

Flexible Approach to **Test Automation with TEAF**

Mission critical software endures demanding functional tests, especially supported by automated testing frameworks. Automating these frameworks and sustaining quality software releases are critical to business performance.



Table of Contents

1.	Abstract	3
2.	Current State of Test Automation	3
2.1	Various types of available automation framework options are:	4
3	Challenges in Test Automation	4
4	Selecting the Right Automation Framework	5
5	Royal Cyber Approach	5
5.1	Making automation easy with RC TEAF towards automation tester	6
6	TEAF Architecture	7
6.1	TEAF - 5 Step Test Automation Process	7
6.1.1	Page Object Repository	8
6.1.2	Feature File	8
6.1.3	Galen Spec	8
6.1.4	TEAF Compatible	8
6.1.5	Report Generation	8
7	Achieve Continuous testing with Open stack technology & DevOps Tools	8
8	Conclusion	9

1. Abstract

Mission critical software endures demanding functional tests, especially supported by automated testing frameworks. Automating these frameworks and sustaining quality software releases are critical to business performance. Organizations time and again face the problem of managing resources and balancing costs to make sure that automation frameworks refuge all the business scenarios and the applications delivered are error-free.

By means of executing the appropriate automated testing framework, organizations can considerably intensify the accuracy and speed of the testing process, deliver a higher return on

investment from software projects and steadily minimize risk.

According to Gartner, "Organizations spend nearly 20% of their SDLC time in system testing and defect removal, and testing is typically 15%-20% of IT budgets".

This paper explores the current state of test automation, highlights the challenges faced by organizations, and underscores the need to select the right framework. It also introduces TEAF – a test automation framework – and looks at how it can help businesses become more competitive.

2. Current State of Test Automation

Recent times have seen companies embracing new trends such as eCommerce, social media marketing, Big Data analytics, Cloud-based solutions, mobile marketing, and mobile app development. Best-of-breed vendors help them quickly on-board technology solutions, allowing them to drive greater business value with agility.

However, for companies to attain business agility, they first need to embed agility in their underlying software and business processes. Here, the role of test automation becomes critical. The evolution of test automation has been a long journey from crudely stitched code that provided specific or stop-gap fixes to today's well-defined and

structured automation test suites.

Companies that adopt test automation still contend with several challenges such as identifying the optimum amount of test automation coverage, maintaining up-to-date automation test cases, and creating reusable test scripts. Further, there are several approaches for test automation and most companies are often unsure of which is best suited for their technology landscape.

Choosing the right approach presents a significant challenge as a single automation framework cannot meet all the needs of a project.

Additionally, the implementation of an automation framework depends on the type of application and the end-goals of the automation process. Thus, the adoption of test automation solutions often requires significant customization for different projects, making it a tedious task that involves considerable manual

effort. These approaches have led to successful solutions for domains like Gaming, Consumer Lending, Media & Entertainment, Manufacturing, etc. The deployment of the framework has been approximately 30% each for Gaming and Consumer Lending while 14% in manufacturing projects.

2.1. Various types of available automation framework options are:

- Keyword-driven
- Data-driven
- Hybrid
- BPT

3. Challenges in Test Automation

Despite the known business benefits of test automation, it is important to understand that test automation is not a magic wand. There are numerous factors that can compromise the integrity of a test automation solution. For

example, automation engineers responsible for deciding whether an organization should adopt test automation frequently overlook factors that may impact the success. The most common reasons for failure of test automation are:

- Lack of experience in framework design and/or implementation
- Inability to easily incorporate enhancements
- Absence of Proof-of-Concept (POC) or pilot phases
- Lack of in-depth analysis on test reports or logs
- Lack of clarity on what to test and what to exclude
- Absence of exceptions and error recovery functionalities within the framework
- Improper maintenance of the object repository

The best solution is one that fulfills the unique requirements of an organization and drives collaboration between development, QA and business development teams. This can ensure transparent and effective communication on time frames and deliver the required scope and

quality of end-user experience. The absence of efficient communication between these three teams can lead to critical process failures. Thus, companies first need to ensure that they have identified the 'right reasons' for adopting test automation.

- Poorly designed software architecture
- Improper identification of automation goals
- Choosing the wrong automation framework

4. Selecting the Right Automation Framework

When making the selecting the frameworks, companies should be aware that testers face certain limitations. The final choice of the right framework must involve a careful analysis of the goals of the organization along with an understanding of what is available in the market.

