Case Study

Indexing Robotic Process Automation Products

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Abstract - The article addresses organizations' challenges in selecting the most suitable Robotic Process Automation (RPA) product from many available options. To overcome the subjective biases that often mar the selection process, the article proposes a scientific method for indexing RPA products. This methodology is based on establishing clear evaluation criteria, such as functionality, performance, scalability, and user-friendliness. A rating scale is created for objective comparison and rigorous data collection from various sources. The data is then analyzed quantitatively, employing weighted analysis to account for the varying importance of different criteria. Organizations can make data-driven decisions by calculating an overall index score for each product. Moreover, the utility of a Proof of Concept (POC) in the final selection phase is highlighted, allowing businesses to test the applicability of shortlisted RPA tools in real-world scenarios. In conclusion, the article advocates for a systematic and scientific approach to RPA product selection, ensuring businesses can align their automation initiatives with products that best fit their unique requirements and objectives.

Keywords - Comparison of robotic process automation offering, Evaluation of robotic process automation, Open-source robotic process automation, Product selection approach, Robotic process automation.

1. Introduction

The rapid advancement of technology has given rise to numerous Robotic Process Automation (RPA) [1] products in the market, allowing businesses to streamline their operations and boost efficiency. However, with the abundance of choices, selecting the most suitable RPA solution can take time and effort. To make an informed decision, employing a systematic and scientific approach to index and compare RPA products based on objective criteria is crucial.

Indexing RPA products using scientific methods provides organizations with a structured framework [2] to evaluate and compare solutions. This approach allows businesses to consider specific factors crucial to their automation needs, such as functionality, performance, scalability, security, ease of use, and support. By employing scientific methods, businesses can minimize subjective bias and make data-driven decisions when choosing an RPA product.

This article uses scientific methods to explore the methodology and steps of indexing RPA products. We will delve into the essential criteria to consider, creating a rating scale, data collection and analysis, weighted analysis, and calculating index scores. By following these steps, businesses can understand the strengths and weaknesses of various RPA products and identify the best fit for their organization's unique requirements.

By adopting a scientific approach to index RPA products, organizations can align their automation goals with specific evaluation criteria, allowing for an objective and comparative analysis of different solutions. This method facilitates effective decision-making and provides a solid foundation for future scalability, sustainability, and success in the automation journey.

In the following sections, we will delve into the methodology for indexing RPA products using scientific methods, emphasizing the importance of objective evaluation and its benefits to organizations seeking to optimize their processes through automation.

As RPA is less than a decade-old solution, all studies in the past were done on proprietary software only [12]. No major open-source solutions were available until 2019 for propriety software like automation Anywhere. Robocorp, OpenRPA Tag UI, and other open-source RPA offer customers and individuals the opportunity to contribute and add features for which they must wait months to implement the solution.

2. Methodology
2.1. Define Evaluation Criteria
To begin indexing RPA products [3], defining a set of evaluation criteria that align with the organization's specific needs is essential. This can include factors such as price, infrastructure requirements, security, compliance, ease of use, intelligent automation technology, out-of-the-box

solutions, sustainability, developer community, marketplace solutions, implementation time, customer size, quality of support, visual editors, ease of setup and administration, queue management, password management, ease of integration with other applications, OS support, Okta/SSO integration, developer community size, and additional factors that are important for the organization's requirements.

2.2. Create a Rating Scale

Establishing a rating scale is essential for the objective comparison of RPA products. The scale can be numerical, such as a 1-10 rating, or descriptive, using categories like "poor," "fair," "good," and "excellent." Assign scores to each evaluation criterion based on their relative importance to the organization.

2.3. Data Collection

Gather data from various sources, including official product documentation, user reviews, case studies, and vendor demonstrations. Ensure that the information collected is current and accurate.

