Review Paper on Robotics Process and Automation

Yuvati Digambar Barange, Vaidehisudhir Gorale, Sarvadnya Vilasrao Ingole,
Pratik Narayan Katore, Sarang Kalyanrao Behare
3rd Year, Mechanical Engineering
Dr. Rajendra Gode Institution Technology And Research, Amravati, Maharashtra, India
yuvatibarange@gmail.com, Sarvadnyaingole11@gmail.com, Pratikkatore78@gmail.com
Vaidehigorale38@gmail.com, Sarangbehare2003@gmail.com

Abstract: *Many software automation techniques have been developed in the last decade to cut down cost, improve customer satisfaction, and reduce errors. Robotic Processautomation (RPA) has become increasingly popular recently. PA offers software robots that can mimic human behavior. Attended robots work in tandem with humans operate while the human agent is active on the computer. On the other hand, unattended robots operate behind locked screens and are designed to execute automation that don't require any human intervention .RPA robots are equipped with artificial intelligence engines such as computer vision and machine learning ,and both robot types can learn automation .By recording human actions*

Keywords: Robotic Process automation

I. INTRODUCTION

Robotic Process Automation (RPA) is the new technology that aims to create software robots that mimic human behavior .transitioning to RPA,enterprises aim to reduce labor costs, increase productivity ,reduce error rates and improve customer satisfaction .increasing average cost of worker around the globe (The Biggest Cost Of Doing Business: A closer look at labor costs,2018)(United states Nonuniform Unit Labour Cost,2018)enterprises adapt the RPA technology very fast in the past few years. RPA has become one of the most trending technology in many industries .this chapter will introduce the RPA technology and discuss it,s social implications.

In general, RPA is a system aimed at automating business processes through business logic and user inputs. RPA application processing a transaction, manipulatingdata, triggering responses and communicating with other digital systems.(Boulton ,2018)According to a Trecent report potential economic impact of 56.7 trillion by the new year 2025.according to the same report ,the automation market will have the second largest economic impact only behind the mobile.

II. HISTORICAL CONTEXT

One of the pathbreaking technologies that has taken the business world by storm is Robotic Process Automation (RPA).also known as software robotics, RPA uses automation technology to mimic human Backoffice tasks, such as: combining API and user interface (UI) interaction to integrate and perform repetitive tasks across enterprise and productivity application .RPA bots provide scripts that emulate human processes and automate multiple activities and transaction independently without human intervention.

FORE FATHER OF RPA

RPA combines multiple technologies into one toolkit for various automation purposes .RPA was coined in the early 2000s, but the first developments of RPA is machine learning (ML) .

It enables computers to perform important tasks such as translations and text summaries .screen -scraping technology is considered an important step in creating RPA .this technology extracts data from the web ,programs ,and documents, further viewed in another application. Although screen scraping had many advantages over manual methods ,it was also

515

somewhat limited limitation and lack of availability of source code, programmers and documentation made it difficult for the average business user to understand it.

DRIVERS CONTRIBUTING TO THE RPA EVOLUTION

Drivers that have contributed to the RPA evolution include:

AUTOMATION

Workflow automation is a process involving a series of automated action that help reduce human work .these action should be iterative so that steps are predictable . such actions can be automated management tools. Workflow automation uses business rule to determine when one step is ready to beginexecution .the automative and electronic sectors will drive a significant increase in global shipment of industrial robots ,which accounts for about 23% and 31% of new installations in 2020 , respectively .

Automation in it's original form has existed since the industrial revolution it briefly describe the process that takes place without manual input .in the 1990s automation was introduced into computer processing .in particular ,the rise of graphical user interface has created a need for automation at every level.

WORKFLOW MANAGEMENT

In its simplest form , workflow streamline everyday processes and activities .they are essentials for any business looking to build complex processes, form production and internal task management to lead and customer follow -up workflow management is the "p" in RPA .it is a over the years ,the third factor of RPA has moved more and more toward that position.

III. ARTIFICIAL INTELLIGENCE

Artificial intelligence is the ability of computer machine and robots to perform task that normally require human intelligence .AI programming depends on three technique: learning ,reasoning , and self correction . artificial intelligence applications are endless and capable applied in various fields and industries .big data is projected to reach 163 trillion gigabytes by 2025 . the big data growth is driving improvements in AI algorithms .

MODERN RPA CONCEPT

Key trends in modern RPA concepts in RPA are ;

Industry specific RPA

Organization in various industries , like healthcare ,IT, finance ,and manufacturing ,include specific automation needs based on their day-to -day operation .for this reason ,there is an increasing tendency for RPA vendors to develop out-of-the-box ,industry -specific solution tailored to the need of these companies based on their industry .

Widespread Adoption of cloud based RPA

The move to a fully cloud based RPA solution is one of the notable RPA trends .most vendors today offer on premises solution to build robots that automate routine and manual tasks .as more and more companies store their data in th cloud ,RPA solutions are also available to enable rapid system integration and data access .

CURRENT STATE OF RESEARCH

Robotic Process Automation (RPA) is a technology that uses software robots to automate repetitive tasks .its being used across industries to improve efficiency ,reduce costs ,and minimize errors.

CURRENT STATE

RPA is widely used across industries ,including finance ,healthcare , manufacturing ,and retail.
RPA is used to automate rule based tasks ,such as data entry

RPA is expected to grow rapidly , with the market size projected to increase from $3.79 billion in 2024 to $81.8 billion by 2032.

