Robotic Process Automation (RPA): An Industrial Overview

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Abstract- *With respect to transformation regarding digital fields, which is progressing at continuous patterns and its growing so much. Robotic Process Automation is drawing lot of attention and interest from the corporate and IT sector which makes it kind of Interesting and worth the time. While RPA which is the most popular field of interest for the corporate and IT sector companies, but with the context of academic research there is a lack of information regarding the theoretical analysis and synoptic form. RPA is one of the advanced technologies which connects branches like Computer Science, Electronics and Communications, Mechanical engineering. It is a kind of technology which composes of both hardware and software requirements. RPA offers the software robots which can do the work of a human brain. RPA is equipped with engines related to AI such as machine learning and computer vision and they both can help the robots in automating the human activities which can be recorded by the robots.*

Keywords- Robotic Process Automation, Robot, Automation, RPA, Machine Learning, Technology, Workflow automation, AI

I. INTRODUCTION

Robotic Process Automation is a new emerging technology which allows anyone or everyone in these days to configure a computer software, or a "robot" to emulate and combine the actions of a person or a human being interacting with different kinds of digital systems to execute all the business and market processes. The tasks performed by robots are rule-based, proper structured and repetitive. RPA robots utilize interface which is suitable for a user to work on and captures data and manipulate all the kind of applications, does the same kind of work as human does because it is computerized with the software's related to Artificial Intelligence. The robots interpret, trigger many kinds of responses, and communicate with other kinds of systems in order to perform on a vast and different varieties of repetitive tasks. Only substantially we can say that RPA computerized software robot never sleeps and does not make any kind of mistakes.

RPA is a system which is aimed at automating the business and market processes via the business logic and user inputs. RPA are predicted to have a potential impact on the economic part which is of $6.7 trillion by the end of the year of 2025 which is according to the Trecent report automation technology. Based on the statistics at current scenario, RPA is expected to grow into one of the leading and raising platform with respect to technology and will be standard for the performance. It is a developing technology which still relies on AI screen scraping and workflow automation and it elevates all these technologies to a new level of advancing the capabilities and can be significantly be improved in all ways. Rather than being dependent on codes, the software provides tools for all the users and can be used to build the workflows in a way which is visual and entirely dependent on coding knowledge. AI can help the software of automation for processes that do not require any kind of complex decision-making analysis, such as NLP or online customer support. It can be said that future of RPA is a coordination of all these technologies.

II. EXISTENCE OF RPA

With the combination and mixture of artificial intelligence, screen scraping and workflow automation, RPA came into existence in the early year of 2000. The RPA kind of uplifted all the capabilities of the three technologies which are a mixture or combination, by making a huge impact on the market area, business fields, IT Sectors and Corporate Industries.

Since it came into reality due to the predecessors, it was mostly dependent on these two namely the workflow automation and screen scraping. It brings drag and drop processes and uses OCR which is optical character recognition technology to capture all the data from the changing website.
Sometimes, there are many people who will be wondering or thinking about how RPA and AI are related to each other, it

can be said as that, RPA lets the person to configure the robot to collect the data, recognize patterns and then be acceptable and adaptable as per the entire requirement. The collaboration between RPA and AI, lets you perform a decision-making which is complex.

III. CHARACTERISTICS OF RPA

The focus is on enhancements to functioning efficiency, quality of work generated, simpler and quicker implementation and integration with other systems, and enhanced risk management and accordance.Due to the fast implementation, the low cost,and the rapid increase in productivity, RPA tends to be less vulnerable to the IT absurdity.The current literature on automation in general provides different insights into the benefits andrisks of automation on employment.

Within the field of automation, RPA is a quickly expanding software tool within the expanding market ofautomation. Also, due to the novelty of RPA, there is uncertainty about the impacts of RPA on engaged jobsand the altered processes.

