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The Today and Tomorrow of Robotic Process Automation

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***Abstract*: Robotic Process Automation automates the repetitive, rule-based tasks which are generally performed by humans working on software. This research paper dwells into how to achieve the same; we define what is Robotic Process Automation, why is it better than humans, areas of application, future scope and a practical implementation of it that we worked upon. RPA has the potential to take over all the business process management tools and artificial intelligence tools to give a one step, concrete solution that can be molded according to the needs of the organization. RPA and this research paper is useful for any company or anybody dealing with high volume data, high transaction processing functions etc. RPA is famous as a time, energy and money saving technology. We will highlight with the help of this paper the today and tomorrow of RPA.**

***Keywords*: Application analysis, Automation technology, Digital transformation, Humans vs. Robotic process automation, UiPath, Workflow.**

1. Introduction

A cut in the huge labor requirements and costs is a dream come true for every enterprise, RPA is one tool that has and will overtake the business industry by a storm. Robotic Process Automation has proved to be one of the most advanced sciences in the areas of IT, CSE and ECE. It is a combination of hardware and software, networking and automation for completing the mundane, repetitive tasks of an organization with the help of a software bot, our robot.

On the off chance that Companies don't set up this innovation in its activities, they may not stand anywhere in a business rivalry in the distant future. Awareness is a key aspect of robotic process automation through the ability to conduct customer analytics, data mining, social media analysis, and data warehousing. Robotic Process Automation is a Technology that permits individuals to arrange and program computers or a robot to accomplish a set of tasks like data processing, screen scratching, information rejection, reaction activating and sending and accepting information with advanced frameworks that can be done without human mediation. Artificial Intelligence and Deep learning has been taken to another level by Robotic Process Automation. With this kind of innovation robots can make ongoing choices without the assistance of humans. RPA has made robotization dynamic wherein we can decide the workflow, link different workflows together and automate different tasks.

2. Upsides of RPA

A. Low cost of operation

In both IT and business process environments RPA has reduced labor costs by 25 to 40 percent. While numerous organizations, huge and little, will discover RPA diminishes their requirement for human work, lessens handling times, and lights the capacity to effectively interface with outside frameworks significant to their base lines, there are numerous different advantages of RPA. For example, RPA changes the guidelines of the game by permitting associations to ceaselessly screen business or IT forms and the conduct of work force and programming applications as a component of those procedures. That observing of examples and occasions is performed by virtual engineers (robots) that can really learn by watching process-based exercises embraced by human engineers.

The consequent information accumulated through machine perception would then be able to be joined into future inferences made during activities. Therefore, RPA can be utilized to distinguish an anomaly, thereby transforming laborers into issue solvers, it can likewise start a lot of activities to react to the event.

B. Improved data analysis

Every task assigned to the computer yields some data, this data can be stored in a database and can be used later for decision making purposes at both micro and macro levels. This happens because of high availability of data from different sources.

C. Increased regulatory compliance

In sectors such as healthcare, banking, insurance there is a need for strict compliance to regulations. Here is where a robot

is much more efficient than a human as each step of the IT or business process is well documented and tracked in the system. It is much easier to comply with audit and industry regulations and standards.

D. Higher employee productivity

As the robots handle the mundane, repetitive and programmable tasks, employees can focus on more productive activities like problem solving, decision making, meetings, interactions etc. This also increases the employee's will to work and productivity because of intrinsic motivation coming from new challenges.

E. High accuracy

When a machine performs a task rather than a human employee it's highly likely it's going to be error free. It is important to test, train and govern the software but processing errors are easily eliminated. For the solution to our task to be completely free of errors, we can use proper mapping of sub processes and optimization.

F. Logistical upside

There is no need to waste time, energy and money in recruiting and training employees. Also there are no language, cultural and social barriers. Scaling software is much easier than scaling the workforce of an organization.

G. Non invasive

RPA can be implemented in such a way that it does not interfere with the privacy policy of an organization and can offer multiple views for multiple users as it interacts with data in the presentation layer of an application.

H. Increased efficiency

Obviously robots don't get sick, take time off, not even paid sick leaves. Robots can work round the clock and can handle more workload with higher efficiency than humans. It's human to err, but you don't have to put up with mishaps when using a bot.

3. Areas of Application

RPA alone is finding use in all the major sectors, not only that RPA coupled with Machine Learning, Artificial Intelligence and other cognitive technologies is bringing a wave of change and is referred to as Intelligent Automation, Smart Process Automation and Cognitive Automation.

Some of the industries below have already adopted RPA and enjoyed its advantages:

A. Banking sector

As the banking sector deals with huge amounts of data and dainty information, there is a need for efficiency, customer satisfaction and quick turnaround time. That is where RPA comes into play.