The best-fit automation framework is a single standard solution that addresses existing and

future challenges, delivers optimum test coverage, and ensures time and cost efficiencies. It should deliver concrete results such as a unified test library, standardized scripting, maximum reusability of scripts, etc. It should simplify user adoption by being intuitive about project requirements and enable all users – including non-technical users – to participate in creating and maintaining test scripts. The right framework should contain:

1. Well-designed structures that provide flexibility for enhancements and changes
2. In-built team member flexibility that allows any user to add or modify scripts
3. Easy-to-use test data and data pool integration
4. Cross browser support
5. Remote machine test execution
6. Parallel test execution support
7. User-friendly customized reports
8. Integration with nightly builds
9. Integration with bug tracking tools
10. Easy maintenance of the object repository

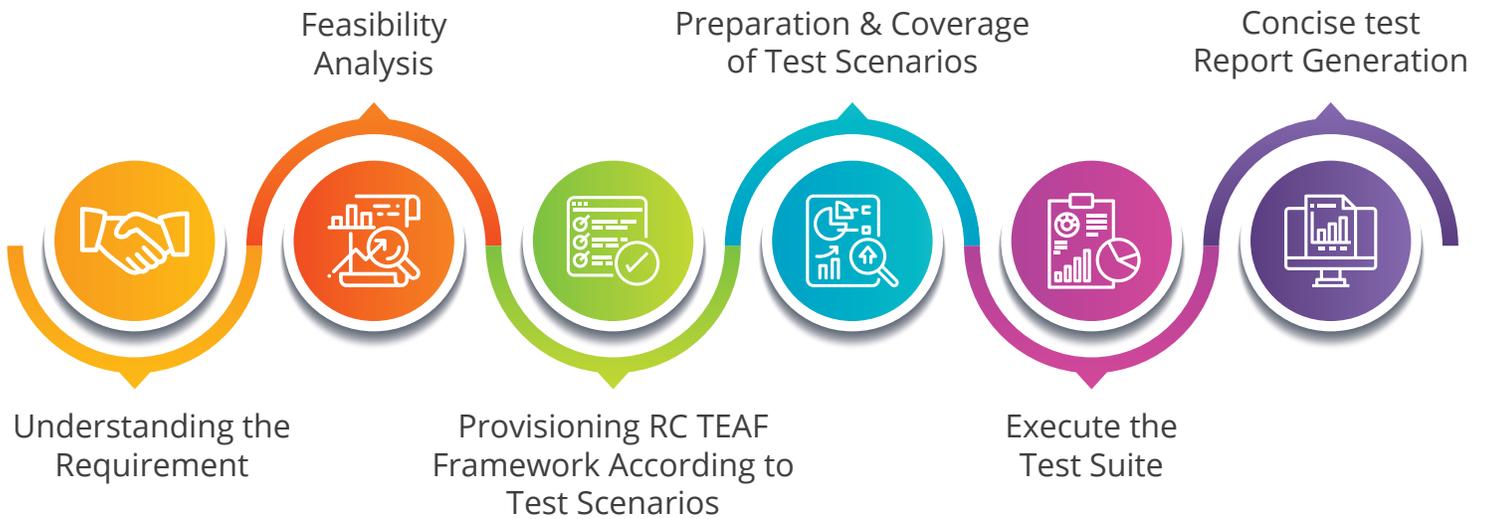
5. Royal Cyber Approach

To overcome the stated challenges and deliver benefits of automation, Royal Cyber has designed a ready-to-use automation platform that can be employed in a variety of projects with minimal customization and maintenance.

The TEAF – imbibes best practices and implementation techniques from multiple automated testing approaches. Such a framework can facilitate various levels of testing for an enterprise application.

Developed using open source tools such as Selenium2/ WebDriver and TestNG frameworks,

TEAF presents a new type of easy-to-use solution that can automate functional and regression testing.

