Intelligent Process Automation Umbrella -
The Most Advanced, Most Intelligent and Hyperconnected Systems

INTRODUCTION

The COVID19 Pandemic situation has given birth to the new normal where businesses and personal communities have learnt how to - flawlessly stay contactless when still in contact, work from home and still get all the work done in time, keep distance but still work together virtually and maintain the emotional quotient in the team and many more such experiences. As the second wave of this pandemic hits us across the world, it become even more important to run the business engine, meet the revenue targets and sustain this competitive market irrespective of the working conditions or available resources.   While businesses continue to struggle these unknown parameters set by natural calamities, the major struggle is to meet the constantly evolving customer expectations that can make or break a company's performance.

Therefore, to ride this high wave, enterprises must be well equipped to deliver services with quick turn-around, simplified delivery, simplified payment, simplified tracking and excellent customer support services. Global businesses have started leveraging the Most Advanced, Most Intelligent and Hyperconnected Systems to achieve such precision in seamless customer experience.

THE MOST ADVANCED, MOST INTELLIGENT AND HYPERCONNECTED SYSTEMS:

If you deeply ponder over these jargons, all look almost the same, with a futuristic objective to implement "Do-Think-Learn" concept. Where "Do" can convert speech into text, "Think" can understand user languages based on the communication, "Learn" business workflow and rules taught to them through structured training models.
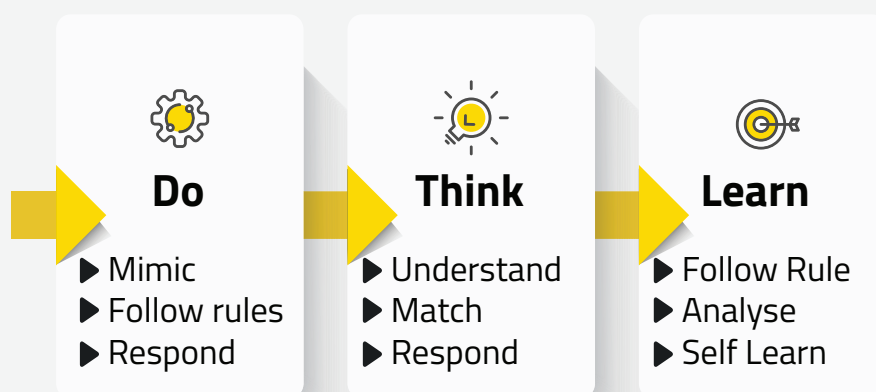
Do
▶ Mimic
▶ Follow rules
▶ Respond

Think
▶ Understand
▶ Match
▶ Respond

Learn
▶ Follow Rule
▶ Analyse
▶ Self Learn

Fig 1: The Most Intelligent Hyper-Connected Systems

Further, these three elements (Do-Think-Learn) evolved and transformed into a new framework mimicking human intelligence such as, Do, See, Talk, Think and Remember
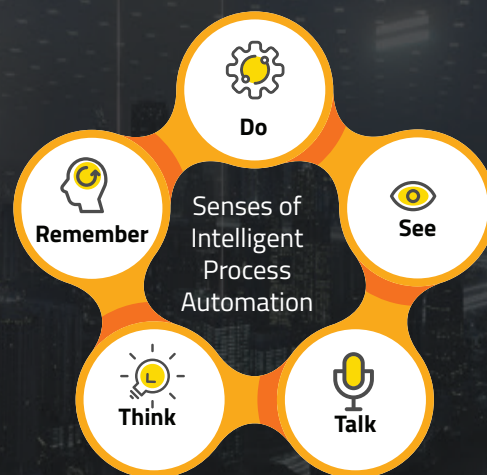

Fig 2: Five Senses of Intelligent Process Automation

Do – This sense used to mimic the human activities, which are repetitive and recurring, mostly data-based, and large in transaction volume. The technological tools, ideal for this, are RPA (Robotic Process Automation) and RDA (Robotic Desktop Automation), which are widely being used in business communities, to speed up their corporate functional activities such as Employee Timesheet processing, Payroll and Reimbursement processing, Supplier Invoices processing for payment disbursements and Customer Invoices Consolidation and Dispatching, which are large in volumes and also repetitive in nature.

