



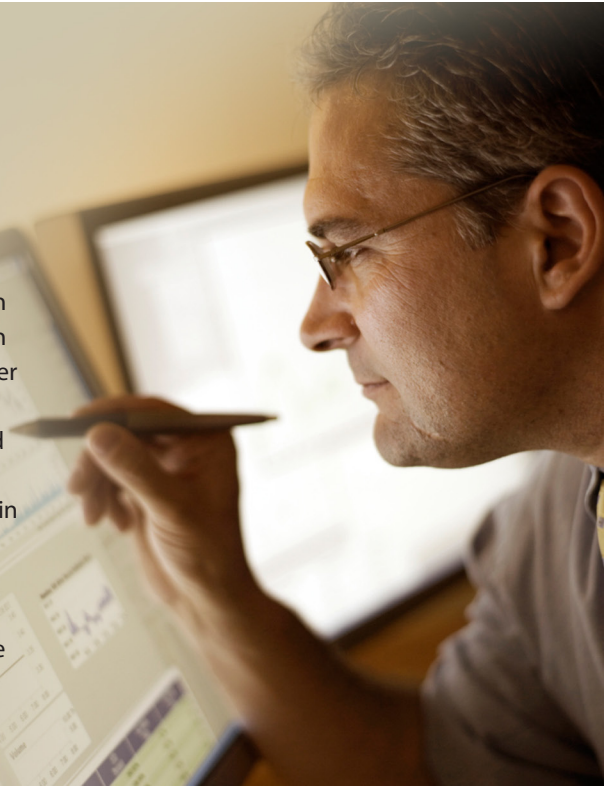
Test Automation at the Enterprise Level

- Gareth Locke, MLC | Reghunath Balaraman, Infosys

Abstract

If test automation has been around for a long time then why have organizations failed to implement enterprise-wide test automation? Well, the attempts have ended in failure due to the inconsistent and unsustainable manner in which test automation has been implemented. Breaking away from the conventional approach and adopting a methodology which measures the technical and financial aspects of test automation at an organizational level helps realise the vision of enterprise-wide automation. The following point-of-view co-authored by individuals from MLC and Infosys, and based on their experiences, describes a successful approach to implementing enterprise-wide test automation.

The perpetual demand for faster time-to-market and reduced cost of quality, invariably leads Quality Assurance (QA) teams to test automation. Most organizations have even adopted test automation, if only in large programs. However few organizations, if any, have been able to reap the benefits of test automation in an enduring manner. The blame for this rests fairly and squarely with the manner in which test automation has been approached. Typically, in an organization, large programs with sizeable budgets invest in automation since they are able to demonstrate ROI and other benefits in more compelling fashion. These programs, as one might imagine tend to focus on quick deployments and not on reuse or long term development of the automation processes. Over a period of time QA teams struggle to sustain the same benefits that automation previously provided. Does this mean automation's role is limited to short term gains? No, not if one were to develop test automation in a sustainable and consistent manner. In fact it is even possible to successfully implement test automation across the enterprise, leading to greater benefits.



The case for enterprise wide test automation

Enterprise wide test automation is a very compelling proposition for organizations. The heterogeneous IT landscape prevalent in most organizations requires regular updates and enhancements - delivered as part of the so called Business-As-Usual (BAU) programs - to ensure uninterrupted business operations. The BAU efforts of an organization are substantial and optimizing/automating the testing of these programs can yield significant gains. Further, the benefits of automation can even be extended to smaller programs whose budget would have otherwise prevented investments in automation.



Reasons for failure of enterprise wide automation

Past attempts at enterprise wide automation have failed due to the lack of a consistent and sustainable automation strategy.

