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Tudor Popescu

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*Performance Analysis of RPA Technologies*

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# 1.CLASSIFICATION

Author: Tudor Popescu

Subject: Performance Analysis of RPA Technologies

Classifications:

1.1 AMS(2020):68U04

1.2 ACM(1998):H.4.1

keywords: automation, performance, UIPATH, POWERAUTOMATE

# 2.ABSTRACT

This article is for people that want to start working in the Robotic Process Automation domain and are not yet sure what is the best app to start learning on between the two. In this article I will explain the difference between speed and accuracy of the two when it comes to data scraping on the web and saving data to an excel file. In my experience, the two stated before are one of the most used (if not the most) activities when it comes to RPA.

# 3.RELATED WORK

**3.1 The Critical Success Factors for Robotic Process Automation**

**(**[**https://www.sciencedirect.com/science/article/abs/pii/S0166361522000434**](https://www.sciencedirect.com/science/article/abs/pii/S0166361522000434)**)**

Authors and context:

- **Ralf Plattfaut**: Conceptualization, Methodology, Validation, Resources, Writing – original draft, Writing – review & editing, Supervision, Project administration.

- **Vincent Borghoff**: Methodology, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization. Marie Godefroid: Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization.

- **Julian Koch**: Investigation, Data curation, Writing – original draft.

Outline:

- Introduction

- Robotic Process Automation

- Research approach

- Development structures

- Discussion

- Conclusion

*RPA is a new concept and there are still gaps in understanding the exact factors that determine success or failure.This article helped me the correct approach in trying to understand the deciding factors.*

**3.2 Research on Cost Management Optimization of Financial Sharing Center Based on RPA**

**(**[**https://www.sciencedirect.com/science/article/pii/S1877050920301538**](https://www.sciencedirect.com/science/article/pii/S1877050920301538)**)**

Authors and context:

**Yu Lian Qiu , Guo Fang Xiao\***

School of Management, Wuhan University of Science and Technology, Wuhan, China

Outline:

- Introduction

- Analysis of the Status Quo and Problems of Cost Management in FSSC

- Cost Management Optimization of FSSC Based on RPA

- Conclusion

*This article showed how to optimize the management costs using an example ( A GROUP)*

**3.3 Robotic Process Automation: Contemporary themes and challenges**

**(**[**https://www.sciencedirect.com/science/article/abs/pii/S0166361519304609**](https://www.sciencedirect.com/science/article/abs/pii/S0166361519304609)**)**

Authors and context:

**Rehan Syed, Suriadi Suriadi, Michael Adams, Wasana Bandara, Sander J.J. Leemans, Chun Ouyang, Arthur H.M. ter Hofstede, Moe Thandar Wynna**

Queensland University of Technology, Australia

**Hajo A. Reijersb, Ingevan de Weerdb**

Utrecht University, The Netherlands

Outline:

- Abstract

- Introduction

- Approach

- Key findings

- Robotic Process Automation – research themes and challenges

- Conclusion

*This article had a brief description of RPA and also made me understand that organisations seek advice from vendors and consulty organisations in order to understand the selection, preparation and implementation of RPA.*

**3.4 Applications of Robotic Process Automation in Smart Governance to Empower COVID-19 Prevention**

**(**[**https://www.sciencedirect.com/science/article/pii/S1877050922005774**](https://www.sciencedirect.com/science/article/pii/S1877050922005774)**)**

Authors and context:

**Shigou Wang, Qiurui Sun, Ying Shen, Xin Li**

Outline:

- Introduction

- Key technologies and infrastructures of RPA

- Applications and merits

- Challenges for the next generation RPA

- Acknowledgements

*This article talks about how RPA has been implemented into financial services (combined with AI technologies) and states that in the future the work will be mainly done by robots and it will be hard to see the difference between an inteligent human and a robot*

**3.5 Minimizing the number of robots required for a Robotic Process Automation (RPA) problem**

**(**[**https://www.sciencedirect.com/science/article/pii/S1877050921017762**](https://www.sciencedirect.com/science/article/pii/S1877050921017762)**)**

Authors and context:

**Sara Seguin, Hugo Tremblaya, Imene Benkala, David-Emmanuel, Perron-Chouinarda**

**, Xavier Lebeu**

Outline:

- Introduction

- Problem Description

- Heuristics to compute the upper bound

- Experimental results

- Conclusion

*This article shows a way to solve an RPA problem, giving a better understanding of the steps we need to make in order to optimize the solution.*

# 4.INTRODUCTION

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**4.1 RPA SHORT INTRODUCTION**

Robotic Process Automation (RPA) has become an increasingly popular technology in recent years, as organizations look for ways to automate repetitive, high-volume tasks and improve their efficiency. Two of the most popular RPA tools on the market today are UiPath and Power Automate.

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**4.2 UIPATH SHORT INTRODUCTION**

UiPath is a leading RPA platform that enables organizations to automate a wide range of business processes, from simple tasks like data entry and document management, to more complex processes such as financial reporting and compliance. One of the key features of UiPath is its intuitive, drag-and-drop interface, which makes it easy for users to create and manage automations without the need for coding skills.

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**4.3 POWER AUTOMATE SHORT INTRODUCTION**

Power Automate, on the other hand, is a cloud-based RPA platform that allows users to automate workflows across a wide range of services, including Office 365, Dynamics 365, and LinkedIn. Power Automate is designed to be easy to use, with a library of pre-built connectors that make it simple to integrate with other systems and services.

# 5.MAIN DIFFERENCES

UiPath and Microsoft Power Automate (formerly known as Microsoft Flow) are both automation tools, but they have different use cases and functionality.

