

Robotic Process Automation in Social Innovation for Education System

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Abstract: Future of organizational process is robotic process Automation. Various domains like IT, Finance and accounting, Supply chain and so on uses Robotic process automation as a solution. In this paper we propose a RPA solution for education domain. This paper shows the robotic automation process for result analysis of student’s examination results. The input of the automation process is given as the university result in pdf form. We use RPA tool for performing automation on this input file. Our result shows that all the work is error free. Also time required for this analysis is around 94.44% less as compared to manual analysis by human.

Keywords: RPA, Automation, BOT, Automation Anywhere.

1. Introduction

In this 21st century, organizations compete among themselves which forces them to change some of the faster methods to showcase and market their products and services. Meanwhile they keep their expenses under control, they need to increase their revenue. To achieve the above circumstance, Automation is used as the key factor. Nowadays every organization are concentrating more on automation process [2]. Robotic Process Automation is mainly comprised of two parts, 1) Hard Automation, 2) Soft Automation. Machines or robots that perform task which is specific or fixed but required repetitive steps is known as hard automation. Whereas advanced version of hard automation which allows different tasks to performed as per requirement is known as soft automation. Robotic Process Automation (RPA) comes under soft automation [6]. Blue prism, the most popularized organization invented the term Robotic Process Automation (RPA). The term RPA is accepted by many of the software providers by the mid of 201 and now there are more than 51 automation tools are available in the globe. Each tool is different in its dimensions and it usage [9]. According to Institute for Robotic Process Automation (IRPA), RPA is the application that consist of technology. Using this technology, employees of any organization can configure a robot with software, manipulate data, can make to and fro communication with any other organizations. [12]. All the digital environments uses RPA technology. In organizations, humans perform

specific repeated digital tasks. Those repeated tasks can be automated or human action can be copied by using Robotic Process Automation technology [1]. Automation can be done to the manual processes that are done by human workers with the help of RPA technology which has several tools. That RPA software BOT is programmed to perform multiple steps such as write data, read data, relevant can be data and perform numerical calculations on data and so on [6]. According to Santiago et al [7], RPA is a kind of software or a tool that provides solutions to processes which is mainly based on set of rules, that also includes repetitive tasks, structured data and semi structured data. It reduces many of the repetitive task like copying data from one data base to other, extracting data transferring data and so on [7].

Benefits of RPA is tabulated as follows [2],

Table 1
Benefits of RPA

Parameter	Increase ↑ / Decrease ↓
Cost	↓
Accuracy	↑
Execution Time	↓
Security	↑
Confidentiality	↑



Fig 1. Areas for RPA implementation

In order to complete the tasks of various industries in a minimal amount of time Robotic Process Automation is used. Some of the industries where RPA is used as follows, commercial industries for back office tasks completion, IT industries for remote management tasks, etc. [6].

In paper [12], detailed areas where RPA can be applied is mentioned in detail. Below fig.1 from [12] shows areas for RPA.

Even though RPA is considered as effective technology in various domains, there is some risk associated with it. In paper [3], some of the risks are as follows,

If any minor error in logic is found, then RPA can make mistakes faster and with certainty,

- There may be no human to check the status while automating tasks.
- RPA vendors say that their tools are straight forward and it requires no expert for implementation and it is fully efficient.

The processes that can be automated are listed below. The Processes having features as such as rule based, manual repetitive, time consuming, structured data, transactional data and high volume data can be automated [4].

2. Related work

New method for identifying process that can be automated was proposed by Audrey Bourgooin et. al. [8]. This method is more applicable to automate processes from different business domains. In order to use the process the end user need not to be an expert in RPA. The process is classified into some categories such as Not Suitable for RPA, less Suitable for RPA, moderately suitable for RPA and Highly Suitable for RPA. Their approach is listed as four step processes:

- 1) Based on level of maturity and standardization, Validation of process for RPA.
- 2) Evaluation potential of RPA process.
- 3) Evaluation of RPA relevance
- 4) RPA Classification of process

Application of RPA is proved to be successful by SsuChieh Lin et. al. [10]. Operator can be replaced and the ambition of unmanned factory can be achieved according to the experts.

Wil M. P. van der Aalst et al [11], says that in order to interact with two different types of information systems RPA can be used as if they were human. Some of the research questions mentioned are as follow:

1. What are the suitable characteristics make processes to be supported by RPA?
2. How to make RPA agents learn things?
3. How to avoid security, compliance and economic risks and control RPA agents?

