in some cases, at a period of even less than a month — so that it is now providing great value to the business and its customers. Organizations need to stay away from the pitfall of siloed IPA implementation. Results from a comprehensive approach are significantly better. To determine the areas most likely to experience growth and value through intelligent process automation, all business processes must be thoroughly evaluated. The design must then be mapped out in accordance with these findings.

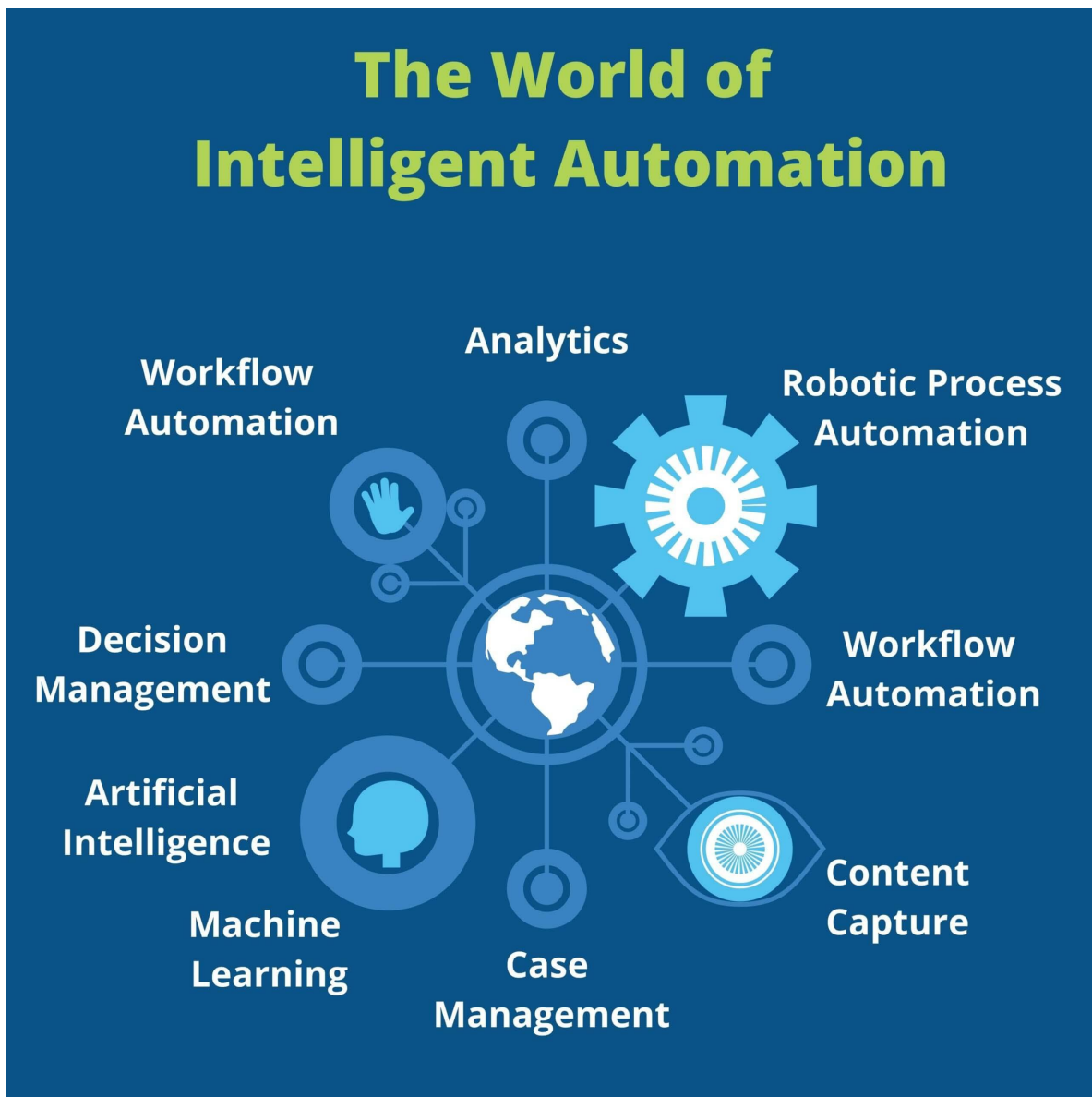
Any newly implemented intelligent process must have a broad awareness of the company's operations, business strategy, and goals to be effective. In other words, the operational model's goals for the process must

be very well specified. More significantly, it must be aware of and cleverly integrated with the system's current capabilities.