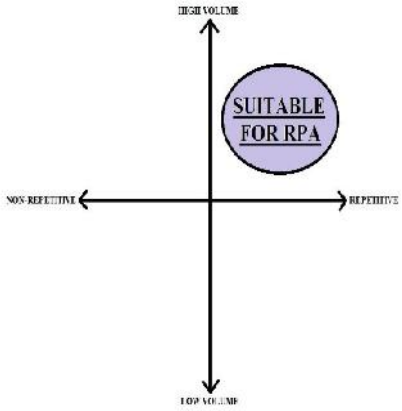

Fig:Processes suitable for RPA

Robotic process automation is very vital for theconstructive activities of industrial and manufacturingcompanies since it improves production rate, saves time,and improves the quality of production.

Major Characteristics possessed by RPA are:

1. **No programming code needed**

Making usage of RPA does not require programming knowledge. Employees only need to be skilled on how RPA performs which is generally very easy to understand. This provides it an advantage over the conventional methods of automation.

2. **User friendly**

Robotic process automation software is usually very easy to comprehend and use. No special kind of knowledge is required by users to make use of RPA.

3. **Not disruptive**

Contrastingly the traditional automation methods which typically include complex processes for transformation, the transformation processes in RPA are very simple and straightforward.

4. **Rich-analytical Suite**

RPA software comes with a rich-analytical suite that reveals the execution of the robot workforce. Most enterprise level RPA monitors and handles automated tasks from a central console. This console can be retrieved from anywhere and offer basic metrics on robots, servers, workflows, and more. The wide-ranging operation analysis not only allows the users to track the operations and identify issues, but it helps with simplifying future workloads. This solution of RPA needs no amalgamation because everything is inbuilt and all set right out of the box.

5. **Security**

If an organization performs on automation, an ample number of users will likely request access to the RPA product. Here, it is vital to have strong user admittance management features. Therefore, RPA tools include role-based security capability to ensure action specific permissions. In addition, many robotic process automation tools facilitate the configuration as well as customization of encryption competencies for securing certain data types to protect against the interruption of network communication. The entire automated data, audits, and instructions retrieved by the bot are encrypted to prevent malevolent tampering and ensure the truthfulness of historical record compliance. Moreover, the enterprise RPA solutions also offer comprehensive logging of users' actions as well as each task completed. This highlight assures internal security and retains compliance with industry regulations.

6. **Simple Bot Creation Interface**

RPA tools allow establishing bots quickly and easily by capturing mouse click and keystrokes with built-in screen

recorder modules. Many RPA products involve the option to create and edit bots manually using the Task Editor.

7. **Source Control**

The method lets secure storage of each version of a process in improvement with no risk of being erased. The source control method permits developers to examine the difference between versions of a certain process to find out what has switched. Likewise, the control room element in some RPA products permits scheduling bots, handling bot's versions, maintaining a log of user & bot activities, and managing users & roles. This element can suggest auditable management as well as control over the RPA environment, including clients, bots, users, and programs. It also similarly performs as the single-point-of-access & control for bot execution.

8. **Hosting and Deployment Option**

The RPA system is meant to offer a customer deployment through virtual machines, terminal services, and cloud. Among the other deployment substitutes, the cloud distribution draws the most customers for its scalability and flexibility. Adding to this, the RPA system is vigorous enough to instinctively deploy robots in groups of hundreds. This feature comprises an agentless configuration and proactively excludes the central server synchronization problems and runtime updates by safeguarding client configuration as well as bot deployment commonality. Therefore, businesses can install RPA tools on desktops and deploy it on servers to retrieve data for completing repetitive tasks. Similarly, they can also allow multiple bots to run different works within a single process whilst processing a soaring volume of data.

9. **Rules-based Exception Handling**

RPA system supports deployments with rules-based exception handling. This feature manages the exception in a progressive manner.

10. **Debugging**

The greatest benefit of RPA from an expansion standpoint is its capability to go through a process and adapt vigorously. Some RPA tools need to stop running to make the alter and replicate the procedure. Other RPA tools permit vigorous interaction while debugging. It also permits changing variable values to test different conditions without start and stop the running. This dynamic approach of debugging permits to expand on the fly and to solve problems in a production environment without necessitating changes to the process.

