

Process Automation 2.0 with Generative AI Framework

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Abstract: *This article introduces an innovative approach, referred to as Intelligent Process Automation 2.0, that leverages a Generative AI Framework to revolutionize organizations. By combining advanced machine learning algorithms with domain - specific expertise, Intelligent Process Automation 2.0 promises to deliver unprecedented levels of efficiency, accuracy, and scalability. Our scientific method entails creating a generative AI model that can comprehend and mimic human intelligence when tackling complex tasks. The AI model can evaluate immense amounts of data, generate important insights, and produce excellent results on its own by replicating human cognitive processes. The key findings of our qualitative analysis highlight the notable gains made possible by Intelligent Process Automation 2.0. First off, the platform allows for the seamless fusion of various data sources, transcription tools, and analytic methodologies, expediting the business processes in organizations. Second, the framework's capacity to produce well - organized and contextually appropriate content demonstrates its ability to automate crucial processes like abstract summarization, plagiarism detection, and language editing. These findings have positive repercussions for enterprises and its customers. The potential to speed up and streamline the procedures for scholarly publications, lessen human error, and improve overall quality exists with Intelligent Process Automation 2.0 with Generative AI Framework. Additionally, by using this framework, academics and researchers can focus on more imaginative and analytical components of their job, freeing up crucial time for them to do so. In conclusion, our research illuminates Intelligent Process Automation 2.0's disruptive potential and offers a viable direction for further study and application in the area.*

Keywords: Intelligent process automation framework, generative Artificial Intelligence (AI), use cases of Generative AI, Processes automation using Generative AI, Next Gen automation framework

1. Introduction

In today's fast - paced world, the need for efficient and streamlined operations has never been greater. With Intelligent Process Automation 2.0, Artificial Intelligence (AI), which has recently emerged, is revolutionizing the industries across the globe. The advantages, structure, and possibilities of this cutting - edge strategy, which blends advanced machine learning algorithms with domain knowledge, are explored in this article.

Intelligent Process Automation (IPA) [2] blends Robotic Process Automation (RPA) and Artificial Intelligence (AI) to enhance business operations. While RPA automates repetitive tasks by mimicking human actions, AI introduces human - like intelligence. This "intelligence" enables systems to read text through Optical Character Recognition (OCR), recognize images with classifiers, convert text to audio and vice versa, and analyze patterns using machine learning. Although machines are becoming smarter, human in loop remain crucial for managing exceptions. The aim of IPA is to increase efficiency, aiming for more touchless transactions and seamless processes. This will result in improved business operations and customer satisfactions for enterprise customers.

The purpose of this article is to elaborate existing Intelligent Process Automation and show what and where new solutions are added by generative AI. How enterprises can integrate same in their business operations. Additionally, below sections will delve into examples, tech stacks and use cases.

2. Intelligent Automation Framework

Intelligent Process Automation 2.0's framework is based on a Generative AI model that emulates human intellect. This model performs extensive data analysis, derives insightful knowledge, and produces excellent results on its own. [14]

The AI model can comprehend complex textual material, spot important trends, and efficiently summarize findings thanks to Natural Language Processing (NLP) approaches. It makes use of sophisticated algorithms to spot plagiarism, speed up language editing, and summarize abstracts. Researchers and academics can now focus on more creative and analytical aspects of their work while the system takes care of tedious and time - consuming activities thanks to the generative capabilities of AI inside this framework. [3]

AI used to be a concept with several main application areas. Some of such fields included robotics, computer vision, automatic theorem proving, natural language processing, automatic programming, intelligent data retrieval, etc. These application areas are now so diverse that each may be regarded as a separate field. Today, AI is best understood as a collection of fundamental concepts that support many of these applications. The fundamental idea behind smart factories and industry is the use of AI by robots to fulfil complex jobs, lower prices, and increase the quality of products and services. With the aid of cyber - physical systems, AI technologies are penetrating the manufacturing sector and fusing the real and virtual worlds. By utilizing AI, the manufacturing sector becomes smarter and more equipped to handle contemporary issues like configurable specifications, shortened time to market, and an increase in

the number of sensors utilized in equipment. AI and adaptable robot technology make it simpler to manufacture a variety of goods. Large volumes of real - time data collected

from multiple sensors can be analyzed using AI techniques (like data mining). [5]. There are four important layers – Input, IPA Layer, Human in Loop, and Output

