PERSPECTIVE

RPA VALIDATION PITFALLS AND HOW TO AVOID THEM

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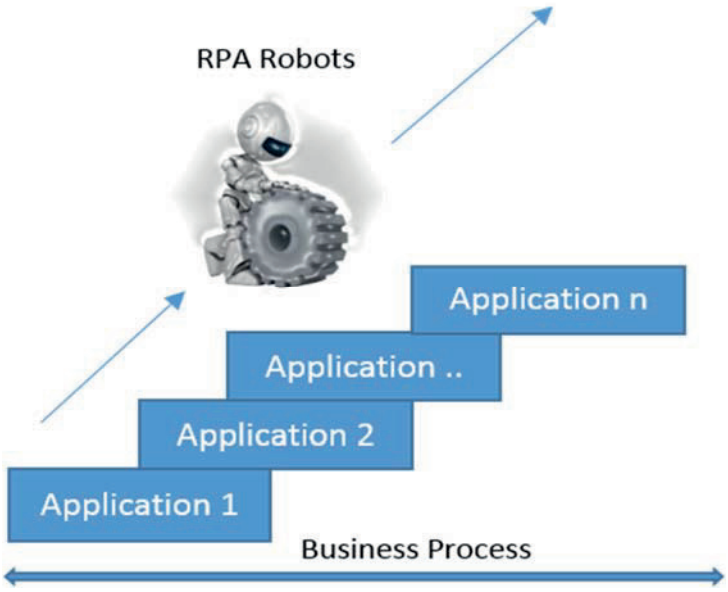
Abstract

While many organizations are adopting robotic process automation (RPA) to increase operational efficiency, the approach for testing and validating robots is still a software-first strategy. The lack of the right testing and validation strategy can result in under-performing robots that are unable to meet the desired business and efficiency outcomes. This paper outlines erroneous RPA testing strategies and provides an effective approach to RPA validation.

Introduction

To execute any business operation or workflow in large enterprises, services personnel or business teams usually work with multiple IT applications. Robotic process automation (RPA) can automate these business workflows across multiple and disparate applications using software robots that mimic the actions of human users as depicted below:



The increased adoption and criticality of RPA for business process automation makes it essential to design and build RPA robots that exceed the level of productivity and quality delivered by human users. However, many RPA robots tend to underperform due to poor design and improper implementation in addition to workload scheduling decisions. Further, QA teams struggle to identify these issues during robot validation primarily due to recurring test strategy and test execution challenges as described below:

What to test	How to test	Where to test
Focus on validating IT application functionality: Since business process automation is always implemented on applications used by the business, it is fair to assume that these applications are tested and work properly in production. However, QA teams continue to invest significant effort to validate application behavior like querying the database to verify data updates, checking error messages in case of negative scenarios, etc. **Missing non-functional requirements driven by the operating environment:** Sometimes, validation teams miss out on capturing and validating operating environment requirements like business SLAs, process execution window and dependent activities.	**Validation of robots as software:** One of the most striking challenge is that validation teams treat robotic process testing as software validation. Their approach focuses on test steps automation, validation of the Robot inputs with database and re-verification of steps performed by Robots. While some of these validation steps are relevant, teams tend to miss the key validations required for seamless and predictable functioning of RPA robots. **Automating RPA testing:** There are many instances where efforts are made to automate RPA testing using test automation tools without much clarity on what needs to be automated when RPA itself works in an automated manner.	**Validation in incorrect environments:** Many QA teams begin validating RPA robots in SIT and other lower environments where the application baseline is usually not in sync with the production environment. This asynchrony results in robots failing to perform in the production environment during the first few runs.

A successful example of robot validation

A good example for RPA validation can be gleaned from the manufacturing industry that has successfully deployed physical robots over many years with a very high level of quality and predictability. On comparing how physical robots are tested with how RPA robots should be tested, the following key testing attributes emerge:

1. The robot's ability to perform as per the instructions
2. The robot's ability to perform tasks autonomously
3. The robot's ability to perform at higher efficiency
4. The robot's ability to handle exceptions gracefully

A recommended approach for RPA validation

Combining the knowledge of software validation with the processes followed by the manufacturing industry for robot validation provides a fitting approach for RPA validation that overcomes the testing challenges mentioned above:

What to test	How to test	Where to test
Validation scenarios: Since robots are designed to mimic business workflows, companies can re-use/create test cases similar to UAT test cases for RPA validation. The focus should be on validating business flows and business exceptions rather than application functionality **Non-functional requirements validation in the operating environment:** Teams should capture non-functional requirements like the ability to operate autonomously, SLA delivery efficiency and expected volume to be processed within preset timeframes	**Functional validation of robots:** Validation teams should set up the input case data for all business cases within the determined scope and then begin robot processing. They should also validate the outcomes and re-runs in cases of errors/unexpected outcomes **Exception scenarios:** Teams should set up the inputs case data with exception scenarios and validate the robot's ability to identify and report these exceptions for human intervention. They should also re-run and validate these tests in case of errors/unexpected outcomes	**UAT or higher environments:** QA teams should perform validation of RPA only in UAT or higher environments to prevent issues arising from incorrect application versions or environment set-up **Stabilization in production:** Teams should train robots with simple cases and at low volume during initial runs and gradually increase complexity and volume to ensure minimal impact in case of any processing mismatch

Skill recommendations

RPA validation teams should have a deep understanding of business processes across regular and exception workflows to ensure that robots are tested for all possible business scenarios. Additionally, the teams should be well aware about the scheduling mechanism and controller team operating model of the RPA robots so that they can validate the operational efficiencies of RPA robots before deployment into production. Each RPA validation team should also leverage a shared team of experts who have in-depth knowledge of object design and error handling mechanisms. This is important to maintain focus on the performance tuning of robots to meet the operational efficiency requirements.

As the RPA ecosystem continues to evolve, one can expect more complex robot implementations with optical character recognition (OCR) and natural language processing (NLP) inputs as well as AI integrations. Moreover, robots will increasingly compete for shared resources like server time and application access to complete the business processes. In such a scenario, RPA validation teams should continue acquiring in-depth knowledge on evolving validation needs and improve the strategies to support these complex business requirements.

Exit criteria

Before a robot is deployed into production, it is important to check that it has been validated to exceed the business benchmarks and is predictable. Here are some key parameters that should be considered as the exit criteria for robots before they are deployed into live production:

- The adherence to business SLAs should be higher than that of manual processing SLAs
- The number of business processing exceptions should be equal to or less than the number of manual processing exceptions
- The total number of cases processed without human intervention should be equal to or greater than 95% of the in-scope cases
- Robot availability should exceed 98%

Typically, robots meeting these criteria are well-placed to take over business processing responsibilities from human users and are proven to deliver the desired business benefits.

Conclusion

RPA has the potential to transform how organizations execute business workflows by enabling higher efficiency, faster outcomes and almost error-free operations. One of the key success drivers is the right testing strategy for RPA validation. Validating robots using existing software testing models is ineffective because it often results in non-performing or under-performing assets. To overcome this challenge, organizations need a strategy that tests the robot's capacity to work autonomously, handle exceptions well, operate at higher efficiency, and follow preset instructions. With the right validation approach, skills and exit criteria, RPA can help organizations meet the desired business outcomes of error-free, predictable and efficient business operations.

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