See – This sense is typically used to monitor and record key business data elements to create knowledge repository for the organizations. CCTV and IoT sensors are the typical tools deployed in highly labor-intensive and where security and surveillance measures are mandatory.

Talk – This interactive sense is used to listen, understand, talk, or type and quickly respond to users for an intuitive customer interaction and experience. Currently, chatbots are widely used, in employee services help desks, internal IT support service desks, finance help desks, travel help desks, supplier service help desks and customer service help desks. Chatbots work, round the clock and hence can cater to the user queries anywhere and from any time zone.

Think – This sense is used to detect the underlying patterns and recognize the trends through intelligent algorithms to determine appropriate actions or predict future consequences. Machine Learning and Neural Networks are being used mostly in Telecom, BFSI and Healthcare Sectors, to resolve customer churning and sales analytics including predictions.

Remember - This sense is typically used to store the data and quickly retrieve using high-performing database tool and search engines. Big Data is widely being used by Industries, relying heavily on a large volume of business databases. Big Data tools are such as Apache Hadoop, MongoDB, Cassandra and more.

Future is all about Intelligence, and organizations need to implement the above framework into their business operations for better decision making, superior customer experiences and breakthrough business outcomes. Intelligence Process Automation (IPA) under one roof, can seamlessly integrate to cater to business use-case specific automation needs, which are classified into Vital, Essential, and Desirable needs of the organization.

INTELLIGENT PROCESS AUTOMATION UMBRELLA – "ALL UNDER ONE ROOF"

Better use of data can enable a company to define problematic issues, find solutions to those issues, and have greater control and visibility into the business. However, most organizations fail to utilize almost 90% of the data that is available to them, the reason being, most of the available data is in silos, and more often than not, the organization doesn't have the right tools to process and analyze the large number of data sets. A study by New Vantage Partners showed how companies were failing to become data-driven. Respondents who stated they had "founded a data-driven company" decreased from 32.4% in 2018 and 37.1% in 2017 to 31% in 2019. Instead of a progressive digital change, there is a frustrating digital stagnation.