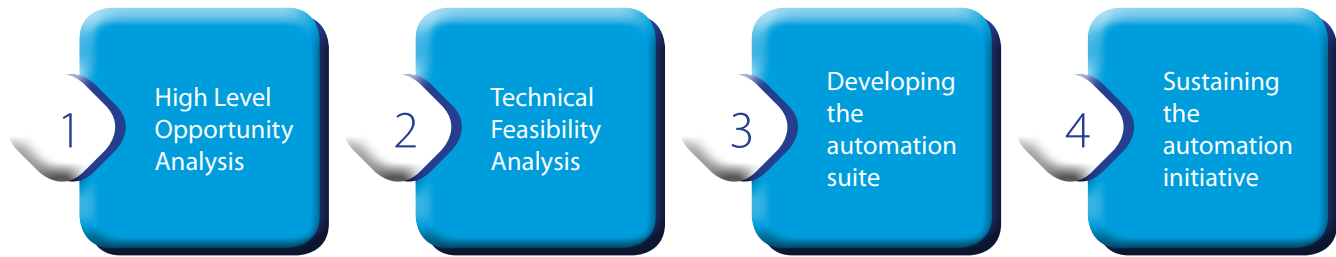
Since automation is generally taken up at the program level, depending on budget availability and ROI analysis, each program adopts its own automation framework and tools. Maintaining different frameworks and tools at an enterprise level is a challenge and hence attempts at scaling the automation to an enterprise level end in failure.

Sustainability, or rather the lack of it, too plays its role in hampering enterprise-wide implementation of test automation. The development teams make frequent changes to the application as part of on-going maintenance and upgrade programs. This necessitates analyzing the impact of these changes and modifying the automation suite accordingly. However this gets ignored since the team focuses on manual testing and at times prefers to continue testing manually even test cases which can be automated - a consequence of crunched timelines for testing and lack of automation skills.

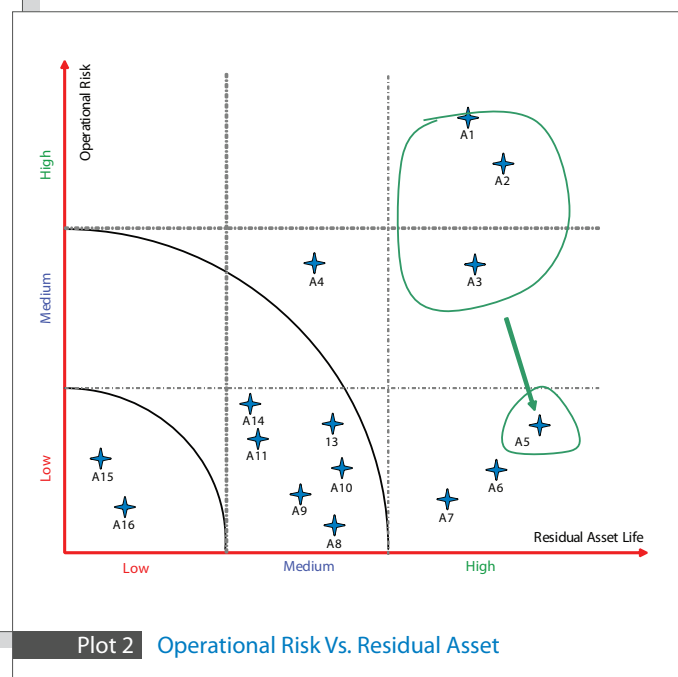
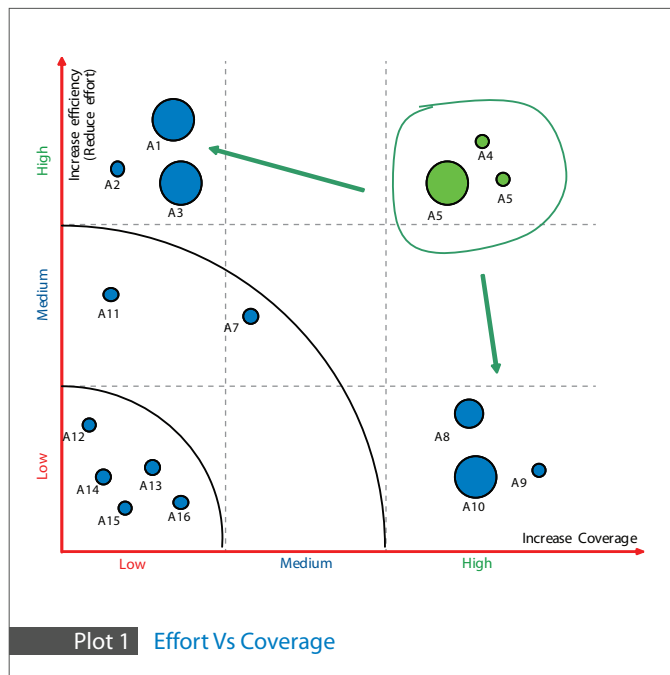
Over a period of time the inconsistent and unsustainable approach lead to obsolete automation suites which don't yield the results the team anticipated at the start of the automation exercise. Hence what is required is a deeper analysis of the organization's IT assets and a strategy focused on long term benefits.