2.4. Selection Candidates

Before we move forward, let us find the candidates for selection. Gartner [4], HFS [5], and Everest group [6] perform intensive research on top and upcoming automation products, which provides a great starting point. Automation Anywhere [7], UiPath [8], and Blue Prism [9] are in the top 3, Powerautomate [10] in the challenger, and Robocorp [11] in the upcoming category.

2.5. Data Analysis

Quantify the data obtained in step 3 by mapping it to the predefined evaluation criteria and rating scale. This process will provide a structured and consistent comparison framework [12]. Here is a breakdown of the data analysis process:

2.5.1. Collect Relevant Data

Gather data from various sources, such as official product documentation, vendor websites, customer reviews, industry reports, and expert opinions. Ensure that the data collected is accurate, up-to-date, and comprehensive. For example, the data in the above table can be cross-verified from the official sources.

2.5.2. Assign Scores or Ratings

Once you have the necessary data, assign scores or ratings to each RPA product for each criterion. This can be done based on the information available or by using a scale (e.g., numerical scale, rating scale) to quantify the performance of each product. For example, you may assign scores from 1 to 5, with one being the lowest and five being the highest, to evaluate each product's functionality, security, ease of use, etc.

2.5.3. Normalize the Scores

In cases where different criteria have different scales or ranges, it is essential to normalize the scores. This ensures that each bar contributes proportionally to the overall index score. Normalization can be done by converting scores to a standard scale or using statistical techniques such as z-scores or min-max scaling.

2.5.4. Weighted Analysis

Apply the weights assigned to each criterion during the evaluation framework [13]. Multiply the scores of each bar by its respective weight to give more importance to the requirements deemed more critical to your organization's needs and priorities.

2.5.5. Calculate Index Scores

Sum up the weighted scores [13] for each RPA product to obtain an overall index score. This score represents the product's overall performance based on the evaluation criteria and their respective weights. The higher the index score, the better the product aligns with your organization's requirements. Below is a table that will help you evaluate these products based on multiple data points.

2.6. Weighted Analysis

Apply weightage to each criterion to account for the varying importance of evaluation criteria. The weighting [13] can be subjective, based on the organization's unique needs, or determined through surveys and consultations with relevant stakeholders.

2.7. Calculate Index Scores

The final step involves calculating an overall index score for each RPA product by multiplying the scores assigned to each criterion by their respective weights and summing them up. The index scores provide a quantitative measure of the suitability of each product and assist organizations in making data-driven decisions.

3. Utilizing POC for Final Selection

Proof of Concept (POC) [20] is a crucial step in the decision-making process when selecting an RPA product. It allows organizations to assess the shortlisted solutions based on their top criteria and evaluate their performance in real-world scenarios. For instance, if an organization prioritizes open-source or cloud-enabled tools and ease of development, it can select UiPath and Robocorp as potential candidates for the POC.

Metrics-driven agile methodology can be applied to ensure the POC is completed promptly, meeting the organization's needs. Organizations can delve deeper into these criteria during the POC by evaluating openness, flexibility, cloud compatibility, ease of development, and integration capabilities.