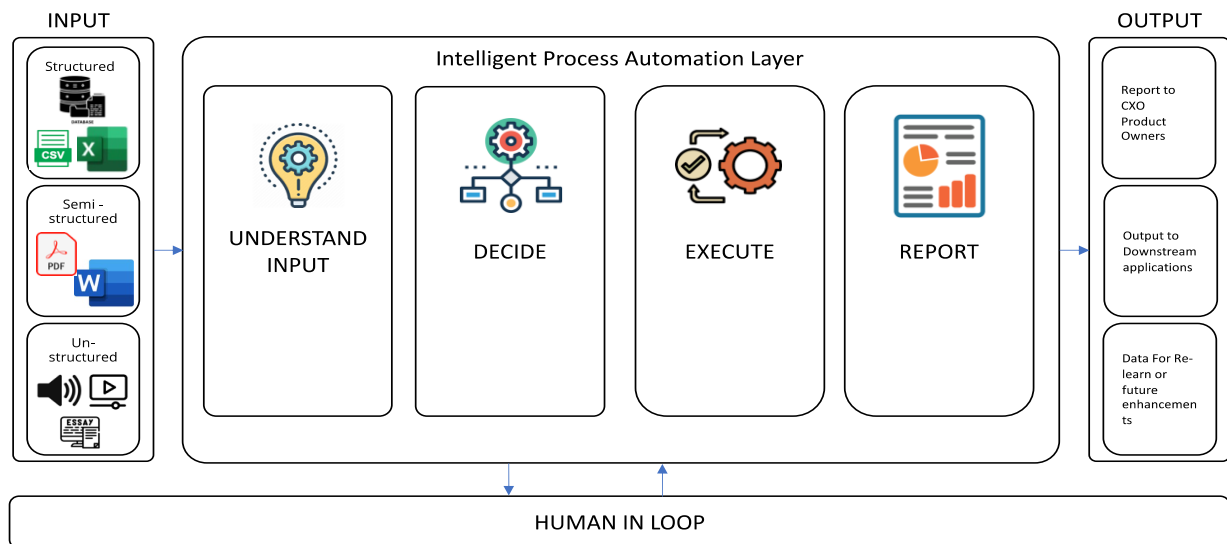


Figure 1: Intelligent Process Automation Framework

2.1 Input

- **Structured:** Traditionally system interacted via input to applications using structured inputs like agreed data in CSV's, TSV's, integrations using staging data and via API with structured locked in.
- **Semi - Structured:** While applications used to connect only structured format, enterprises use more modes of inputs like Invoices in form of PDFs from its vendors, for a bank to process loan needs Driving license or insurance copies with data coming in PDFs where the location of information is available at tentative location.
- **Unstructured:** Apart from data coming in text formats, customers and other enterprises interact using various other formats where no structure was followed, like voice mails, customers interacting via Twitter\contact us from, etc.

2.2 Intelligent Process Automation Layer

To process the various inputs of enterprises or applications and cross talk, the IPA layer plays a key role.4 Key stages in the IPA layer can be orchestrated via Business process management tools like Pega, Appian, etc.

- Understand input and apply appropriate technology to convert input into system readable format. For example, to read a document and understand what it will be used for – like if PDF converts it in text and comprehend what kind of document it is. Audio convert to text and get it ready for the next steps. At this stage OCR tools, audio - to - text, ML can be utilized.
- Decide based on input what kind of process\next steps needs to be taken on it like driving license for a loan application, voice note to create ticket, apart from Workflow tools Machine learning and artificial intelligence plays a key role here and get input ready for Next stage.
- Execute the action using automation tools like Robotic Process Automation, or other low code or script - based

automation to perform actual action. Famous propriety/traditional tools in this landscape are UiPath, Automation anywhere, blue prism and many more. As technology is expanding open - source solution are making big wave with Robocorp, Open RPA, task. Automation is leading the pack.