11. **Less Script or Script Less Automation**

The contemporary RPA tools are code-free and can automate any application in any department where the admin or clerical work is conducted across an enterprise. Hence, the employees with scarcer programming skills can create bots, just through GUI and different intuitive wizards. This low-code or less code development platform reduces the amount of hand-code-writing and facilitates quicker delivery of business apps. In addition, this platform lowers the initial cost of installation, training as well as deployment.

12. **Seamless Integration**

The core enterprise RPA integration is combining with the various 3rd party applications in the digital infrastructure of businesses. With unified integration, RPA tools provide unparalleled flexibility in assessing the digital workforce performance.

13. **Optical Character Recognition (OCR)**

Reviewing the optical character identification in the RPA platform turn into a new trend today. Some RPA vendors begin increasing the capability of the RPA portfolio by taping improved OCR to comprise simpler data abstraction from documents and images. The most fundamental feature of RPA tool is screen scraping that pacts with capturing bitmap data from the system screen and cross-check it against stored details to decode it. This is accomplished by combining with OCR engines like Google and Microsoft. In addition to text recognition, it retains the capability to structure data while reading well-defined records. Invoices, tax forms, claim processing, and rating manufacturers are some document sets that make client entails OCR with RPA initiatives.

14. **Actionable Intelligence**

The actionable intelligence facet of the RPA refers to the ability to gain and apply knowledge as skills. Robots that procure both regulated and unregulated data translates it into information and transforms the information into actionable intelligence for the end user or customer. The AI and cognitive intelligence are the mundane aspects of RPA solutions. They can consist of machine learning, computer visions, and cognitive automation to help bots improve decision making over the period. Hence, most of its functionalities can be automated not including the need for extra extensions.

15. **Increased Accuracy**

Any process that requires manual data entry or data transformation establishes the opportunity for inaccuracy. While humans experience fatigue and distraction, an automated procedure can run 24-7-365 and utilizes computer memory and programmable rules to guarantee reliability and accuracy. In a bank, data entry and transcription inaccuracies can result in intensified rework, decisioning based on inaccurate data, and negative financial effects and fines.

IV. USAGE OF RPA

The key aspects on which the usage of RPA is instituted are the profitability, rapidity, efficiency, interoperability, and traceability. These are subsequently explained ahead.

1. Profitability

The advantages of RPA in terms of cost savings and revenue generation not only hugely outweigh the costs, but they do also so swiftly.

2. Rapidity

One of the most important benefits of RPA is its rapidity. Robots can accomplish routine, rules-based tasks far more swiftly than humans. They do not get side-tracked, make typos, or forget the sequence of processes in a process.

3. Efficiency

RPA also brings main competences to an organization by freeing employees from mundane tasks and letting them concentrate on the tasks where humans excel, which include thinking, communicating, and problem-solving.

4. Interoperability

RPA robots can automate the procedure of accessing different systems all over an organization—because they duplicate what a human does on a computer. If the humans previously have access, the robot can easily get access too—no need for a huge new system.

5. Traceability

For several firms, having a comprehensive record of transactions and transfers of money is important to ensure regulatory conformity. Since an RPA robot follows a particular series of steps for each process, it also records each step as it executes. Blended with platform security, RPA's audit trails permit compliance teams to scrutinize each activity in real time.

These procedures tend to be rules-based, repetitive, and large-scale. Or, simply so complex and tedious involving multiple different business applications that nobody wants to do the task again and again. Let us look at a few circumstances where clients tend to see greatest return on investment.

1. Claims arbitration

With insurance companies often relying on a variety of legacy software platforms to keep trace of and arbitrate claims, RPA delivers extraordinary savings as insurance processes fit seamlessly into the "rules-based, repetitive, and large-scale" classifications.

2. Procurement

The combination of the purchasing department and the accounts payable systems is an perfect candidate for RPA.

3. Data entry

Data entry is the essence of repetitiveness. Since RPA has the potential for fundamental pattern recognition, it can transform nearly all kinds of text into editable and searchable machine encrypted text, so the need for manual data entry is lessened.