Customer service is a significant area where IPA is being employed. Customer queries, problem-solving, and even basic transactions may all be handled via IPA systems. This lowers labour expenses while enabling businesses to offer more effective and efficient customer service.

The usage of IPA in accounting and finance is another instance. Automation of processes like data input and billing using IPA systems may minimise mistakes and increase productivity. Furthermore, IPA may be used to analyse financial data and spot patterns and trends that might aid businesses in making better decisions.

Additionally, HR and recruitment can use IPA. The time and resources needed for operations like screening resumes and arranging interviews may be decreased by using IPA systems to automate these processes. Additionally, IPA may be used to review resumes and find the best prospects, which can assist businesses in making better recruiting decisions.



## Fig 5: Application and Use-Cases of IPA

Source: <https://pyramidsolutions.com/enterprise-content-management/blog-ecm/what-is-intelligent-automation/>

Organizations may be able to increase productivity, save operating expenses, and provide better client experiences thanks to Intelligent Process Automation. It may be used to a range of sectors, including industry and banking. Here are some additional IPA usage cases:

1. **Data gathering:** An IPA tool may collect consumer data from many platforms in place of customer care representatives. Data from the database may be gathered, and records can be updated with data from calls and emails.
2. **Insurance:** Many hours are spent inputting data from claims forms into CRMs by some claims departments in insurance companies. The critical information may be extracted from the forms using IPA software and then entered into the CRM.
3. **Shipping:** An IPA tool may be used to analyse shipping data and optimise shipping schedules and routes to avoid delays, making the most of resources, and lessening bottlenecks.

It is quite intriguing how robotic process automation, artificial intelligence, and digital process automation collaborate to provide superior customer/end-user experiences. An "event data pipeline" is where automated processes get data inputs from a variety of sources and interfaces, such as chat or voice bots, payment gateways, microservices, sensory tools, and analytic reports.

Here are some excellent instances of Intelligent Process Automation in a variety of fields, such as marketing, sales, and customer service in the retail industry.

- Retail and e-commerce websites use chatbots and other virtual helpers to answer frequently asked inquiries, facilitate transactions, and assist customers after a purchase. Well-designed chatbots provide tailored suggestions, quick delivery, and simple returns. Customers may use these product recommendations made by the algorithms powering the chatbots in an increasing number of cases. These chatbots employ AI to generate suggestions that boost revenue in addition to relieving staff members of handling customer inquiries.
- The Internet of Things is significantly changing experience retail. Smart mirrors track your physical characteristics and allow users to view how different outfits and cosmetics will look on them. The retail sector will increasingly witness this well-liked use of automation and artificial intelligence.
- Voice recognition technology allows pharmacies to verify consumers more quickly and securely.
- Data on consumer patterns may be obtained from self-checkout lanes and points of sale, which can be applied to more economically stock shelves.
- Brands may use current product reviews to propose products to potential customers.
- The Mayo Clinic in Florida deployed driverless, autonomous smart cars to transport patient samples and provide medical supplies during the COVID-19 epidemic.
- Various latest technologies like ChatGPT, OpenAI etc. also use these kind of IPA

## CONCLUSION

We have observed how automation aids in the industrial revolution. Technologies are quickly developing. Artificial intelligence (AI) will likely take over as a result of the increasing workloads in the sector in order to improve system effectiveness and efficiency. Automation and AI are necessary for the technology industry because they may increase output and efficiency, reduce costs, and improve accuracy and decision-making.