Myth to Reality – Implementing Enterprise-Wide Automation

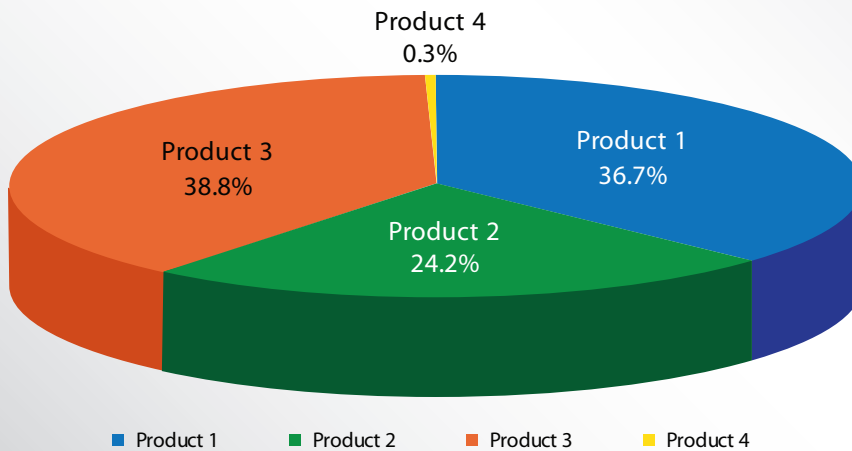
Based on our experience we propose a strategy which starts by analyzing the current IT landscape of the organization, the potential for test automation and the long term benefits that automation would provide. The strategy includes the following phases -



During the high level opportunity analysis, the team should identify and prioritize automation of assets. This is where the seeds of enterprise-wide test automation are sown. To ensure enterprise-wide test automation the prioritization of test automation needs to take in to consideration parameters such as extent of regression test coverage, application stability, residual life of applications, opportunity to improve test efficiency, available budgets for test automation etc. For instance only applications which are stable would be considered for test automation. Also applications whose life span is nearing an end wouldn't be ideal candidates for test automation.



After we complete the identification of assets whose automation would lead to realisation of potential benefits and before we begin the implementation of automation, the technical feasibility of the process also needs to be established. During this process the quality assurance teams need to understand the application technology and types of validation which would be required. Next, they also need to evaluate the capabilities of the test management tools available within the organization to support these requirements. This is essential since test management tools and automation tools are used in conjunction with each other.



Product wise Automation Coverage

Product	No. of Test Cases
Product 1	255
Product 2	168
Product 3	269
Product 4	2

Total test cases that can be automated: 694

Priority wise Automation Coverage

Product	No. of Test Cases
P1 - Critical	158
P2 - High	186
P3 - Medium	149
P4 - Low	27

Priority is available for 520 test cases out of 694 test cases considered for automation.