Table 1. Feature comparison of top RPA products

Criteria	Automation Anywhere [15]	UiPath [16]	Blue Prism [17]	Robocorp [10]	Power Automate [18]
Price	Varies based on edition and features	Varies based on edition and features	Custom pricing model	Varies based on edition and features	Varies based on edition and features
Infra Requirement	On-premises, Cloud	On-premises, Cloud	On-premises, Cloud, Hybrid	On-premises, Cloud, Hybrid	Cloud-based
Security & Compliance	Strong security features, compliance with industry standards	Robust security, compliance with industry regulations	Strong security, compliance-oriented approach	Secure architecture, compliance with industry standards	Strong security, compliance with industry regulations
Ease of Use	User-friendly, intuitive interface	Easy to use, extensive training resources	User-friendly, code-free automation	Code-friendly, developer-centric	User-friendly, no-code automation
Intelligent Automation Tech	Advanced AI/ML capabilities, integrated IQ Bot	AI Fabric, UiPath AI, Document Understanding	Digital Workers, Blue Prism Decipher	No built-in AI capabilities	AI Builder, UI flows
Out-of-Box Solutions	Pre-built bots, templates	Pre-built automation	Limited pre-built bots	No out-of-box solutions	Pre-built connectors
Sustainable	Emphasizes sustainable automation	Sustainable automation strategy	Focus on sustainability	Emphasizes sustainability	Microsoft focuses on sustainability
Developer Community	Active and diverse community	Large and active community	Active community	An active and growing community	Large and growing community
Marketplace Solutions	Bot Store with various solutions	UiPath Go! marketplace	Blue Prism Digital Exchange	Robocorp App Marketplace	Microsoft Power Apps ecosystem
Implementation Time	Moderate	Moderate to Fast	Moderate to Fast	Fast	Fast
Customer Size	Medium to Large Enterprises	Small to Large Enterprises	Medium to Large Enterprises	Small to Medium Enterprises	Small to Large Enterprises
Quality of Support	Good	Excellent	Good	Good	Good
Drag and Drop Editors	Yes	Yes	Yes	Yes	Yes
Ease of Setup	Moderate	Easy	Moderate	Easy	Easy
Ease of Admin	Moderate	Easy	Moderate	Moderate	Easy
Queue Management	Yes	Yes	Yes	Yes	Yes
Password Management	Yes	Yes	Yes	Yes	Yes
Integration with Other Apps	Excellent	Excellent	Excellent	Good	Excellent
OS Support	Windows, Mac OS	Windows	Windows	Windows, Mac OS	Windows
Okta/SSO Integration	Yes	Yes	Yes	Yes	Yes
Developer Community Size	Large	Large	Medium	Medium	Large
Scalability	Highly scalable	Highly scalable	Highly scalable	Highly scalable	Highly scalable
Cognitive Automation	Yes	Yes	Yes	No	Yes
Analytics & Reporting	Yes	Yes	Yes	Yes	Yes

By testing the RPA products within their environment and conducting pilot projects, organizations can gain valuable insights into how well the solutions meet their specific needs and requirements.

The results of the POC, coupled with the index scores obtained through scientific evaluation, form the basis for making an informed decision on the final selection of an RPA product. Organizations can analyze each solution's performance, compatibility, and ease of use, ensuring it aligns with their goals and business processes.

4. Conclusion

The Indexing Robotic Process Automation products using scientific methods offer an objective and data-driven approach to comparing different RPA solutions. This approach allows businesses to assess RPA products based on their functional capabilities, performance, scalability, user-friendliness, security, and support, all crucial factors in the selection process.

Organizations can align the index scores with their needs and priorities by applying weights to evaluation criteria. This method reduces the likelihood of subjective bias, resulting in a more informed decision-making process. [22]

However, it is essential to acknowledge that no indexing method can be entirely foolproof. The dynamic nature of the RPA industry means that new products may emerge, or existing ones may undergo significant updates, impacting their performance and relevance. Therefore, regular reassessment of the indexing criteria and weights is recommended.

In conclusion, a scientific approach to indexing RPA products empowers businesses to make strategic decisions that align with their unique automation goals. By systematically comparing the capabilities and attributes of various RPA solutions, organizations can select the most suitable product to enhance their efficiency, productivity, and overall automation success.