- Reporting the execution output is key for the system to track business transactions, fix system and business exceptions. [5]

2.3 Output

Post execution of the IPA layer, the output can be passed to downstream applications. This output can also be used to report metrics applicable to different stakeholders.

Example: For loan processing, the Operations team will be more interested in calculating # of loans processed per day and the average time to process an application. CXOs will be interested in knowing the trend and \$ value. The automation team will be focused on the Success rate of automation, accuracy of data, etc.

2.4 Human in the loop

As this is an automated system made to facilitate human actions, at every stage in a scenario of failures or exceptions or spot checks, human in the loop is utilized. [4]

3. Benefits of IPA

Intelligent Process Automation 2.0 offers a wide range of advantages that transform organizations. First off, it improves efficiency by drastically lowering manual labor. Data input, categorization, and indexing are tedious administrative chores that can be automated quickly and accurately. By reducing the possibility of human error and saving time, this also ensures accurate and reliable outcomes. Additionally, the Generative AI Framework

enables the seamless fusion of multiple data sources, transcription tools, and analytic methodologies. It facilitates content aggregation, enables real - time collaboration, and streamlines complex operations, which boosts productivity and quickens decision - making. [17]

The benefits of IPA go beyond task automation - mimic logic - based action to human - like capabilities - based automation.

- Automation of previously manual and repetitive tasks.
- Optimization of worker productivity by freeing them of routine tasks.
- Coordination of work between software systems and people.
- End - to - end visibility of processes and customer journeys.

- Improvement of customer experience.
- Reduction of processing errors.
- Decreasing operational costs and transaction processing time.
- Easier adaptation to changes in process.

4. Intelligent Process Automation 2.0 with Generative Ai Framework

While IPA framework is consistently delivering results for organizations and industries across the world, handling of semi - structured and unstructured data is always a challenge. Generative AI frameworks are changing the way IPA works, and its benefits is having transforming effects on IPA. Below is depiction of IPA 2.0 framework.

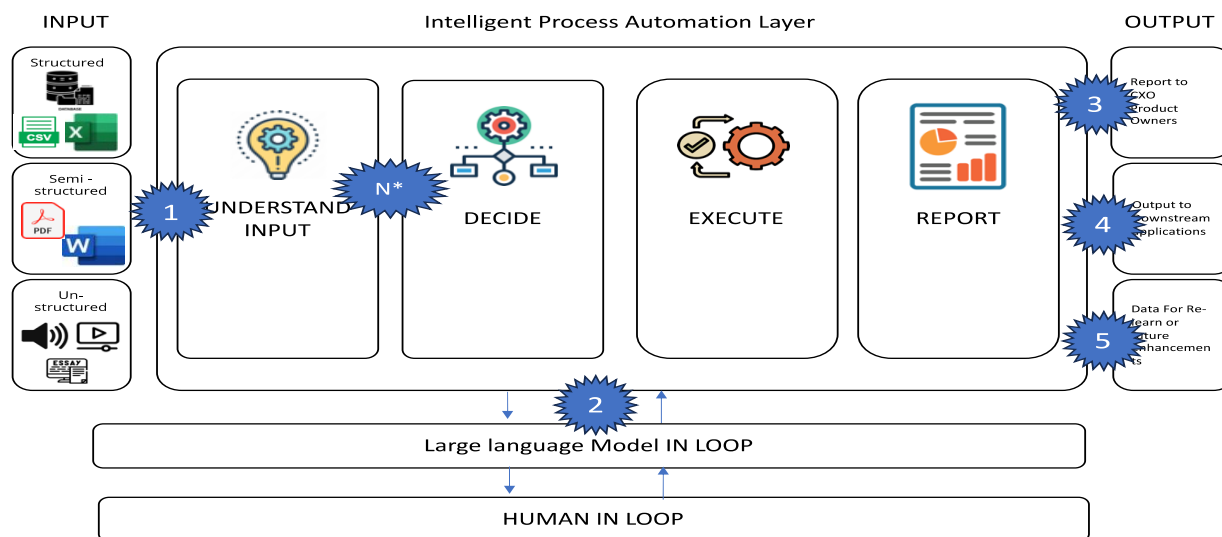



Figure 2: Intelligent Process Automation Framework 2.0

The blue box  are the touch points where Generative AI is making an impact and is changing the way IPA works. [6]

