JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

HARNESSING THE POWER OF ROBOTICS PROCESS AUTOMATION FOR ENHANCED EFFICIENCY AND INNOVATION

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Abstract: Many software automation techniques have been developed in the last decade to cut down cost, improve customer satisfaction, and reduce errors. Robotic process automation (RPA) has become increasingly popular recently. RPA offers software robots (bots) that can mimic human behavior. Attended robots work in tandem with humans and can 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

Index Terms **- Robotics Process Automation, Bots**

I. INTRODUCTION

Robotic Process Automation (RPA) is the new technology that aims to create software robots (bots) 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 Nonfarm Unit Labour Cost, 2018) enterprises adapt the RPA technology very fast in the past few years. PA has become one of the most trending technologies in many industries. This chapter will introduce the RPA technology and discuss its social implications.

In general, RPA is a system aimed at automating business processes through business logic and user inputs. RPA applications provide tools for users to define robots (or bots) that can mimic their interactions with applications processing a transaction, manipulating data, triggering responses and communicating with other digital systems. (Bolton, 2018) According to a Trecent report automation technology such as RPA are predicted to have a potential economic impact of $6.7 trillion by the year 2025. According to the same report, the automation market will have the second largest economic impact only behind the mobile Internet (Ostdick, 2018) in a recent survey of 500 senior decision makers, 77 percent of respondents believe RPA will drive productivity, through the automation of mundane, transactional tasks.

Rather than being dependent on code as is required for screen scraping, RPA software provides tools for users to build workflows in a visual way that can be entirely independent of coding knowledge. “RPA, a synonym to AI, is the application of technology allowing employees in a company to configure computer software or a ‘robot’ to reason, collect and extract knowledge, recognize patterns, learn and adapt to new situations or environments.” (Laurent, Patrick; Chollet, Thibault; Herzberg, Elsa, 2018) In addition, collaboration between RPA and AI allows for complex capabilities to emerge. While automation mainly aims to restructure and organize rule-based and repetitive processes; defining and handling exception cases are still highly manual tasks. At this point, AI can help the automation software for processes that do not require complex decision-making and analysis, such as natural language processing, (NLP) or online customer support. Future of RPA is seen as the coordination between these technologies. It’s recognized that AI technologies will have a significant impact on our society. What happened in the 19th century with Industrial Revolution, a similar social change is likely to take place in the 21st century with AI.

II. BACKGROUND

Automation is a system that functions without direct human interaction. Many automated systems have the following in common: taking the human factor out and thus improving precision, quality, and accuracy. The first idea of how to automate processes using software came in 1935, when the computer scientist Alan Turing described how a systematical algorithm could work processes more

effectively. His ideas on algorithms and automation had a lasting impact (Middelburg, 2017) In 1965 the first Robotics Institute was opened (Willcocks P. L., 2016), and service automation was the next wave of improvement in automation (Middelburg, 2017).

Case studies for application of RPA include the finance industry (Seasongood, 2016), energy and BPO (Willcocks P. L., 2016). In addition, several studies list the main areas of RPA implementation as accounts payable, accounts receivable, travel and expenses, fixed assets and human resource administration. (Deloitte: The robots are coming, 2015) (Capgemini Consulting: Robotic Process Automation Robots conquer business processes in back offices, 2016). The Capgemini study (Capgemini Consulting: Robotic Process Automation-Robots conquer business processes in back offices, 2016) also revealed that the main measures for RPA success are: cost reduction, increasing process speed, error reduction and increasing compliance. In the last decades, revolutions in technology have led to fear of job loss and alterations of current labor (Author, 2015). Argote and Goodman (1985) address the influence of robotics on individuals and factory companies. These employees perform less significant tasks and experience lesser control, and they also experience a decrease in interaction with others. RPA is generally considered as an uncomplicated form of AI (Anagnoste, 2017). This form of automation is considered revolutionary due to the ease of use, the low price and the fast implementation. There are two main differences between the implementation of RPA and classic business automation (Lacity & Willcocks, 2015a). Firstly, programming of RPA can be learned with a few weeks of training; hence no extensive programming experience is needed.

2.1 Required Skills

A notable aspect of RPA is the ease of developing and modelling processes. RP developers do not require programming skills but should possess knowledge about business processes (Lacity & Willcocks, 2015). They are expected teach the robots the processes they would be automated, instead of programming them. As this job doesn't require the traditional software development skillset, RPA can be managed by the business and operations teams, instead of IT and Engineering. Operational responsibilities include exception handling, testing, system support, process support and product support.

2.2 Process Selection Criteria

The first step of automation should not be automation itself; rather, care should be taken to select suitable processes. To this end, the implementation should begin with questions such as should this process exist in the first place. Process elimination, optimizing and simplifying should be the first steps; this is done to avoid automating redundant tasks and allow focusing on the tasks that benefit most from RPA.