References

[1] Wil M. P. van der Aals, Martin Bichler, and Armin Heinzl, "Robotic Process Automation," *Business and Information Systems Engineering*, vol. 60, pp. 269-272, 2018. [CrossRef] [Google Scholar] [Publisher Link]

[2] Judith Wewerka, and Manfred Reichert, "Robotic Process Automation - a Systematic Mapping Study and Classification Framework," *Enterprise Information Systems*, vol. 17, no. 2, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[3] Deeksha Baweja, "A Comparative Analysis of Automation Anywhere, UiPath, and BluePrism," *2023 3rd International Conference on Advance Computing and Innovative Technologies in Engineering,* pp. 1715-1718, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[4] Gartner Magic Quadrant for Robotic Process Automation, Gartner, 2023. [Online]. Available: https://www.gartner.com/en/documents/4595599

[5] HFS Top 10 Robotic Process Automation (RPA) Software Products 2020, HFS, 2020. [Online]. Available: https://www.hfsresearch.com/research/hfs-top10-robotic-process-automation-software-products-2020/

[6] Robotic Process Automation (RPA) – Technology Provider Landscape with PEAK Matrix® Assessment 2022, Everest Group, 2022. [Online]. Available: https://www.everestgrp.com/peak-matrix/automation-rpa-ai/robotic-process-automation-rpa-technology-provider-landscape.html

[7] Sai Madhur Potturu, "Maximizing the Efficiency of Automation Solutions with Automation 360: Approaches for Developing Subtasks and Retry Framework," *Intelligent Control and Automation*, vol. 14, pp. 19-35, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[8] Anirban Ghosal et al., "A Scholastic Approach to Design Flight Booking Browser Automation," *Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal*, vol. 12, no. 1, pp. 173–175, 2023. [Google Scholar] [Publisher Link]

[9] Henrique S. Mamede, Carina Maria Gonçalves Martins, and Miguel Mira da Silva, "A Lean Approach to Robotic Process Automation in Banking," *Heliyon*, vol. 9, no. 7, pp. 1-15, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[10] Unlock the Potential of Automation and Generative AI Through Intelligent Bots, Robocorp, [Online]. Available: https://robocorp.com/

[11] Fahim Sufi, "Algorithms in Low-Code-No-Code for Research Applications: A Practical Review," *Algorithms*, vol. 16, no. 2, pp. 1-23, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[12] Narayanan Ganesh, "Efficient Feature Selection Using Weighted Superposition Attraction Optimization Algorithm," *Applied Sciences*, vol. 13, no. 5, pp. 1-26, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[13] Aleksandre Asatiani, Olli Copeland, and Esko Penttinen, "Deciding on the Robotic Process Automation Operating Model: A Checklist for RPA Managers," *Business Horizons*, vol. 66, no. 1, pp. 109-121, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[14] Aleksandre Asatiani, and Esko Penttinen, "Turning Robotic Process Automation into Commercial Success – Case OpusCapita," *Journal of Information Technology Teaching Cases*, vol. 6, no. 2, pp. 67–74, 2016. [CrossRef] [Google Scholar] [Publisher Link]

[15] Automation 360, Automation Anywhere, [Online]. Available: https://www.automationanywhere.com/products/automation-360

[16] Hardware and Software Requirements, UiPath, 2022. [Online]. Available: https://docs.uipath.com/studio/standalone/2022.10/user-guide/hardware-and-software-requirements

[17] Software Requirements, Blue Prism, 2023. [Online]. Available: https://bpdocs.blueprism.com/en-us/supported-software.htm

[18] Prerequisites and Limitations, Microsoft, 2023. [Online]. Available: https://learn.microsoft.com/en-us/power-automate/desktop-flows/requirements

[19] Plans and Pricing, UiPath, [Online]. Available: https://www.uipath.com/pricing

[20] Javier Fuentes-Martín et al., "A Proof of Concept for Matchete: An Automated Tool for Matching Effective Theories," *The European Physical Journal C*, vol. 83, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[21] Vaishali Mane, and Rahul Bagai, "The 4D Model: Metrics-Driven Business Growth with SaaS Case Studies," *SSRG International Journal of Computer Trends and Technology*, vol. 71, no. 4, pp. 102-107, 2023. [CrossRef] [Google Scholar] [Publisher Link]

[22] How to Calculate Weighted Average in 3 Steps, Indeed, 2023. [Online]. Available: https://www.indeed.com/career-advice/career-development/how-to-calculate-weighted-average