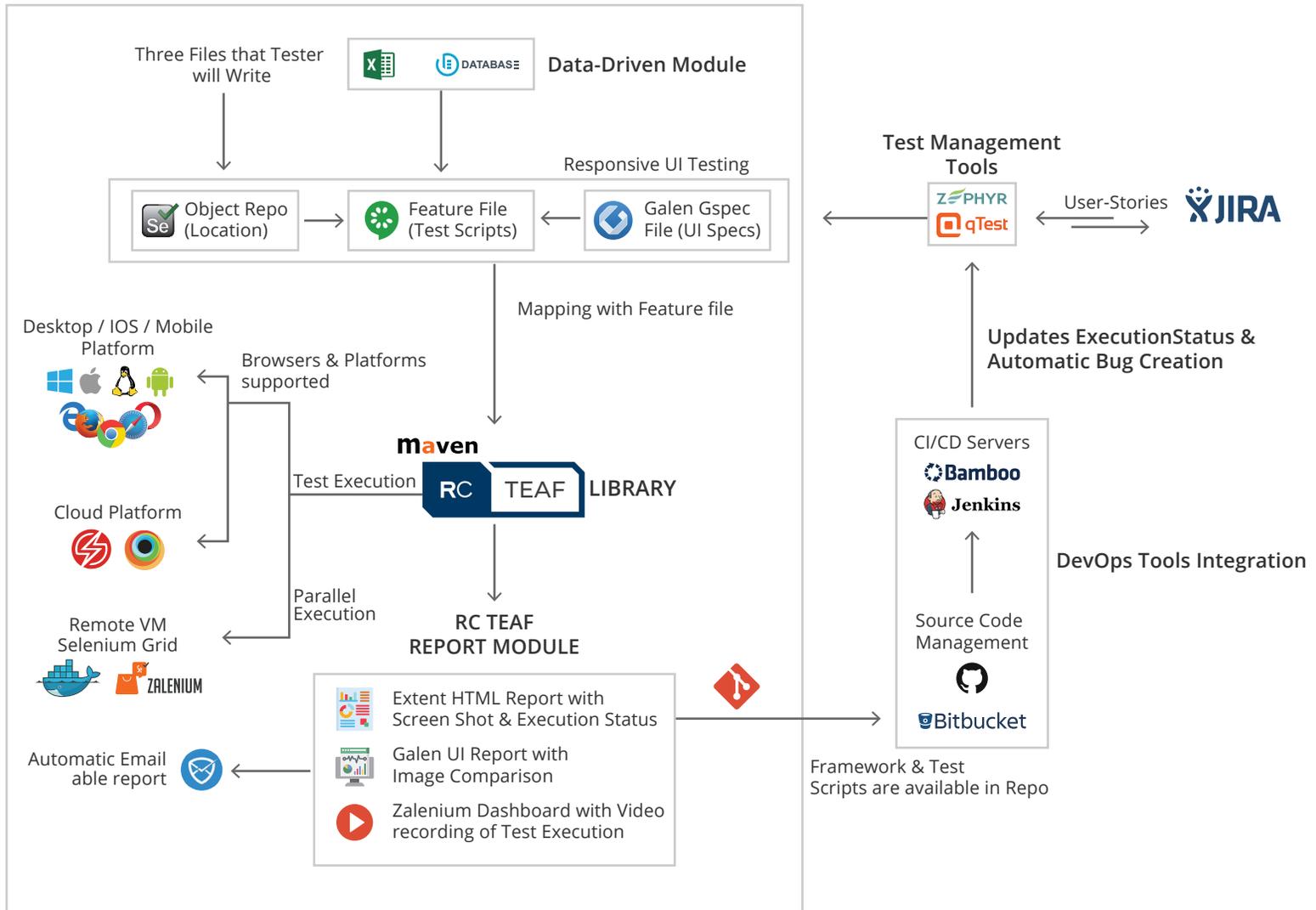


5.1. Making automation easy with RC TEAF towards automation tester:

1. A Unique take on Page Object repository that simplifies the maintenance efforts of scripts.
2. Writing actual automated scripts files as features & scenarios in plain English language readable by the business & product stake holders.
3. Tag based execution brings forth the benefits of keywords driven tests that are easy to maintain while also leveraging the undisputed advantages of hybrid approach to test automation.

One recommended approach for implementing this framework for automated testing, is to easily adapt to your processes. Royal Cyber supports and creates complex tests without writing a single line of code. With Royal Cyber's automation framework, any team can easily implement a myriad of testing types, including data-driven testing and keyword-driven testing.

6. TEAF Architecture



6.1. TEAF - 5 Step Test Automation Process

6.1.1. Step 1: Page Object Repository

- Reusable locators
- Easy Correction for new enhancements
- Modularized Page by Page locator storage
- Name and Value pair

6.1.2. Step 2: Feature File

- Codeless Test Scripts with object and test data's
- Plain English Language.
- Reuse user actions with auto-complete

6.1.3. Step 3: Galen Spec

- Easy to maintain Objects definition
- Web element Specification in English language
- Base-line image comparison for UI Validations