2.3 Scalability

An important aspect of RPA is its scalability. RPA is easy to develop compared to traditional BPM tools, but on top of that, it is more easily scalable. This is crucial for BPO providers, who already in their business are seeking similar strategies in their business processes – the ability to define a process and reuse it for multiple customers (Slaby, 2012). To enable scalability, it must be included in the implementation and development strategy (Willcocks et al., 2015B). To get the maximum out of the robots, they must be multi-skilled (Willcocks et al., 2015A).

2.4 Robotic Process Automation (RPA)

Robotic Process Automation is a technology which aims to reduce human intervention in computer applications, especially in repetitive tasks that vary very little in each iteration. RPA works primarily by interacting with "high level" applications, which are the software layers at the graphic interface level, as oppose to machine language or programming code.

III. BENEFITS OF ROBOTIC PROCESS AUTOMATION

3.1 Improved Customer Satisfaction

Capturing new customers is five times more expensive than retaining current ones. Therefore, all sales strategies should take customer satisfaction into account and leverage intelligent automation to boost satisfaction and increase the retention ratio. For customers to be satisfied, we have to offer them positive experiences at all points of contact with the company before, during and after the purchase of the product or service. Each and every one of these touchpoints are unique opportunities for recruitment, loyalty and recommendation.

3.2 Efficient Management of Digital Processes

In the digital era, it is a race to adapt to the new market needs for organizations that must redefine their work processes to be agile and competitive. According to IDC, in 2023, 35% of workers will start working with bots or other forms of AI, which will require company leaders to redesign operational processes, performance metrics and recruitment strategies. (Murray, 2018) Organizations must have new solutions that help consolidate the "digital business platform". These business platforms must facilitate process visibility and streamline their optimization; in a simple and visual way they must:

- Consolidate the information in business systems.
- Homogenize processes and work methodologies.
- Monitor all digital processes from a single point.
- Facilitate employee access to the processes.
- Automate decision making and help business agility.

3.3 Measuring RPA Success

Perhaps it is the implied simplicity, or its general acceptance in the industry, but ROI (return on investment) is the ubiquitous approach to evaluating success of an investment.

3.4 Holistic View of RPA Benefits

Intrinsically, there are two categories of RPA benefits at a company: primary and secondary. Primary benefits include those that are directly related to the implementation of RPA.

• Increased Accuracy: Any process that requires manual data entry or data transformation introduces the opportunity for error. In a bank, data entry and transcription errors can result in increased rework, decisioning based on inaccurate data, and negative financial impacts and fines.

• Improved Customer Experience: All the primary benefits mentioned above relate to cost savings, but viewed from another angle, these primary benefits enhance the customer experience which can lead to increased revenues as well For example, as employees' capacity increases (through speed, efficiency, redistributed workload), more time can be allocated to customer-facing functions and activities (like improved customer service, increased sales efforts, customer retention activities).

IV. ROBOTIC PROCESS AUTOMATION USE CASES

While there is an unlimited number of use-cases for robotic process automation, certain business process lend themselves to higher ROI by leveraging RPA. Let's take a look at a few scenarios where clients tend to see greatest return on investment.

- Data entry

Data entry is the epitome of monotony. Can you agree? Since RPA has the capability for basic pattern recognition, it can convert nearly all kinds of text into editable and searchable machine encoded text, so the need for manual data entry is reduced. Therefore, fewer errors, faster results, fewer tired and bored employees.

Reconciliation

- Price comparison

Software robots can track varying prices and automatically extract the data for the optimal price setting.

- Payroll

If your company relies heavily on legacy systems, it may not be easy to adopt the latest payroll software. Software robots can be helpful to help automate the process.

- Report generation

Regular reporting is necessary. Software robots can not only automatically summarize the data necessary to create these reports, but they can also be distributed to all stakeholders. It is not difficult at all to see how this relaxes the burden of compliance.

V. RESULT AND DISCUSSION

Used the RPA technology to automate the order placement manual process to reduce cost and improve accuracy and productivity.