RPA is being used to streamline workflow ,reduce human error ,and free up resources for higher value activities .

TECHNICAL CHALLENGES

Integration with existing system

One of the first challenges businesses must consider when planning RPA implementation is compatibility with the currently used software .PWC reports that 45% of companies using AI and robotics have encountered difficulties with development or integration .A company ,s existing systems often combine different technologies ,user interfaces ,and protocols that need to stay in sync .An inappropriate data type can also be an issue :RPA works best with structured data and may require additional technologies like AI or OCR

(optical character recognition)to process unstructured datasets. Moreover, organization may implement RPA alongside other connected data sources .the role of RPA is to link and orchestrate them. However RPA solutions, can be limited by the number and types of endpoints to which they can connect. Major RPA platforms such as uipath offer out-of-the-box RPA integration with popular third party enterprises systems like SAP, salesforce ,or amazon web services.

LONG TERM MAINTENANCE AND
MONITORING

It's easy to assume that bots can be left to themselves once deployed .but in reality ,the true work begins only after the RPA implementation is complete .

Any derivation from the pre-programmed sequence can confuse RPA platforms must be adjusted for regulation updates ,changing business requirements ,and new additions to your tech stack.

Even when the systems operates properly ,it will eventually degrade without any modification .the RPA tool will accumulate bugs, or a database can reach its capacity leading to memory overflow.

BUISNESS CHALLENGE

New technologies give rise to new possibilities but also new challenges.RPA implementation is no different and will affect how your business operate. To pave the way for digital transformation ,you must plan for it from a purely technological perspective and consider people and processes.

If you ignore the people relevant to the automated processes ,you will likely face fear or even outright aversion to the new technology .getting executive buy in is crucial and a good place to start ,as senior management can influence company culture and lead by example.

PROCESS IDENTIFICATION AND PRIORITIZATION

Just because a process can be automated does not mean it should be. This is for several reasons.

Firstly ,not all steps in the sequence can be suitable for automation .finding that out halfway through the RPA implementation process can derail that entire initiative or even make it completely pointless .

Then its important to remember that despite its flexibility, RPA isn't suitable for automating all tasks .the technology repetitive, may improve inefficient with highly complex or inconsistent tasks .

IV. FUTURE DIRECTIONS

In a business environment where automation is becoming increasingly essential ,understanding the trajectory of robotic process and automation (RPA) is more important than ever.

The RPA market will grow ,but slowly.

Per Gartner in the 2023 critical capabilities for robotic process automation ,RPA market growth is slowing .

If this trajectory continues for 2024 ,growth will slow even more as RPA enters the next phase of maturity and it,s use become more ubiquitous.

The RPA market will become more competitive

In the Gartner 2023 critical capabilities for robotic process automation ,we find that although growth is slow , the market is not stagnant .in fact ,it's becoming even more competitive as large vendors enter the market and RPA offerings evolve .

RPA will be embedded in other tools rather than sold as a standalone offering .

According to Forrester.R PA vendors are working to expand beyond just RPA. Instead of pushing pure sales, they want to become broad automation suppliers.

This play makes sense for vendors ,but it makes sense from the buying side, too. Taking a platform approach to automation prevents the creation of islands of automation within an organization .in addition ,it means that different automation capabilities integrate seamlessly and that IT means can manage updates and find skillsets for just one platform rather than many platforms -all leading to more operational efficiency.

RPA buyers will have to navigate complex choices.

While the trend of consolidation and broader automation plays ultimately help organization ,it means buyers will have difficult decision to make.

Likely ,buyers in the market for automation technology will need to look for ways to consolidate -while ensuring that all aspects work seamlessly together .

So what's the future of robotic process automation ?inshort, buyers will have to navigate three changes:

RPA bots will become stronger than before as AI models them into more reliable digital workers and IT teams provide them with more solid data foundations .

.growth will continue to slow in the RPA market, but it will also continue to consolidate and become more competitive.

.vendors will make RPA more of a complementary feature rather than the entire focus of their automation offering .

V. CONCLUSION

- RPA is an automated technology based on software tools that could mimic human behavior for repetitive and non-valued added tasks such as typing, copying, pasting , extracting ,merging , and moving data from one system to another.
- The main benefits of RPA are cost reduction, increasing process speed ,error reduction and productivity improvement.
- Across the globe many sectors are already trying to deploy these robotic process and automation technologies including MANUFACTURING INDUSTRY ,CHEMICAL PLANTS, HEALTHCARE sector.

REFERENCES

[1]. Robotic process automation: contemporary themes and challenge :A 2020 paper BYsyed etal.published in comput.Ind.

[2]. Robotic process automation : A scientific and industrial systematic mapping study : A 2020 paper by Enriquez et al. published in IEEE Access.

[3]. Robotic process automation: A paper by van der Aalst et al.publishedin IEEE access.

[4]. Robotic process automation :An overview and comparison to .. A paper describes RPA as an office automation solution that can be used in many departments.

[5]. Robotic process automation (RPA): Industry reference :A resource that describes RPA as a business process automation software that allows users to create their own software robots.

[6]. Robotic process automation: systematic literature review :A paper by Lucija lvancic et al. published in the faculty of economics and business at the university of Zagreb.