Considering the huge amount of data generated every second, there are organizations out there trying to grapple with quintillions of bytes of data every day, looking for an information management strategy to accelerate the flow of insights. They need to realize that doing so will only complicate their big data solutions, increasing implementation and maintenance costs. A data-driven organization is not necessarily one that uses every tiny bit of data coming in from every source, but one that makes smart decisions with an aim of accelerating business growth.
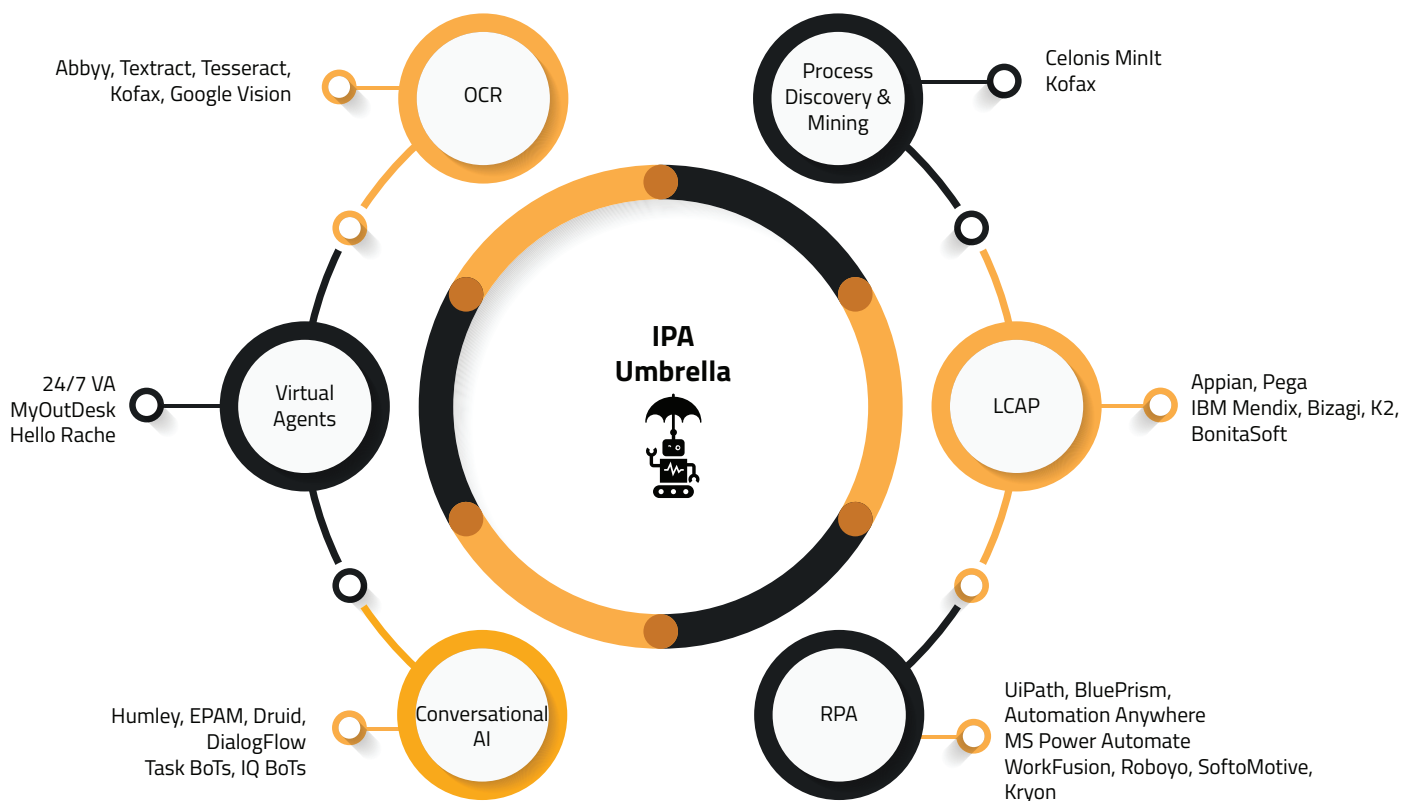

Fig 3: Components under IPA Umbrella

Forrester states "less than 12% of the enterprises have an enterprise-wide approach to automation. This strong focus on task-level and process-level automation remind us that automation often takes place in functional silos, with parallel but unconnected initiatives".
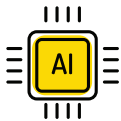
The IPA components are as follows:

Process Discovery and Process Mining	Low Code Application Platform (LCAP)	Robotic Process Automation (RPA)

Conversational AI	Virtual Agents (VA)	Optical Character Recognition (OCR) or Intelligent Document Reading (IDR)

PROCESS DISCOVERY AND PROCESS MINING:

Process Discovery and Process Mining have always been a "Point of Entry" into any new client account, for most high-end IT Consulting and System Integration (SI) companies. They ask strategic questions to the strategic team, operational questions to operations team and finally transactional questions to transaction teams.

It reminds the quote from Edward Hornet, "If you don't ask the right questions, you don't get the right answers. A question asked the right way often to point to its answer. Asking questions is the ABC of diagnosis." The diagnosis here is "Process Discovery".

Here is the undeniable quote "The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency." - Bill Gates.

They study the processes and sub-processes of the identified business functions and document the "AS-IS Status" and based on the immediate future business requirements and prepare the "TO-BE Status". They also do the "Fit-Gap Analysis" to demonstrate what the organization needs to do, to hit the target To-Be Status. Each sub-processes' 360-degree nature is analyzed with detailed Process Flow Diagrams (PFD) during this Discovery phase. Besides capturing information in terms of how many activities are purely manual, semi-manual, business applications used, resources employed, manual transaction processing time, manual errors, and rework time.