1) *Customer service:* RPA can deal with low priority customer queries and humans can focus on high priority queries.
2) *Account Payables:* Post reconciliation and validation, RPA can help with vendor invoice processing and payments to vendor accounts.
3) *Account Receivables*: Processing of incoming payments and payment of customer dues can be automated.
4) *General Ledger:* Updating and collection of financial data, assets, revenues, expenses, liabilities etc. can be automated as well for accuracy.
5) *Credit Underwriting:* RPA can help with verification of credit card applicants by using internal and external data.
6) *Compliance:* Banking sector can benefit hugely by complying with the regulations, this is done using a proper audit trail that RPA uses.
7) *Credit Card Processing:* The tedious task of background verification, document verification, credit checks can be done using RPA to declare an applicant as eligible or not eligible for procurement of credit card.
8) *Consumer Load Processing:* On the basis of predefined rules RPA can check the eligibility of the loan applicant by automating the credit checking task.
9) *Fraud Detection:* The if-then analysis feature of RPA can detect anomalies and thereby detect frauds in the system.
10) *Report Generation:* RPA automates the report generation tasks and does a great job in organizing, validating, double-checking the data from different sources to be shared with the stake-holders.
11) *Account opening/closure:* Opening an account or closing it is easy using RPA as it has repetitive, programmable steps which can also include the minor exceptions.

B. Accounting sector

Most of the auditing firms use RPA because of the overwhelming amount of data and the time consuming process of handling it. RPA helps with data auditing that doesn't require an audit judgement at every step. Following are the ways RPA helps in this sector-

1) *Data collection and cleansing*: The data collection, manipulation, cleansing, validation, checking for duplicates can be done using RPA with high accuracy.
2) *Controls Testing*: Auditing division of duties, access controls, reporting of exceptions, change management controls etc. can be automated.
3) *Risk Assessment*: The annual risk assessment report of an organization can be generated using RPA by identifying core trends during collection and classification of data.
4) *Reconciliation*: RPA can reconcile data coming from various sources against predefined rules, making the entire process error free.
5) *Audit PMO*: RPA can send reminders, check progress of a project, automate reports and identify open items.

C. Insurance sector

There are many potential back office operations of insurance

companies that can be automated to increase customer growth, some of them have been mentioned below.

1) *Claims Processing*: By automating the collection of data from various sources and integrating them into one cohesive database can speed up the claims processing.
2) *Underwriting*: Risk assessment is an integral part of insurance companies and that can be done using RPA with high accuracy and efficiency by utilizing data from various internal and external sources.
3) *Appeals Processing*: This process can be expedited by automating the extraction of data from policy papers and claims decision documents using RPA.
4) *Data collection and cleansing*: It's important to have high quality data in the insurance sector. The collection of data, removal of duplicates, data filling by default, formatting etc. can be automated.
5) *Policy cancellation/New policies*: Using RPA to automate various processes involved in policy opening and cancellation as well as maintaining proper audit trail of the same.
6) *Business Process Analytics*: RPA allows for a very transparent system of handling data that can also generate reports, show exceptions, count the number of documents verified, look for loop holes etc. this allows a review of policies and leads to better decision making.

D. Retail sector

Accuracy and productivity are two things that can be a deal breaker for retail companies. RPA can be utilized for many manual processes of this industry.

1) *Customer Support*: RPA has been a major tool in tracking orders and providing order status to the customers as well as automating the feedback process for better services in the future.
2) *Returns Processing*: Inventory management, returning back products, customer points etc. can be automated using RPA.
3) *Price comparison and Product Categorization*: For better decision making, price comparisons can be automated by collecting data from several stock keeping units.
4) *Accounting*: The accounting tasks in retail can be automated such as financial filing, financial closing, account payables, account receivables etc.
5) *Market Analysis*: RPA can automate the task of market analysis, forecasting demand and supply on the basis of data as well as consumer behavior analysis.
6) *Logistics and Supply chain*: Based on configured events communication with customers/vendors, inventory management, shipment tracking etc. can be automated.

E. Manufacturing sector

For manufacturing companies improvement in speed, scale and simplification of operations can be very profiting. Manufacturing processes that can utilize RPA include,

1) *Bill of Materials*: RPA can help by managing data that include bills of raw materials, components and subcomponents that are needed to manufacture products. Hidden costs can also be managed.
2) *Customer service*: RPA allows for automated email communication and resolving repetitive customer queries for giving them a better experience.
3) *Logistics*: Goods in transit can be effectively managed and monitored by using RPA. Insights are helpful for decision making using statistical data.
4) *ERP Automation*: Enterprise Resource Planning tasks can be automated using RPA. Report generation is one of the key factors which include pricing, payables, and receivables. RPA enables proper customer and vendor management.
5) *Data migration*: Migrating information from legacy sources to the ERP system requires accuracy and RPA can be of great help in this case.
6) *Manufacturing Analysis*: The whole manufacturing process can be analyzed using RPA. From project execution to exceptions and bottlenecks, everything can be identified and can help smoothen the process.
7) *Compliance*: RPA has proper audit trails which help in compliance.