4. Resolution

By evaluating documents such as cash and bank statements, the process is to ensure the consistency of the records. The software bot can operate data extraction from the bank statement, thereby expanding the possibility of precise comparison. By finding and granting matched orders, bots can also match acquisition orders with delivery notes.

5. Workforce

If your company depend heavily on heritage systems, it may not be easy to implement the latest workforce software. Software robots can be useful to help automate the process.

6. Report generation

Frequent reporting is necessary. Software robots can not only automatically encapsulate the data necessary to generatethese reports, but they can also be supplied to allstakeholders. It is not complicated at all to see how this easesthe burden of compliance.

7. Customer service

With the arrival of chat bots, RPA can be leveraged to immediately query legacy back-end systems every time a customer asks a question to provide a much more customized answer than what a chat bot could provide by trusting on machine learning unaided**.**

8. Sales activities

Talking about the data duplication, creation and provision of invoices, smooth update of CRM (Customer Relationship Management), and so forth. Sales are an essential aspect of all kinds of business, irrespective of size or domain. The good thing is that software robots can cope with this. For example, automation allows to deliver invoices to customers much quicker than by doing it manually. More generally, the need for error-free sales activities is vindicated by the need to avoid customer complaints and disappointment, which is the result of organizational blunders**.**

V. FUTURE OF RPA

Robotic process automation (RPA) is changing business procedures in almost every single industry by rationalizing data entry and other low-level tasks. Currently the innovation, which fills digital forms in a small amount of the time it takes people to do similarly, is getting a long-overdue upgrading. Advancement in machine learning (ML) and artificial intelligence (AI) is making businesses prepared for intelligent automation (IA), a more splendid brand of RPA that figures out how to implement entire business procedures with context, instead of as a series of discrete tasks.

With RPA's developer tools, its execution is becoming to a larger degree a space for software robot developers, not as much for easy-going business users. Software robot developers require to embrace all the agreed procedures of developers, so revealing and reusing code turns into an mundane method of working.

The requirement for open-source RPA software is going to rise. With taking the whole thing into account, companies favour open-source solutions since they offer more clarity and will, in common, be less costly as companies simply need to pay for services.

These enhancements favour open-source RPA. What is more, we are seeing expansion in the open-source RPA ecosystem with new organizations being launched. If a revenue-driven organization can develop a competitive RPA product, it could promise a huge portion of the RPA market. We do not yet see such a solution in the market.

After some time, larger organizations that are as of now utilizing RPA will search for additional tactics to utilize automation tools to be gradually more effective, with the predictable act of outsourcing operational tasks to low-cost regions being displaced by a wealth of in-house RPA developers. This practice will see programming robot developers computerizing work and outsourcing tasks to robots to help enhance employee efficiency and improve job satisfaction. RPA easier and faster to implement, cognitive automation enables RPA to use AI and machine learning to broaden the scope of procedures it can automate.

The next level of automation will be revealed when machine learning capabilities and artificial intelligence become smart enough to implement RPA intelligently. In any case, to look at automation as the most crucial thing in the world is to overlook the master plan, one where automation is just a single part of accomplishing procedure excellence. It is a section that should be coordinated with regards to that wider vision, close by various tools that deliver what RPA alone cannot.

VI. CONCLUSION

To conclude with, many organizations aim to achieve the objectives regarding their strategies by investing in RPA and its technologies to improve their existing processes and operations related to businesses and market. To understand preparation, selection, and implementation of RPA, many organizations take or consider advice from vendors and consultancy organizations. These days there is an increase in interest in RPA from industries, IT sectors and in the perspective of academics and studies. So, in this paper we present key insights of characteristics of RPA, uses of RPA and the future of the RPA and how it came into existence. The paper we are making will be as an important call of action to synthesize and extend techniques from a type of disciplines including artificial intelligence, machine learning, screen scraping and many more, evaluate more intelligent and robust suites of bots.

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