The ideal Process Discovery tool should be able to pick up the data/information from business endpoint and logs associated with the applications, for the Discovery team to understand the complexities involved, How much work is being done manual, overall manual transaction processing time and rework due to manual errors, caused and more.

There are quite a few vendors in this space and few notable, are Celonis, MinIt and Kofax and others.

LOW CODE APPLICATION PLATFORM (LCAP):

The upgraded version of the old Business Process Management (BPM) applications have a new "Buzz word" in the market today, called "Low Code Application Platforms (LCAP)". The LCAP tools are used to create complete business applications using "Drag-and-drop" and "Point-and-Click" interfaces rather than the conventional way of coding thousands of lines of complex code. With low code, IT can collaborate with business users to build modern business applications and deploy to host faster. The LCAP products typically come with a "Full stack Automation Framework" having workflow automation, business rules engine automation and Robotic Process Automation (RPA), workforce management, mobility, business case management besides AI features including Chatbots and Virtual Agents.

It reminds of the comment from Mr. Mel Kirk, CTO, Global Fleet Management Solutions @ Ryder. "In addition to improving the customer experience, the Low Code Application Platform (LCAP) reduces the latency of gathering documentation, accelerating retrieval of reimbursement for vehicle fixes and vehicle downtime".

Today, few products leverage the high-performing column stores database to process and store, a large amount of data. The commonly accessed data is pushed to Random Access Memory (RAM), which is faster to access and retrieve the required data, in disk storage.

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There are quite a few vendors in this space and few notable, are Appian, Pega, IBM Mendix and many more.

ROBOTIC PROCESS AUTOMATION (RPA):

Even after streamlining the business processes and workflows with ERP and BPM products, the need for human efforts has become inevitable, which is where the Robotic Process Automation (RPA) steps in.

RPA tools are known for their tactical, focused, and agile approach for accelerating the manual processes. RPA helps employees from mundane, repetitive tasks and leverages their human skills for more important tasks, where human-touch is necessary. According to Leslie Willcocks, Professor of Technology, Work, and Globalization at London School of Economics - RPA is one such great tools to enable the relationship change between technology and people in future for the better.

RPA focus is the automation of high-volume tasks using software bots. This is a much narrower focus than Business Process Automation (BPA), yet highly effective technology. Simply put, RPA hands, individual tasks, and activities, over to software robots to streamline and automate. In contrast, BPM takes an entire business process and automates it from start to finish, at the process level. RPA tools are widely being deployed to automate the corporate functional activities such as Employee Timesheet processing, Payroll and Reimbursement processing, Supplier Invoices processing for payment disbursements, Customer Invoices Consolidation and Dispatching.

RPA allows the organizations to automate their existing subprocesses in a simple way and at a reasonable cost to obtain direct business benefits.

100% Output Accuracy and hence 0% error	24x7 Availability	75% or more Productivity & Performance
90% or more Quick processing than manual FTE	10x faster onboarding process (Employee or Customer)	Reduced or no human intervention, with workflows and rule-based engines
Paperless and go-green	Can intelligently read documents, extract, and upload through inbuilt OCR capability	Structured communication within and outside the organization
Accurate remote monitoring and reporting	Increases visibility and streamlines business transactions	Cost reduction due to less FTE

Below is the illustrative example of how RPA is helping the business, in a Multi-Sales Order processing and Order entry into ERP's Order Management module in Sales Order Entry form.