They conducted a case study with a BPO provider in order to observe and verify benefits and results of RPA. Productivity is the main advantage of RPA according to them but time reduction is not achieved in this case.

In paper [1], M. Ratia et al showed that due to use of RPA

technologies in human labor work in daily business work I reduced, Health care industry, scalability is improved, quality of the work is enhanced, productivity, costs are reduced. Overall efficiency of the organization is enhanced.

If your process is not repetitive or routine, then there is no use of RPA there. If human resource is available at lowest price then in that case RPA don't make any sense [1].

A. Different RPA Providers

RPA tools are software programs that operates on the user interface of other computer systems and acts as if humans were working [3].

Forrester Wave 2017 report [5] says that the best RPA vendors are: Blue prism, UiPath and Automation anywhere anywhere.

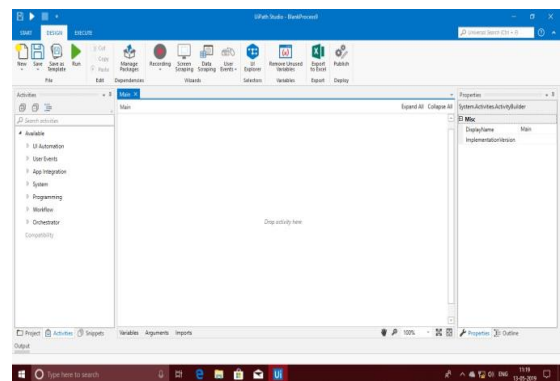


Fig. 2. GUI of UiPath Community Edition

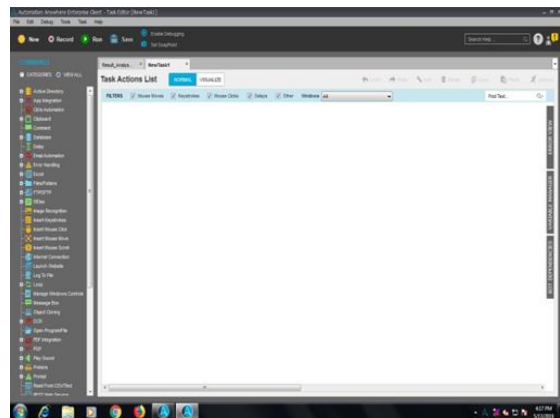


Fig. 3. GUI of Automation Anywhere Client [13]

B. Existing approach

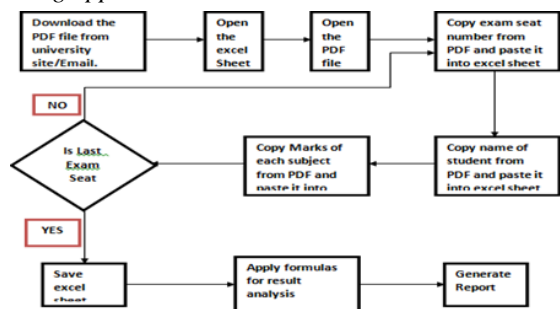


Fig. 4. Flowchart for manual approach

C. Proposed approach

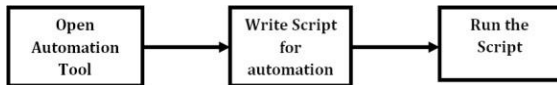


Fig. 5. Flowchart for proposed approach using automation tool

In this paper we have proposed the new approach for analyzing the result using the above RPA automation tools. The logic is returned for the above mentioned process. Although script writing consumes more time, it can be reused every time when the result is declared.

3. Implementation

The performance of a BOT implementation for analysing the result of the process is shown in this paper. The result PDF copy from Savitribai Phule Pune University is used as the sample input for this process. Copy of the result is as shown in Fig 6. There are around 650 pages for this result PDF. Extracting the data manually is consuming more time and its prone to error.

This task has been automated using Automation Anywhere Tool. This task has been perfectly automated using this tool as it includes features mentioned in [4] i.e. structured data, high volume of data, manual repetitive and time consuming, rule based tasks.

