

Robotic process automation (RPA) and agents with BPMS to increase autonomous capability and operational improvement in organizations: a practical assessment

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***Abstract.** Robotic Process Automation (RPA) tools have recently incorporated autonomous LLM-based agents to automate complex human-interaction tasks without disrupting internal systems. Its use within Business Process Management Systems (BPMS) enables process optimization, error minimization, and reduced time commitment. This study presents a practical evaluation of UiPath, Microsoft Power Automate, and Automation Anywhere, and their integration with Camunda BPMS through three automation scenarios. The results indicate that all tools contribute to increasing autonomous capacity and improving operational processes, with strengths in different characteristics.*

1. Introduction

Robotic process automation (RPA) [van der Aalst et al. 2018] has developed in recent years as a contribution to process improvement, focusing on the use of software robots to perform tasks that are usually carried out by humans [Enríquez et al. 2020, Syed et al. 2020] within Business Process Management (BPM) [Dumas et al. 2018]. Tasks that RPA automate are repetitive ones, such as data entry or validation, and do not require changes or replacements to existing information systems or Business Process Management Systems (BPMS). RPA tools have recently incorporated autonomous agents (Agentic) based on Large Language Models (LLMs) [Dumas et al. 2026], capable of deeper reasoning about the state of the process and determining what action to take at any given time. In this context, we present a practical evaluation of three RPA tools and their integration with a BPMS through three automation scenarios.

2. Comparative evaluation

In a previous theoretical evaluation [Giaccio et al. 2026], the selected tools, Power Automate and Automation Anywhere, were compared based on their existing documentation. In this practical evaluation, we incorporated the UiPath tool and its integration with Camunda BPMS through three scenarios: i) Basic Bot, ii) Bot + Agentic, and iii) BPMS integration. A technical evaluation of the selected features was performed to compare the functionalities of each tool. The **Development and Operability** category was the main focus of the analysis, as it encompasses the most relevant aspects for a practical comparison of the selected RPA tools. This category has two main subcategories: Automation process development and convenience, and Robot management and operability, which we evaluated using a 5-point Likert scale (1 = lowest, 5 = highest). Figure 1 presents a graphical comparison of each tool. Evaluation code and materials are accessible in [Jorcín and Delgado 2025].

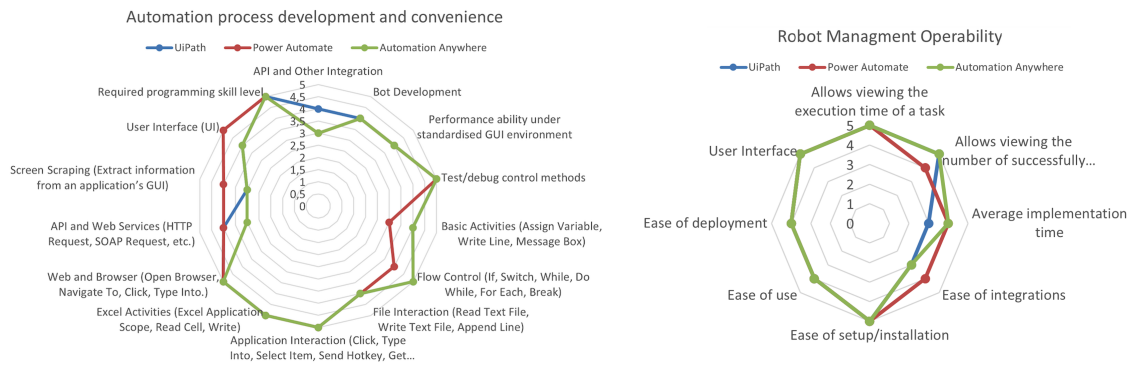


Figure 1. Characteristic evaluation summary

3. Conclusions

The results show that each tool offers advantages in different aspects of automation development and execution. UiPath provides greater control over workflow, variable management, and interaction with desktop applications, making it particularly well-suited for complex and highly structured automations. Power Automate stands out for its direct integration with cloud services and rapid deployment in Microsoft-based environments, enabling hybrid workflows with automation in both cloud and desktop. Automation Anywhere positions itself as an intermediate alternative, with a strong focus on centralized bot orchestration and execution control through the Control Room. The choice depends primarily on the type of process to be automated and the technological and organizational environment, rather than on any overall superiority of one platform over the others.

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