 Business Scenario considered, for example:

 Sales orders are coming from multiple channels. There is always a need for an efficient team of 2-3 FTE to work round the clock, to pick up the order and enter the order system, for order processing. Our BoT does this work, and keys in the details into the Infor ERP sales order form, for further processing.
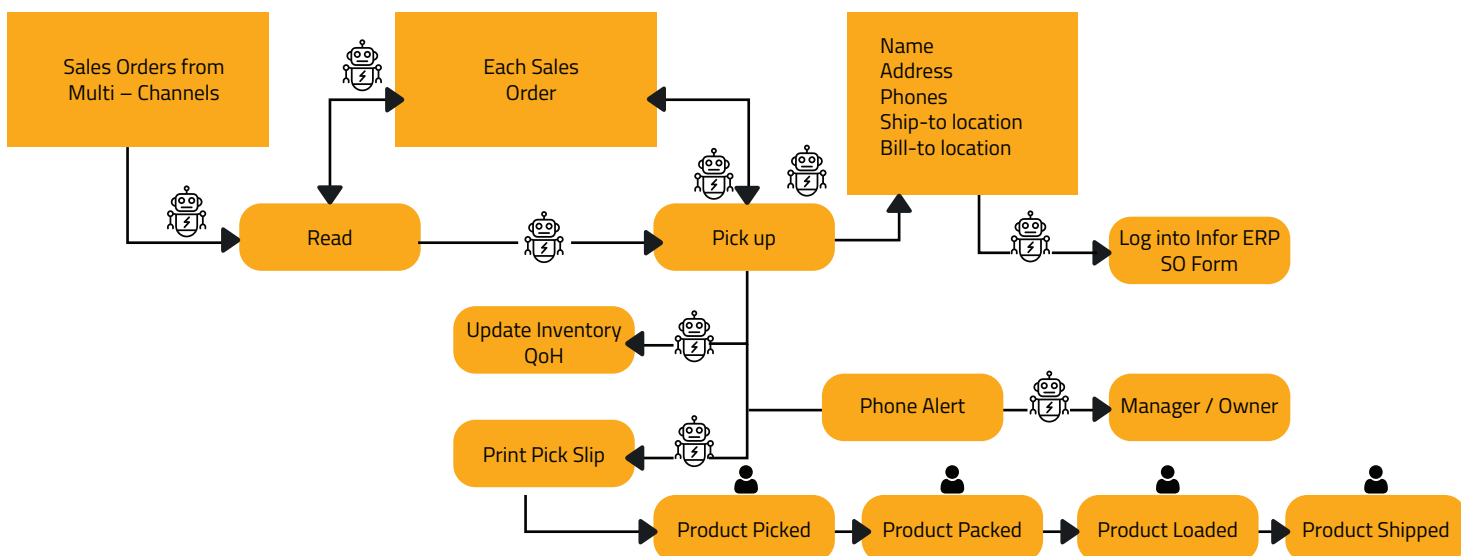

Fig 4: RPA processing Sales orders and filling Order entry form in ERP

RPA benefit is manual efforts replacement of 1-2 FTE with 100% accuracy and timesaving from 6 hours to 40 minutes, giving a direct saving of time and manual efforts by 72%. The replaced FTEs were deployed to provide personalized services to customers. Also, BoT can work round the clock; Orders can be processed anytime, deliver to the customers in any time zone of the world.
Few notable RPA vendors in this space are UiPath, BluePrism, Automation Anywhere
MS Power Automate, WorkFusion, Roboyo, SoftoMotive and Kryon.

CONVERSATIONAL AI

During any regular business hours, even after office hours, typically, organizations need to respond to calls or emails coming from their B2B and B2C channels across the world, and there has always been a need to deploy staff, on a 24x7 model, to receive the queries and respond with resolutions. This became a huge recurring cost to the organizations. They decided to offload the work, voice, and data-based Business Process Outsourcing (BPO) companies to operate seamlessly, process and manage their B2B and B2C requests.

Conversational AI is based on Chatbot and Virtual Agents technologies. These Chatbots, can work round the clock, understand various popular languages, receive the requests, understand, pick up the right answer from Knowledge base library, supply the resolution to the user in his language, within a fraction of second, and make the customer delighted. There are Chatbots available to greet the user, based on his time-zone. Voice-based Chatbots are gaining momentum, more than data-based Chatbots.

