Development of PrimeBot as an Assistant to HR in Recruitment Process using RPA

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Abstract – **The current scenario around us is highly automated. Many industries around us use ERP, core banking and many systems has been released to carter their business. Each of these industries around us requires a lot of human resources to handle these systems. Whenever there is human intervention, chances of errors are high. End customer faces some or the other problem and hence they are not satisfied. Therefore to serve the customers in a faster, consistent way and to help increase the potential of the personnel in key areas of business, a technology called RPA (Robotic Process Automation) is released. Our project is aimed at understanding the uniqueness and merits of the Robotic Process Automation system and its impact on working of backhand operations of Multinational Companies.**

Robotic Process Automation is the use of software with Artificial intelligence and Machine Learning capabilities to handle high volume, repeatable tasks that previously require humans to perform. Today Quality Assurance is receiving significant attention owing to the demand for new releases, product offerings and service excellence. To accelerate time-to-market and ensure good quality output, organizations need more than just agile delivery; hence we implementing the Prime Bot to help HR in recruitment process and will help organizations benefit from shorter turnaround time, higher efficiency and better accuracy.

Keywords – Machine Learning, Robotic Process Automation, PrimeBot, Robot.

I. INTRODUCTION

The present generation of information depends on data. The data like digital bits, any organization targeting any specific field has tons of data to manage. The human hands are limited to process all of them. Hence, machine learning teaches machine how to perform their work and get work done. Machine Learning is a core part of the technology called Artificial Intelligence in which we can program the devices to work by themselves on input data without need of programmer. Robotic Process Automation is a use of software with Artificial Intelligence and Machine Learning capabilities to handle high volume, repeatable task that previously required humans to perform. Machine Learning is a field which is raised out of Artificial Intelligence (AI).

Our industry has seen many waves of the changing technologies in the last three decades. All of these technologies have touched the core of businesses and hence automated business process at every stage across enterprises. In the 90's, it was the Enterprise Resource Planning wave that automated many process at every stage across many industries. This was the technology that most companies undertook and surely goes a long way to prove that ERP has added tremendous value to these companies, so much that they have continued to stay with it. ERP succeeded in ensuring standardization and scalability. It also helped reduce errors, improved compliance, and faster turnaround time.

The ERP wave was followed by the wave of "Leveraging the Cost Arbitrage" in 2000's. Significant business processes that companies considered the core of their existence were outsourced. As a result, BPO's spread all around, providing similar or better level of services at much lower cost. Due to the imbalance in Demand and Supply, the cost of off shoring increased (the rate of growth in demand was far higher than the supply). During the same period, markets across the globe were getting commoditized and were therefore under tremendous pressure for margins. It was during this time that a need was felt for the next wave was felt more than ever before.

The new century introduced the web enablement, leveraging thin clients that helped enterprises adopt self-service. RPA is the next new technology that assured increased productivity, less error and cycle time and improved scalability. In RPA we are having a shift of knowledge from humans to digital world where knowledge is transferred by humans.

The main aim of our project is to develop a software robot which will help the companies in their recruitment process using RPA technology. Robotic process automation (RPA) is an emerging trend form of business process automation technology based on the basis of software robots or artificial intelligence (AI) workers. Using this technology, we are going to develop a software robot which will carry out the recruitment process automatically with the help of the criteria provided by the companies.

Robotic Process Automation technology itself is an innovative concept. Cost reduction, speed of delivery, accuracy, efficiency, improved audit and greater transparency are few of the major benefits of RPA. Software robots cost less due to RPA. A process that would normally take half an hour could take less than 10 minutes if automated by RPA. Robotic Process Automation can be achieved by RPA tools. These tools are the software through which we can configure tasks to get automated.

II. MACHINE LEARNING

Machine Learning is an application of Artificial Intelligence that provides systems the ability to automatically learn and

improve from experience without being manually programmed. Machine Learning focuses on the development of computer programs that can access data and use it learn for themselves. For example, pattern matching algorithm for our project.

The process of learning begins with observations, or data, such as examples, direct experience, or instruction, in order to look for keywords in patterns and make better decisions in future. The primary aim is to allow the computers learn automatically without any human interaction or assistance and adjust actions accordingly.

Machine Learning is implemented where it is not possible to develop an algorithm of specific instructions for performing the task. Machine learning is related to the statistics, which focuses on making predictions using computers. The Machine Learning algorithms are supervised machine learning algorithm, unsupervised machine learning algorithm, semi-supervised machine learning algorithm and reinforcement machine learning algorithm.

III. ROBOTIC PROCESS AUTOMATION

The process of automating business operations with the help of robots to reduce human interference is said to be Robotic Process Automation. ROBOTIC are system that mimic human actions called as robots. A PROCESS is a sequence of steps that will lead to a meaningful output. AUTOMATION is any process which is done by a robot without any human interaction or assistance.