5.1 Open the robot order website

Bot will hit the URL on available browser to open the bot order website and maximize the browser to proceed further.
https://robotsparebinindustries.com/#/robot-order

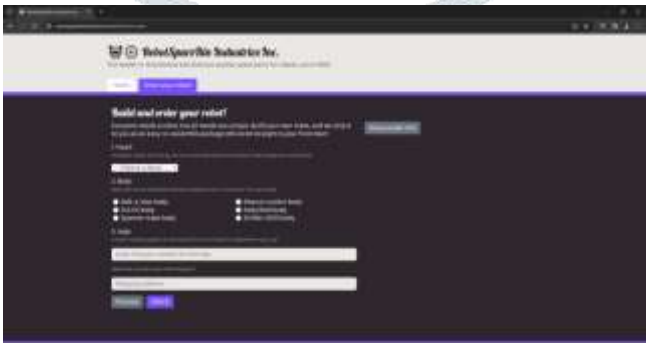

Fig 1. Robot order website

5.2 Get Orders

Bot will download the .csv file in which they are order records by hitting below link.
https://robotsparebinindustries.com/orders.csv

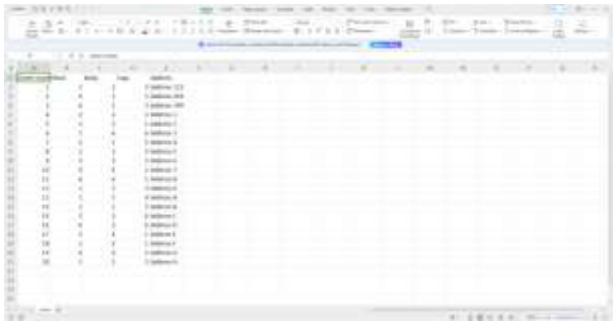

Fig 2. CSV

5.3 Fill the form

Bot will fill the form to order the bot. It will pick the data from csv file and fill the form accordingly.

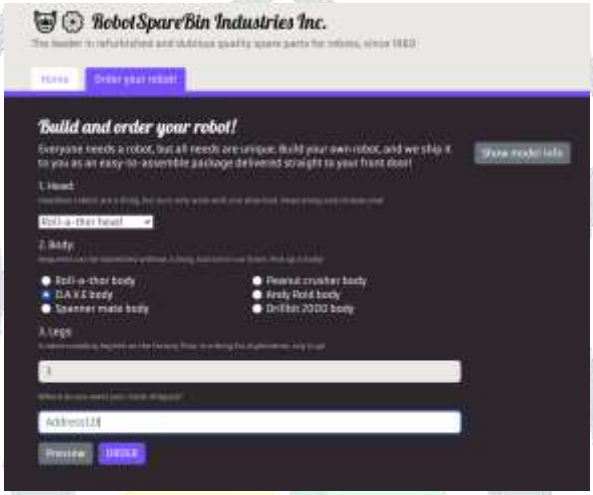

Fig 3.Filled Form

5.4 Store the receipt as PDF file

After filling the form bot will click on “ORDER” button.

The Receipt will appear, Bot will save the receipt as .pdf extension.

Fig 4.Receipt that store as PDF file

5.5 Take a screenshot of the robot

Bot will Take the screenshot of the bot and save as ,png format.

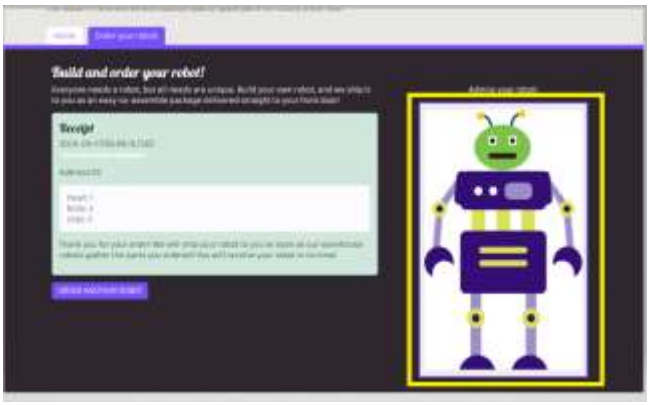

Fig 5.Receipt that store as PDF file

5.6 Embed the robot screenshot to the receipt pdf file

Bot will merge the receipt and the bot screenshot in single pdf file and store in particular path.

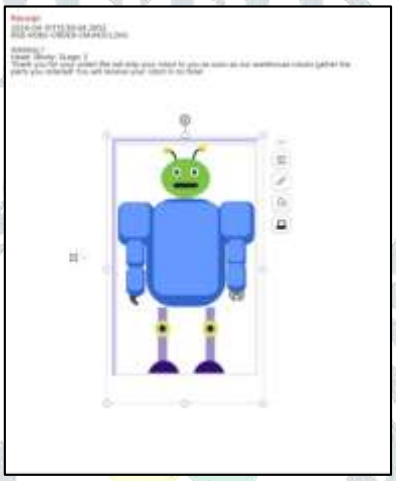

Fig 6.Receipt that store as PDF file

5.7 Create a zip file of receipt pdf Files

In the last step bot will keep all the pdf file in a zip for security purpose.