4.1 Input

While IPA framework 1.0 is capable of handling structured data and, to an extent semi - structured data, handling of unstructured data is always a challenge. Addressing the various input formats

- Semi - Structured – Image PDF: While the technology has evolved to read the image PDF, there are multiple services like AWS Textract, TensorFlow, Azure Text Analytics, etc., but finding the relevant information is always a task. For example, while reading the driver's license with date of birth and date of license expiry it needs to be marked and annotated in the document. With gen AI it can be read with query asking the information. [11]
- Semi - Structured – Word\text PDF: If the document is already in text format Generative AI can be used to ask specific information.
- Unstructured: Data from Voice\Video\Multiple article once converted to text format can be pushed to generative AI which can address questions needed for business process. Like adding generative AI on top of Alexa can take complex order and still make it API ready, understand the image. [18]

Sample prompts

- Find the Date of birth from the driver's license text attached in DD - MON - YYYY format.
- Find the Blood group type from the driver's license text attached.

4.2 Decide

The decide stage is where all the inputs are utilized to make decisions before executing the action. During decide stage, input, irrespective of source needs to be utilized to make decision like. Generative ai with customized models can help decision making easier.

Sample prompts (for Order to Cash process)

- Based on below statement find the intent between order creation and order update.
- Prepare a csv based on below sentence to find item name, quantity and request date.

4.3. Output

For each processing of transactions and automation, it needs to be sent to various stakeholders, requiring it in different format can be formatted and prepared using generative AI.

- CXO will require the value generated from the automation.
- Output for downstream application in excel formats.
- Output from IPA layer for enhancements/fixes etc. can be generated and shared with platform team.

Sample prompts (for Order to Cash process)

- Prepare a slide deck based on data from attached CSV sharing the # of orders created Value of Order.
- Prepare a csv to find most common error and solution if documented. Also, write a python code [8]

4.4. LLM and Human in Loop

In IPA 1.0 humans are used to handle all the exceptions negated at any stage and provide feedback. With gen AI\LLM, exceptions can be shared for processing and bringing decision making. If it cannot be handled, then only pass to human in loop.

By Adding generative AI in multiple stages of IPA, organizations are already seeing benefits. For example, in order to enhance human actions generative AI, like ChatGPT, can play a crucial role in enhancing IPA. ChatGPT can be integrated into the IPA framework to make processes more intelligent and efficient such as:

- Customer Support Chatbots: ChatGPT prompts can be used to train AI chatbots for handling customer inquiries, providing instant responses, and escalating issues to human agents when necessary.
- Data Entry and Document Automation: ChatGPT can be used to extract data from unstructured documents, invoices, or emails, and automate data entry into the company's systems.
- Process Documentation and Knowledge Management: ChatGPT can generate documentation and knowledge articles automatically based on input prompts. This can be used to keep process documentation up to date. [13]
- Benefits of incorporating ChatGPT into IPA includes improved accuracy, reduced operational costs, enhanced customer satisfaction, and the ability to handle repetitive tasks. [12]
- Artists now have access to new generations of algorithmic technologies. These technological intermediaries are paving the way for unexpected forms of creation based on the most recent advances in the field of machine learning, the theoretical underpinning of the current explosion in artificial intelligence applications. They also rely on access to unprecedented amounts of data and computational power. [16]

Example of ChatGPT:

User: "Can you explain the framework of Intelligent Process Automation 2.0?"