Robotic Process Automation can be achieved by RPA tools. These tools are the software through which we can configure tasks to get automated. RPA tools like Blue Prism, Automation Anywhere, UiPath, WorkFusion, Pega Systems and many more. We are using UiPath that has free edition available, provides the user-friendly visual designer and is a popular tool.

Multinational companies such as Deloitte, Accenture, Capgemini and many more use Robotic Process Automation. These companies, benefit by using RPA as it provides accurate, reliable, consistent outputs with high productivity rates.
. RPA is the next new technology that assured increased productivity, less error and cycle time and improved scalability. In RPA we are having a shift of knowledge from humans to digital world where knowledge is transferred by humans.
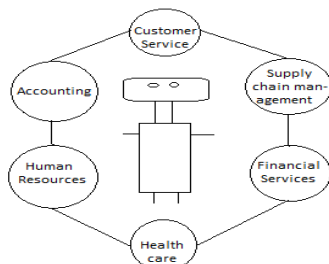
IV. EXISTING SYSTEM

The current system can be accessed by HR recruiter who will specify the job details. The requirements are mailed in the form of an email to the PrimeBot that is the software robot. The robot will download the email and will review the job details specified by HR recruiter and will post them on job portal.

The candidates who are looking for job have their resumes uploaded in various sites. The robot will record the candidate details and their resumes. He will rank them according to the requirement and the selection based on the job details mailed by HR recruiter will be done. A notification email is sent to the candidate about his/her selection and the candidates will be responding accordingly. The robot will then schedule their details and save all the shortlisted resume in zip file. The robot will finally mail zip folder to the HR recruiter.

V. PROPOSED SYSTEM

The proposed system can be accessed by HR recruiter who will specify the job details. The requirements are mailed in the form of an email to the PrimeBot that is the software robot. The robot will download the email and will download the job details specified by HR recruiter. The robot will then save it in a new folder.

The HR recruiter's standard job description can be C++/sql that will act as keyword for our robot. The robot will go through different resumes and will search for keywords. If the keyword is found in Resume1 then their ranking is done with the help of percentage and the percentage is calculated with the help of keyword.

The robot will parse the resume irrespective of resume's format (pdf, doc, txt) and the resume ranking is done. The output generated for the same will be a csv. We then move file from one folder to final folder on the basis of percentage criteria. After this stage, we receive the final folder with output in csv format which will be then mailed to the HR recruiter.
The main objective of our project is to create successfully functional software (PrimeBot) using RPA. To ease the process of recruitment for HR in companies. To minimize efforts , cost and time required for the tedious process of recruitment.

Mathematical Model :

Solution perspective for proposed scheme,

S = { s, e, X, Y, Fme, DD }

s - Initial State: { Job Description is given as input }

e - End state : { Message will be conveyed to candidate by mail or chat based on ranking and their response will be conveyed to HR }

X – Input : { Job Specification, Candidate resume dataset }

Y-Output : { Response from shortlisted candidate will be conveyed to HR(Recruiter) }

Fme – Functions/Algorithm: PrimeBot takes resume as input from job sites (naukri.com, monster) and ranks resumes

according to job description given by HR and based on that candidate will be ranked and mail will be sent by PrimeBot and response from that candidate will be conveyed to HR.

DD – **Deterministic** Data: {Resumes}
Algorithm :

SVM-Rank is a technique to order lists of items. It uses standard SVM for ranking task.Lets suppose,we have a classifier(SVM) and we have two items, item1 and item2.Item1 is expected to be ordered before item2. Then, Input to the classifier: (item1, item2)Output of the classifier: 1 [which implies ordering of item is correct i.e. item1 is better than item2]Input of the classifier : (item2, item1)Output of the classifier : -1 [which implies ordering of item is incorrect]

Lets say the preffered oder of three items is (item1,item2,item3) Classify the pair of items using the trained classifier
(item1, item2) = 1 , (item1, item3) = 1 => score of item1 = 1 + 1 = 2
(item2, item1) = -1 , (item2, item3) = 1 => score of item2 = -1 + 1 = 0
(item3, item1) = -1 , (item3, item2) = -1 => score of item3 = -1 - 1 = -2

Based on the score we get rank: item1, item2 , item3

The same process can be repeated for any number of items.

Initial step of optimisation problem is formulated as ordinal regression; however, using pair wise difference the regression problem is converted into classification problem.

SVM-Rank used pairwise difference vectors to produce rank list of items.

So, given a list of items represented as feature vector, if we want to order them then SVM-Rank is right things to use.

VI. UPSIDES OF RPA

1. Detailed process analysis and maximum automation coverage.

2. Substantial reduction in TAT engaged in each process.

3. Improved consistency accuracy & key solutions provided at sub process level reducing cycle time.

4. Substantial improvement in SLA performance, volume as well as exception handling.

VII. CONCLUSION

Automation is a part every organizations and we have here successfully implemented the PrimeBot as an assistant to HR for recruitment purpose that will increase accuracy and decrease human resources and thus providing us with the output in a very less amount of time.

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