Fig 7.Receipt that store as PDF file

VI. FUTURE RESEARCH DIRECTIONS

Robotic process automation's workflow efficiency benefits have been of great value to financial services organizations. According to KPMG, banks and other financial organizations that leverage RPA realize 75% cost-savings. (How Robotic Process Automation Shapes Fintech's Future, 2018) Bots can perform repetitive, clerical tasks such as processing customer applications and responding to basic customer queries faster and more accurately than human workers. Bots also behave more predictably than people. They don't deviate from their programming so they won't make mistakes or circumvent processes. Accordingly, RPA is a powerful risk

management resource that many financial institutions already use to monitor compliance and create audit trails. But RPA's contribution to operational efficiency is just the tip of the iceberg. Financial organizations that venture deeper into RPA's capabilities will find a wealth of transformational opportunities that can reshape the customer experience.

VII. ACKNOWLWDGEMENT

The "Robot order placement automation using RPA" project aims to streamline and enhance the order placement process through the development and implementation of intelligent bots. These bots will automate the manual order placement tasks, reducing errors, improving efficiency, and saving valuable human resources for more complex tasks.

No study is without limitations when it comes to the results, and neither is this one. All in all, the research design for this study has been well-constructed, but as with all case studies, they share the aspect that there is only limited generalizability. All the findings and conclusions apply only in the context of this study, and any generalization outside the established setting should be done with caution. If a more comprehensive understanding of RPA projects in different contexts is needed, then further research must be conducted. Another point to keep in mind when interpreting the results from this study is that in its core, the research is centered on forming, analyzing and criticizing a process model. It is possible, that this approach, because of its focused nature, narrows the scope too much, leaving some important aspects completely outside the selection. It could be, that some aspects are therefore completely ignored in the study. The impact of this limitation on projects can be mitigated by being open and attuned to suggestions for improvements in the process flow, essentially treating this established process as a solid template to further build on. As the technology evolves, further studies should be conducted, to keep up-to-date with the state of RPA and how this context could change in the future. However, due to the test case being successful, the introduced process that was extracted from the literature is applicable and exhaustive enough to serve as a basis for the process model. Again, further studies could help in understanding how and why RPA is different and how it has evolved.

VIII. REFERENCES

[1]. Lacity and L. Willcocks, "Robotic Process Automation at Telefónica O2," Strategic Outsourcing: An International Journal, vol. 9, no. 3, pp. 264-288, 2016.

[2]. Sheth, A. Nayak, and K. Chauhan, "Robotic Process Automation: A Review and Future Research Directions," *International Journal of Information Management*, vol. 48, pp. 192-208, 2019.

[3]. L. Loh and C. M. B. Rohde, "Robotic Process Automation in Business Process Management: A Research Agenda," *Business Process Management Journal*, vol. 24, no. 2, pp. 504-522, 2018.

[4]. Sharma and N. Sharma, "Robotic Process Automation: Concepts, Methodologies, Tools, and Challenges," *International Journal of Advanced Computer Science and Applications*, vol. 9, no. 2, pp. 542-550, 2018.

[5] S. Sodhi and M. Soni, "Robotic Process Automation: A Comprehensive Review," *The Journal of High Technology Management Research*, vol. 29, no. 2, p. 99, 2018.

[6] S. Bhatt, K. Bose, and P. Satapathy, "Robotic Process Automation (RPA): A Review and Future Directions," Computers & Electrical Engineering, vol. 77, pp. 381-394, 2019.

[7] *M. S. Er, Y. H. Ong, and Y. T. Ong, "Robotic Process Automation: A Review and Future Directions," in* Proceedings of the International Conference on Industrial Engineering and Operations Management, *pp. 1836-1844, 2018.*

[8] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "Revealing and Classification of Deepfakes Videos Images using a Customize Convolution Neural Network Model", *International Conference on Machine Learning and Data Engineering (ICMLDE)*, 7th & 8th September 2022, 2636-2652, Volume 218, PP. 2636-2652, https://doi.org/10.1016/j.procs.2023.01.237

[9] Usha Kosarkar, Gopal Sakarkar (2023), "Unmasking Deep Fakes: Advancements, Challenges, and Ethical Considerations", *4th International Conference on Electrical and Electronics Engineering (ICEEE)*,19th & 20th August 2023, 978-981-99-8661-3, Volume 1115, PP. 249-262, https://doi.org/10.1007/978-981-99-8661-3_19

[10] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2021), "Deepfakes, a threat to society", *International Journal of Scientific Research in Science and Technology (IJSRST)*, 13th October 2021, 2395-602X, Volume 9, Issue 6, PP. 1132-1140, https://ijsrst.com/IJSRST219682

[11] Usha Kosarkar, Gopal Sakarkar (2024), "Design an efficient VARMA LSTM GRU model for identification of deep-fake images via dynamic window-based spatio-temporal analysis", *International Journal of Multimedia Tools and Applications, 8th May 2024, https://doi.org/10.1007/s11042-024-19220-w*