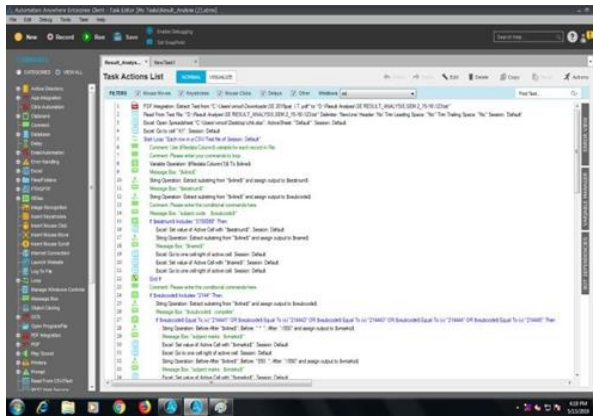


Fig. 6. Bot created in automation anywhere

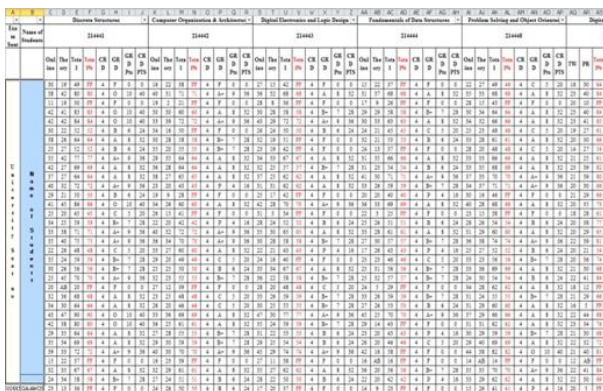


Fig. 7. Result Entries in Excel by BOT

All the entries from PDF to excel are done automatically without human intervention after successful execution of the

process or task. Finally, from those excel entries proper analysis is done for each subject.

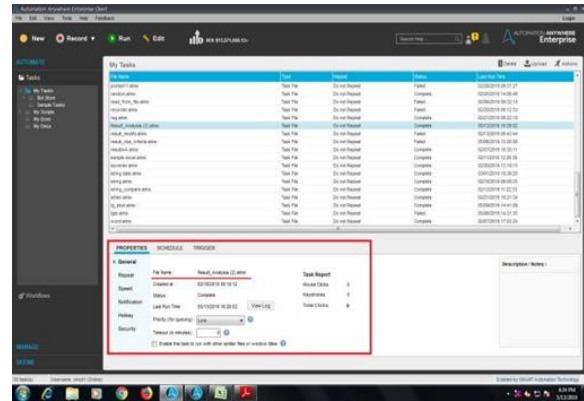


Fig. 8. Properties of BOT created

The BOT which we have created works without any human intervention i.e., mouse or keyboard click. In BOT properties, it shows clearly that the task report in which total clicks mentioned is "0". The robot can be scheduled to be run on specified time or date. It can be executed based on triggering.

Log file that includes the information of task name, status, last run and task name is created after the successful execution of the robot after the successful execution of BOT. It lists out the error details if occurs.

4. Experimental results

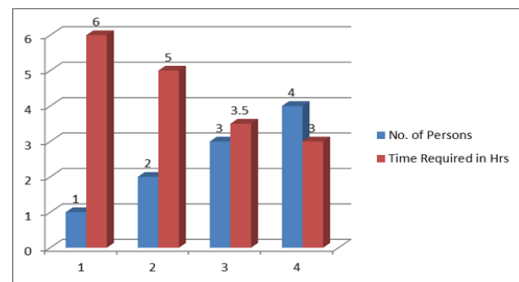


Fig. 9. Graph for Number of Persons vs. Time required

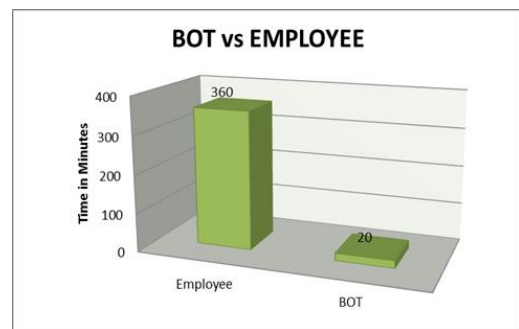


Fig. 10. Graph for BOT vs. Employee

The graph shown gives the experimental results of the manual approach. By the graph we can conclude when the number of employees is increased the time required is decreased. It shows as the number of employees increased the

time required is reduced. The average time required is 3 hours.

This graph in Fig. 10 displays the comparison of time taken by single employee and the robot. We can understand clearly that the time required by the robot to complete the process is 94% less when compared to the human.

5. Conclusion

Successful implementation of RPA for result analysis of university results in the academics is done in this paper. This automation process will help many other organizations to utilize less manual work for those process that can be automated. Thus time can be saved with error free analysis.

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