ChatGPT: "Certainly! The framework of Intelligent Process Automation 2.0 is built upon a Generative AI model. This model utilizes advanced machine learning and Natural Language Processing techniques to analyze large amounts of data. It can understand complex textual information, identify patterns, and generate high - quality outputs autonomously. With the Generative AI Framework, researchers and scholars can leverage AI - driven capabilities such as plagiarism detection, language editing, and abstract summarization, empowering them to produce high - quality content more efficiently. "

User: "Are there any limitations or concerns with Intelligent Process Automation 2.0?"

ChatGPT: "While Intelligent Process Automation 2.0 brings many advantages, it's important to consider potential limitations and concerns. Firstly, as with any AI system, the accuracy and quality of generated outputs are dependent on the training data and algorithmic design. Balancing automation with human oversight is crucial to maintain integrity and accuracy. Additionally, ethical considerations related to data privacy, bias, and responsible use of AI must be taken into account. Ongoing research and development are necessary to address these concerns and ensure the effective and responsible implementation of Intelligent Process Automation 2.0. "

The concept of artificial intelligence (AI) has been around for a while, recent advances have made it possible to achieve tangible business benefit, leading some experts to feel that the AI era has arrived. The fast rate at which innovation is being introduced is not slowing down, thus it is crucial for businesses to adopt these new innovations as soon as they become available in order to remain competitive and be market leaders. Additionally, it applies equally to all clients that use SAP as an enterprise solution. The "Intelligent Enterprise" was unveiled by SAP as the nascent market in SAP Sapphire 2018. Intelligent Enterprises efficiently leverage their data assets to accomplish their targeted business goals more quickly and at lower risk. According to SAP, organizations must invest in three crucial areas to become Intelligent Enterprises: an intelligent suite, intelligent technologies, and a digital platform. The "TCS Business 4.0" architecture from TCS is an addition to SAP's "Intelligent Enterprise" idea. [10]

The four main parts of "TCS Business 4.0" are Intelligent, Automated, Agile, and On - Cloud. TCS has developed "Intelligent Enterprise powered by Machine First Delivery Model (MFDMTM), " which is an integrated framework on SAP's Intelligence Enterprise, by extrapolating the TCS and SAP framework and applying enterprise transformation experience. In order to deliver the Next Gen Business & IT Experience, this framework places Artificial Intelligence (AI) at the center of the enterprise and makes use of cutting - edge technologies like Conversational AI, Intelligent Robotic Process Automation, Machine Learning, IoT & Blockchain, and Process Mining as part of an integrated architecture. With the help of this framework, company will expand while daily operations with IT will be completely hands - off. [9]

4.5 Benefits

As per Business Process Outsourcing Services in the US (Employment Statistics 2004–2029) [1], at present world's 665K population is working in outsourcing industry focused on repetitive and cumbersome task, with IPA gen 1.0 framework it was able to automate 15 - 25% depending on the industry. IPA 2.0 is early stages but is expected to bring this to 35 - 45% giving employees value to focused on value - driven activities impacting revenue generation for the companies.

- Higher percent of straight through processing with no human involved in loop
- Better turnaround time for business transactions
- Improvised SLA for business processes
- Compliance with Govt and regulatory SLA's [7]

5. Conclusion

We conclude by saying that Intelligent Process Automation 2.0 with Generative AI Framework has enormous potential to change organizations and the way they process business transactions. This strategy offers significant advantages, such as increased productivity, decreased error rates, and improved teamwork. Researchers and academics can spend more time on strategic projects, stimulating creativity, and quickening the speed of discovery by automating repetitive processes. The Generative AI model - driven framework of Intelligent Process Automation 2.0 enables seamless integration of data sources, enabling comprehensive analysis and the extraction of insightful knowledge. This expands research opportunities, raises the standard of academic publications, and strengthens the academic community as a whole. We must acknowledge Intelligent Process Automation 2.0's considerable influence on organizations like banking, healthcare, insurance, and supply chain sectors as we embrace it. It presents a rare chance to improve procedures, boost output, and open up new knowledge spheres. We open the door to a more productive and influential future for researchers, scholars, and the scholarly publishing sector as a whole by using the potential of automation and AI.

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