UiPath is a Robotic Process Automation (RPA) tool, which means it is designed to automate repetitive, rule-based tasks typically performed by humans. UiPath has features such as the ability to automate tasks across multiple applications and systems, optical character recognition (OCR), and the ability to automate tasks on remote machines.

Power Automate is a workflow automation tool that allows users to automate business processes and integrate with other systems. It can be used to automate tasks and create custom workflows, but it is not as robust as UiPath when it comes to automating complex, multi-step tasks across different applications and systems. Power Automate can integrate with various Microsoft and third-party services, like SharePoint, Dynamics 365, Outlook, and more.

In summary, UiPath is geared towards automating complex and specific business tasks, while Power Automate is more for creating workflows and integrations across different apps and services.

# 6.MATERIAL AND METHODS

**6.1 Data**

The data we used for this experiment were the first 100 links that pop up in the video section when searching “UiPath Academy” on Google.com as well as their upload date.

Here are some of them:

|  |  |
| --- | --- |
| UiPath Academy | Get empowered, grow your skills, and ... | 1 aug. 2019 |
| UiPath Essesntial Training - 4 3 Selectors | 10 apr. 2017 |
| RPA Tutorial For Beginners | UiPath Training Online - YouTube | 10 oct. 2017 |
| UiPath Academy Live - mastering the RPA essentials - YouTube | 10 oct. 2018 |
| RPA Training Academy - Morpheus Group | 10 sept. 2020 |
| RPA Training Academy - Copy incl video feedback - Morpheus | 11 iun. 2020 |
| See RPA Developer Kickstarter | Day 1 - UiPath Community | 11 mai 2022 |
| UiPath Academy - What Next | Coursera | 12 iul. 2022 |
| UiPath Academy - What Next | Coursera | 12 iul. 2022 |
| UiPath Academy - What Next | Coursera | 12 iul. 2022 |
| Video Demo - Working with Lists || UiPath Academy - YouTube | 13 apr. 2020 |
| RPA Day Bucharest Romania - Aggranda | 13 aug. 2019 |
| UiPath DevCon 2019: Academy and Community - YouTube | 13 feb. 2019 |
| Reskilling with UiPath Academy: Jay Armand Ogayon - YouTube | 17 iul. 2020 |
| UiPath on Mac - RPA Developer Tutorial | 17 mai 2019 |
| How RPA Developers Are Automating Their Personal Lives | 17 mai 2019 |
| Digital Lead: Alexandru Mihailciuc, VP UiPath: avem mai mult ... | 17 mai 2022 |
| Articulating Automation! - UiPath Community | 18 feb. 2022 |
| Automation using UiPath - Xaltius Academy | 18 feb. 2022 |

**6.2 Steps I took**

The first step I took was learning UiPath. I started with learning for 1 month and getting a certification by passing the UiPath RPA Associate Exam. After that, learning how to work in Power Automate was easy since they are alike.

The second step was implementing the code in UiPath to access the desired web page, gathering the desired data and saving it in an Excel file.

The third step was the same as the second, but in Power Automate. I tried my best to access the web page and gather the data in the same way as I did with UiPath so the result would be valid.

The forth and last step was running the code multiple time for each application, so we would get a more precise answer.

# 7.EXPERIMENTS

**7.1 DATA SCRAPING**

In a recent performance test, we found that UiPath was faster than Power Automate when it came to performing a specific task of web scraping and data extraction. Also, the extraction was more accurately when it came to UIPath. The task consisted of: Opening the Edge Browser, accessing Google.com, type "UiPath Academy" into the google search bar, then select the video section and extract the title and the time of the publication of the first 100 links then save the data in an Excel. In both cases, the selectors were done by the app itself, this way we also could see the difference between automatic selectors from UiPath and Power Automate. I would like to mention that in both cases I helped the identifier to find all occurrences of a title and its publication date for the first google page (out of 10, since the first 100 elements are found on the first 10 pages). The test was conducted using both software on the same machine, and the results showed that UiPath was able to complete the task in 21 seconds (every run was exactly 21 seconds) while the time it took Power Automate to complete the task was 40.2 seconds on average (the time differed between each run with a minimum of 1 second and a maximum of 6 seconds). Also, the two Excel files did not look the same. They both had 100 rows since that was the limit I set, but the excel from UiPath did not have duplicates, and all the entries had the the title in the first cell and the date in the second as they should. In the excel from Power Automate we saw some duplicates on the same row, sometimes the first 2 cells were empty and the 3rd and 4th were holding the information, sometimes all 4 of them and so on. The information was way more chaotic and I think this is mainly the selector's fault.

**7.2 POSSIBLE REASONS FOR THE OUTCOME**

One possible reason for this difference in performance is that UiPath has a more robust set of built-in web scraping capabilities. Its web scraping feature allows for more granular control over the data extraction process, making it possible to extract specific data elements with a high degree of accuracy. In contrast, Power Automate's web scraping capabilities are more limited and may not be as effective when it comes to extracting specific data elements.

Another reason for the performance difference is that Power Automate could require more resources to complete the task, which may result in longer processing times. Power automate is a cloud-based solution, therefore it may be affected by the internet connection speed, which should also be a factor to take into account.

It's important to note that this test was performed on a specific task and specific versions of the software (latest current version for both), so it does not necessarily reflect the performance of UiPath and Power Automate in general. Additionally, as RPA is a rapidly changing field and both software are in a continuous improvement, the results may be subject to change in the future.

# **8.CONCLUSION**

In conclusion, while both UiPath and Power Automate are powerful RPA tools with their own unique features and capabilities, the performance of these tools can vary depending on the specific task and the environment. In my specific test case, UiPath was found to be faster than Power Automate when it came to the task of web scraping and data extraction. However, organizations should carefully evaluate the specific needs of their RPA projects and consider factors such as ease of use, scalability, and cost before making a decision.

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