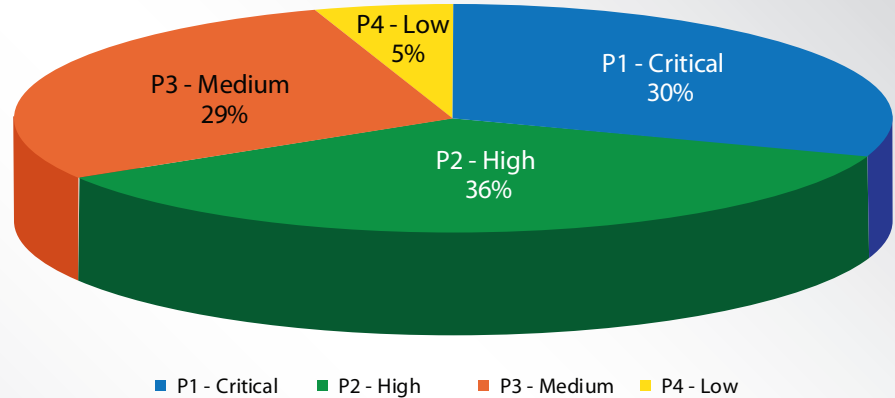


Figure 1 - Analysis Results (representative)

It is advisable to score the test cases on important automation suitability parameters before embarking on the automation process as this helps identify test cases which are more suited for automation. Prioritization of the automation process itself can be taken up based on business priorities and test scenario coverage to ensure the development of an optimum test automation suite.

3

Development of the test automation suite

The most important step during the test automation process is the selection of an appropriate test automation framework itself. Teams can select an appropriate framework based on the validations required, extent of reuse and effort involved in maintaining the automation suite. A data-driven framework is generally better suited for highly repetitive testing involving similar data while the keyword driven framework is typically adopted when testing involves performing actions on the applications. It is advisable to evaluate the framework by conducting a proof-of-concept on a small scale involving a handful of test cases.

4

Sustaining the automation initiative

Once the test automation suite has been created, it is important to ensure it doesn't become obsolete as new enhancements and modifications are made to the existing applications. This requires the automation suite to be updated regularly. However the test team may not always have the required automation skills to do so or the time available may be insufficient to make changes to the script and complete testing. Hence instating a dedicated team to maintain the test automation suite is necessary. Every time an application undergoes a modification or enhancement, the team analyzes the existing automation suite to determine the impact on existing automation scripts. While minor modifications can be handled by this team, development of new test cases and their subsequent automation requires considerable time and effort and is deferred to a future release. Of course the test team responsible for manual testing is kept informed of the reduced test automation coverage as it requires them to test the new scenarios manually, as is always the case with first-time testing.

Conclusion

Implementing automation at the enterprise level helps organizations streamline (read as reduce costs) their business-as-usual programs. More importantly, they are able to do so while improving time-to-market and quality. All it requires is for the test team to develop a long term test automation strategy based on a careful evaluation of the organization's IT assets. Surely, investing in enterprise-wide test automation makes more sense than investing in program level test automation which only provide short term gains.



About the Authors

Gareth Locke, Head of Testing, MLC

Gareth started out as a developer, working on ticketing systems for the channel tunnel in the UK! He first moved into Project Management, working for a brewery before shifting over to the Royal Mail Group. His first brush with the financial industry was with a large internet banking business in London, and it included setting up an off-shore quality assurance function for the bank, increasing the quality and timeliness of releases. After moving to Sydney in 2005, Gareth worked in delivery consulting roles, including a brief stint with Ernst & Young, before taking on responsibility for Testing Services at MLC, the wealth management division of the National Australia Bank (NAB) which manages \$122 billion on behalf of individual investors and corporate customers in Australia.

Reghunath Balaraman, Principal Consultant, Infosys

Reghu has over 16 years of experience, working for clients in Banking and Financial Services, Manufacturing and Telecommunication industry. He helps clients build robust and scalable test organizations by assessing the maturity of the existing test organizations and developing a roadmap to achieve the required transformation.

Reghunath is also an active member of several international forums such as TMMI Foundation and The System Dynamics Society, and regularly contributes to forums for software testing.

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