Utilizing AI and analytics is becoming the standard for businesses that want to remain competitive in the fierce IT market. The creation of new tools and algorithms enables businesses to use innovative technology like Artificial Intelligence (AI), process automation, machine learning, and Natural Language Processing (NLP). Intelligent Process Automation (IPA) is frequently used to efficiently automate corporate operations from beginning to end. IPA is a grouping of several technologies that aim to manage, integrate, and automate digital processes.

The different key technologies involved in IPA include Digital Process Automation (DPA), Robotic Process Automation (RPA) and Artificial Intelligence (AI). We discussed how IPA works and looked at some of the tools and components of the IPA. We saw how IPA uses technologies such as artificial intelligence (AI) and machine learning to automate repetitive and manual tasks. Some of them include Improving efficiency and productivity, increasing accuracy and reduce errors, reduce costs, improve customer experience, enable scalability, provide insights by analyzing the data and many more. This helps the organizations to develop a comprehensive business and efficiently manage work and costs.

Overall, we can conclude that Intelligent process automation (IPA) is a technology that automates manual and repetitive operations by utilizing artificial intelligence (AI) and machine learning. Businesses may benefit from higher productivity, accuracy, decreased mistakes, cost savings, better client experiences, scalability, and insights, among other things. IPA may be used to a variety of processes and sectors, including manufacturing, retail, healthcare, and finance. It is a significant piece of technology that may aid organizations in streamlining operations and enhancing overall performance, and it is essential to Industry 4.0 and digital transformation.

## REFERENCES

1. An Introduction to Intelligent Process Automation (IPA) “Ashesh Anand” – Sep 23, 2021 - <https://www.analyticssteps.com/blogs/introduction-intelligent-process-automation-ipa>
2. What is Intelligent Process Automation? - <https://www.tibco.com/reference-center/what-is-intelligent-process-automation>
3. Intelligent Process Automation - Automation enabled by context-aware robots - <https://www.uipath.com/rpa/intelligent-process-automation>
4. Intelligent process automation: The engine at the core of the next-generation operating model - By Federico Berruti, Graeme Nixon, Giambattista Taglioni, and Rob Whiteman - March 14, 2017- <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/intelligent-process-automation-the-engine-at-the-core-of-the-next-generation-operating-model>

5. What Is Intelligent Process Automation And Why Does It Matter? - Written by Brian McHugh - November 08, 2022: <https://www.advsyscon.com/blog/what-is-intelligent-process-automation/>
6. What is Intelligent Process Automation (IPA)? - By Gustavo Gomez, CEO 01/02/20 - <https://www.bizagi.com/en/blog/intelligent-process-automation/what-is-intelligent-process-automation-ipa>
7. Combine the power of RPA and AI to empower rapid end-to-end business process automation – Automation Anywhere - <https://www.automationanywhere.com/rpa/intelligent-automation>
8. What is Intelligent Process Automation? Its Purpose, Benefits, and Examples – Kissflow - 18.July.2022 - <https://kissflow.com/workflow/bpm/intelligent-process-automation/>
9. IPA for Document Intake & Understanding - <https://indicodata.ai/intelligent-process-automation/>
10. Top 25 Use Cases / Examples of Intelligent Automation in 2023 - Cem Dilmegani - PUBLISHED ON JUNE 30, 2022 - <https://research.aimultiple.com/intelligent-automation-examples/>
11. Difference Between RPA and IPA - <http://www.differencebetween.net/technology/difference-between-rpa-and-ipa/>

Dell Technologies believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

Disclaimer: The views, processes or methodologies published in this article are those of the authors. They do not necessarily reflect Dell Technologies' views, processes, or methodologies.

THE INFORMATION IN THIS PUBLICATION IS PROVIDED "AS IS." DELL TECHNOLOGIES MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO THE INFORMATION IN THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Use, copying and distribution of any Dell Technologies software described in this publication requires an applicable software license.

Copyright © 2023 Dell Inc. or its subsidiaries. All Rights Reserved. Dell Technologies, Dell, EMC, Dell EMC and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.