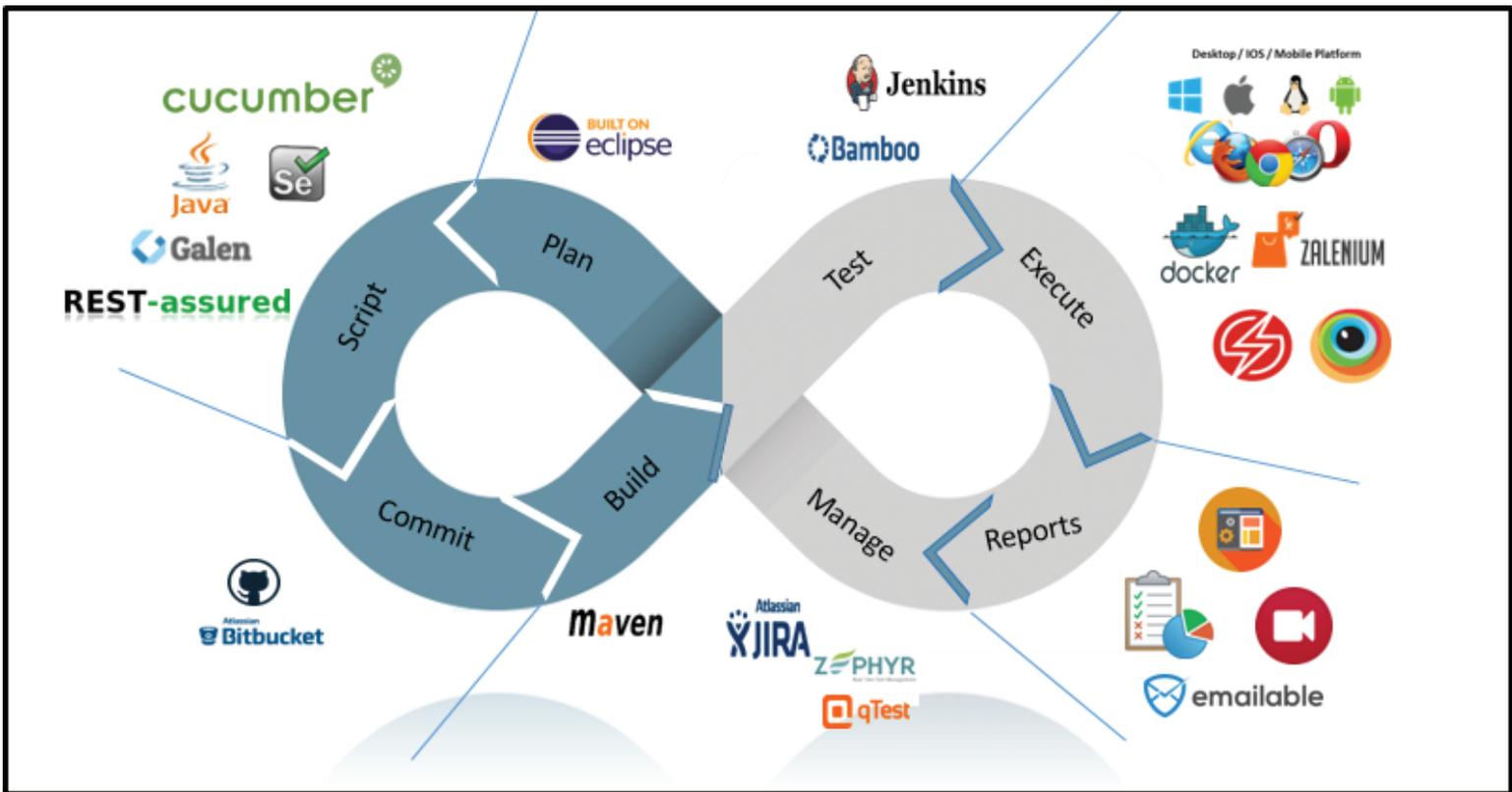
6.1.4. Step 4: TEAF Compatible

- Choose wide range of TEAF Compatible Platforms and Browsers to execute the automation test scripts

6.1.5. Step 5: Report Generation

- Extent Report for End-to-End functional Test Cases execution with Screenshots
- Galen Spec Report for UI Validation for all devices used during Test Cases Execution
- Zalenium Report – Video based for Test Cases Execution
- Auto-generated Email to all stakeholders involved in the project after Test execution

7. Achieve Continuous testing with Open stack technology and DevOps Tools



8. Conclusion

Organizations looking for agility in their business processes need to on-board test automation solutions that ensure superior software quality. Successful test automation frameworks are those that are easy to adopt, simple to maintain and enable flexibility in test data maintenance, parallel execution of test cases, remote machine test execution, and cross browser execution. However, organizations need to choose their automation framework with care to ensure that it realizes their automation objectives.

Royal Cyber automation solution framework TEAF leverages the key success levers of available frameworks, thereby empowering organizations to benefit from best practices. The framework has proven advantages for specialized functional automation such as Mobile testing, DW/BI testing, API testing and Web service testing. With cross-browser support, continuous integration capabilities, reusable scripts, and rule-based testing, TEAF presents a host of advantages for organizations seeking to drive value and agility from superior software.

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Today we stand tall as a One Stop Shop for all your IT needs.