The customer is an essential part of the success of every business. While back-office automation is vital to alleviate strain and provide support to the front office, the front office automation can completely transform how companies interact, communicate, and engage with their customers and new prospects.

The Conversational AI has been gaining momentum, especially during the pandemic season, from March 2020, across the world. It is evident from many organizations' websites, where Chatbots are available to say hi to the user and supply the information requested.

RPA in the front office can assist your agent, making them more productive and improving your customer experience with shorter transaction times, reducing manual errors, and avoiding the highly irritating repeat questions for the same information. It can also open new communication channels on your existing systems, such as responding to customers' balance inquiries by text.

Many RPA vendors in this space and few notable, are Humley, EPAM, Druid, DialogFlow, Task BoTs and IQ BoTs.

VIRTUAL AGENTS

People often get confused between Virtual Agents and Chatbots. Chatbots are used for typical conversations and two-way communications; whereas Virtual Agents are typically expected to act in the role of an "agent" and perform at least some services for the user. Forbes clearly differentiate these two.

A virtual agent, sometimes called as Intelligent Virtual Agent (IVA) or Virtual Rep, a program software that uses scripted rules and Artificial Intelligence (AI) applications to provide automated service or guidance to human users.

Virtual agents are mostly used customer service functions to answer routine Customer queries, fulfill standard requests and handle simple problems.

For example, virtual agents are often used for initial Customer interactions with call centers or click-to-chat features on websites and to provide IT help desk services, such as employee requests for resetting computer passwords, access to few applications portals, access to specific sites, right to download from internet pages and also to install few applications of business importance.

There are many VA vendors in this space and few notable, are 24/7 VA, MyOutDesk and Hello Rache and more.

OPTICAL CHARACTER RECOGNITION (OCR)/ INTELLIGENT DOCUMENT READING (IDR)

OCR or IDR is a technology tool, used to read or recognize the characters, from the input documents or images and then populate the output in an editable and storable format, for the users to retrieve on business demand.

Below is the illustrative example of how OCR/IDR recognizes the characters from source input documents and challenges faced while reading the characters:
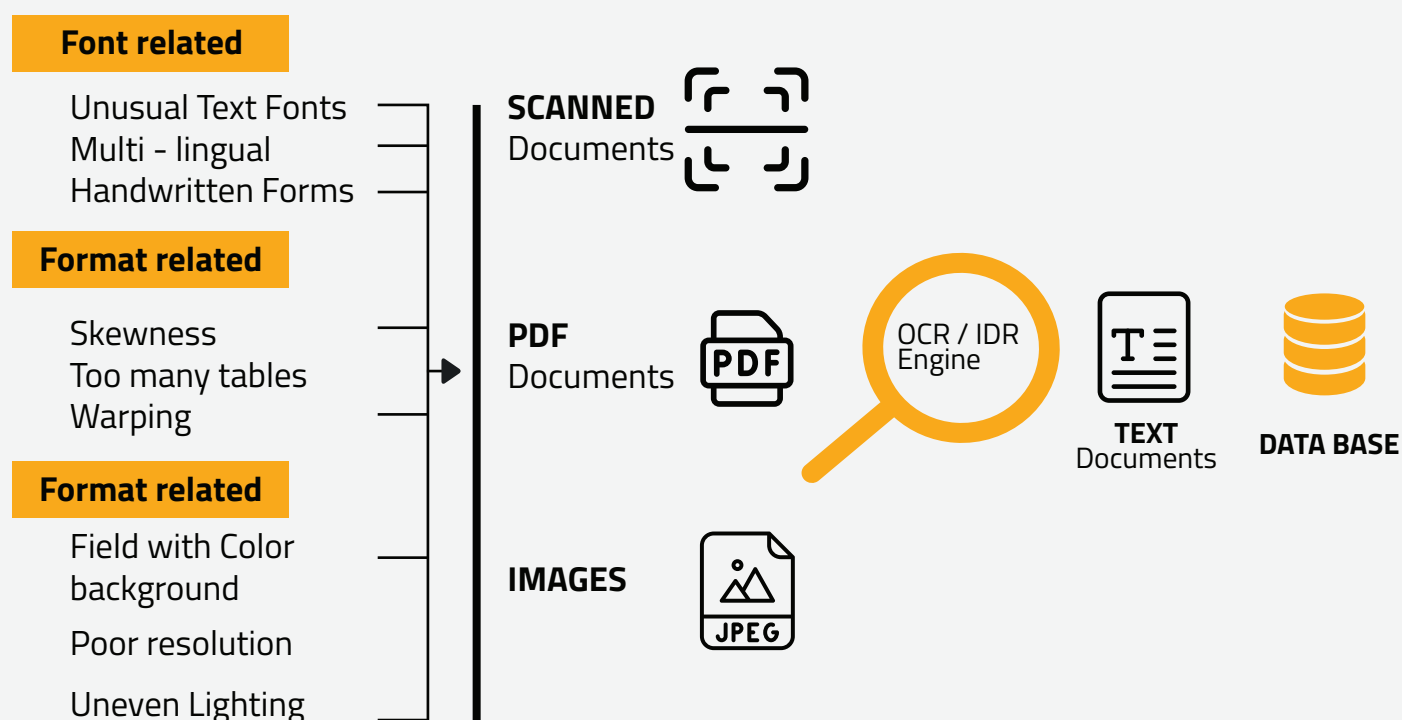