4. Practical Implementation

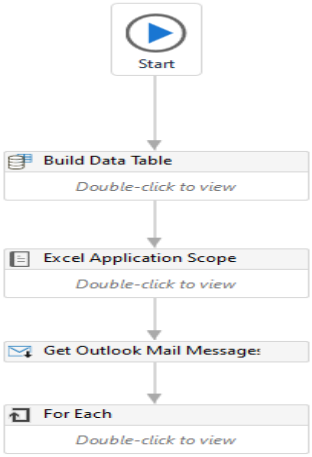

Fig. 1. Workflow for email capture

1. We created a bot which works over Outlook to gather data such as unread emails, read emails, etc to an excel sheet which can be studied further and worked upon for various studies and purposes.
2. Certain tools are used for implementation of RPA like UiPath, Blue Prims, Automation Anywhere, etc.
3. We used Ui Path as a tool for creation of the bot because it provides GUI interface, free community edition for students.
4. UI path gives the same computing capabilities that a human has to a bot using certain activities like workflow, orchestrator, UI automation.

5. Before running the bot we carried out the process manually to gather data and then compared it by replacing human efforts by a bot.
6. The result was reduction in error, time and cost and the efficiency increased. The more the amount of work, the better the efficiency and cost of a bot.

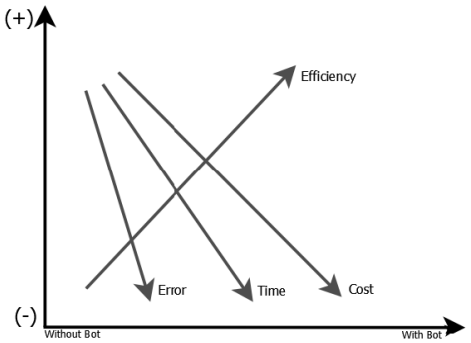

Fig. 2. Graph showing difference without using a bot vs. with a bot

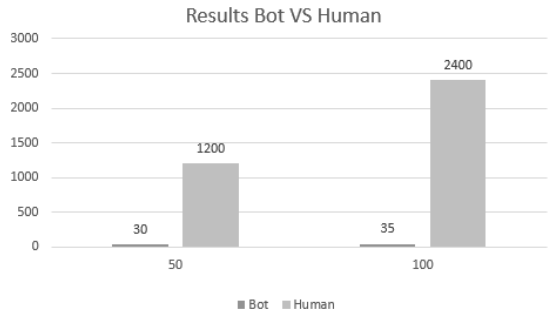

Fig. 3. Test results

5. Future Scope of RPA

Traditional automation requires a human expert to design the workflow but the future lies in cognitive technologies so that these soft bots can deal with unstructured data and process natural language. Artificial Intelligence, machine learning and big data are some of the technologies that will support RPA to transform our future. Because of growth in devices connected to the internet (IoT) and big data there is an opportunity for RPA to work on unstructured data more often. This enables it to find unusual patterns in the business processes thus helping in decision making.

As advancements and growth is taking place in cloud based services, organizations do not have to have a local server or powerful computers on site. Unlimited, on-demand and off-site access to data storage can further ease the task of RPA. Cloud services also allow automation of more complex processes by providing computing resources. Because of such advancements we can expect RPA services to become more integrated with cloud services and big data in the future. If we further incorporate machine learning into the picture and natural language processing RPA could make decisions for itself and solve complex problems and automate complex processes by learning. RPA will be able to cover not just structured data but unstructured or semi-structured data as well which means there will be very little for the humans to do.

Businesses and IT as a whole could benefit from smart bots as they can handle exceptions, learn from previous experiences, look for patterns and even take important decisions with little to no human intervention. We cannot forget that the biggest advantage of using RPA is that it gives humans ample amount of time to work upon the existing technologies and new inventions which guarantees a future full of technological prospects.

6. Conclusion

More and more organizations are being a part of the RPA bandwagon and in the coming years we can very well expect RPA to reduce the human workforce by more than half. Data for any organization is of utmost importance and RPA is a befitting tool to handle it. RPA sits on top of all the advancements taking place in IT technologies as it is a tangible tool that can be implemented in any organization and can be molded according to the context and scope we are dealing with. RPA is not a quick win solution, it's more of a platform which when deeply understood leaves no field behind and can automate tasks which we never thought of. We have to be extra cautious when training the robot and governing it because contextual changes can make some major blunders, therefore proper expertise is advised to do the same.

As the market is becoming more demanding robots have an undeniable edge over humans and are the need for tomorrow. For any organization, either they can be a part of this wave of change or drown because of it.

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