Font related
- Unusual Text Fonts
- Multi - lingual
- Handwritten Forms

Format related
- Skewness
- Too many tables
- Warping

Format related
- Field with Color background
- Poor resolution
- Uneven Lighting

SCANNED Documents

PDF Documents

IMAGES

OCR / IDR Engine

TEXT Documents

DATA BASE

Fig 5: OCR / IDR – Character recognition flow

If we consider the case of Supplier Invoices, typically, the challenges in reading are, as follows:

Unusual formats with multiple tables	Unique fonts and fields size	Multiple Languages (Imagine, Field Name is German, but the Input text is English)
Multiple Tax Categories	Collection Bill (Imagine a bill containing multiple invoices)	Any Shipment notes, handwritten on Invoices
Signature		

There are quite a few OCR/IDR products available today, and few notables are Abbyy, TexTract, Tesseract, Kofax and Google Vision and number of open-source online OCR engines.

SUMMARY

If Suppose the organizations aim to improve their operational stability and prevent errors and leverage the opportunity to become more Customer-Centric Organization and be better at service innovations while saving time and money, in that case they should plan for an "Intelligent Process Automation" journey.

We, the Digital Process Automation (DPA) CoE at, Happiest Minds Technologies Limited, are committed to assuring our best Process Consulting Services and Automation technologies, towards "Real Intelligent Process Automation Journey"., to help you achieve your futuristic automation goals and objectives, within a defined period of time and budget. Our DPA has well qualified and experienced experts, to help you choose the right automation tool for your need, help you automate the identified business processes and travel with you, during your Automation journey.

 Intelligent Process Automation is an ongoing journey towards Continuous Improvement (CI).Reach out to one of our DPA experts, and we would be happy to be part of your IPA journey -

https://www.happiestminds.com/services/digital-process-automation-dpa.

AUTHOR BIO

Rajakumar Duraimurugan has been with the DPA CoE at Happiest Minds Technologies Limited, as Director – Digital Automation. He has over 25+ years of experience across Enterprise Resource Planning (ERP), Business Process Automation (BPA) and Robotic Process Automation (RPA) including Conversational AI, Virtual Agents platforms and Optical Character Recognition (OCR). He has provided Consulting to many organizations in transforming to Digital Automation and helped them achieve direct saving on time and efforts by 45-65% while keeping the accuracy to ~100%, without disturbing the existing IT application landscape and business, across North America, Europe, Singapore, Thailand and China. Rajkumar has published 10+ articles in International Conferences, including few blog papers on Digital Automation, to his credit.

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