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Testing Web Application using Selenium Testing Tool with Respect to Test'ng

K. Chandrasekhar¹, S.G. Taj²

^{1, 2}(Asst. Prof(Adhoc) Department of Computer Science & Engineering, JNTUA College of Engineering (AUTONOMOUS): Pulivendula

Abstract: *Testing has become the most important parameter in case of Software Development Life Cycle (SDLC). Web Applications tend to continuously evolve and thus need thorough, yet lean, and automatic regression testing. In this installment of software technology we describe automatic regression testing for web applications that uses Selenium framework. Selenium is portable open source software available for Windows, Linux and Macintosh. Tests are written in HTML tables or in a number of programming languages and can run directly in most Web Browsers. Test automation enhances the effectiveness of programming testing procedures. It additionally discovers the imperfections when one may miss in manual testing. Here we use TestNG a testing framework and it overcomes the limitations that exist in JUnit framework. In TestNG Annotations are easier to understand, parallel testing is possible and test cases can be grouped easily in a particular web Application. In this project we generate customized reports by using TestNG for different web Applications in different Browsers. In our proposed TestNG framework we have taken tool selenium under TestNG testing and test web Applications.*

Keywords: *Software Development Life Cycle (SDLC), Automation Testing, TestNG Framework, Junit, Reports.*

I. INTRODUCTION

A. Test Automation for Web Applications

Software applications today are written as web-based applications to be run in an Internet browser. The effectiveness of testing these applications varies widely among companies and organizations. Automation is frequently becoming a requirement for software projects. Test Automation means using a software tool to run repeatable tests against the application to be tested. For regression testing this provides that responsiveness. Test automation has specific advantages for improving the long-term efficiency of a software team's testing processes. Test automation supports:

- 1) Frequent regression testing
- 2) Rapid feedback to developers
- 3) Virtually unlimited iterations of test case execution
- 4) Support for Agile and extreme development methodologies
- 5) Disciplined documentation of test cases
- 6) Customized defect reporting
- 7) Finding defects missed by manual testing

B. Selenium Testing Tool

Selenium is a set of different software tools each with a different approach to supporting test automation. Most Selenium QA Engineers focus on the one or two tools that most meet the needs of their project, however learning all the tools will give you many different options for approaching different test automation problems. The entire suite of tools results in a rich set of testing functions specifically geared to the needs of testing of web applications of all types. These operations are highly flexible, allowing many options for locating UI elements and comparing expected test results against actual application behavior. One of Selenium's key features is the support for executing one's tests on multiple browser platforms.

Selenium is a portable software-testing framework for web applications. Selenium provides a playback tool for authoring tests without the need to learn a test scripting language (Selenium IDE). It also provides a test domain-specific language (Selenese) to write tests in a number of popular programming languages, including c#, Groovy, Java, Perl, , PHP, Python, Ruby and Scala. The tests can then run against most modern web browsers. Selenium deploys on Windows, Linux, macOS platforms. It is open-source software, released under the Apache 2.0 license: web developers can download and use it without charge.

- 1) *Motivation of the Project:* The motivation for performing the “Selenium Testing on Web Application” is to provide quality of a product, to find bugs at early stage, less manual intervention, so possibility of errors diminishes, test scripts are reusable, Annotations are easier to understand, parallel testing is possible and test cases can be grouped easily in a particular web Application. In this project we generate customized reports by using TestNG for different web Applications in different Browsers.
- 2) *Comparison with existing JUnit framework:* A clear view how TestNG framework is different from existing JUnit framework can be explained through the following tabular form.

Table 1.4.1 Comparison

EXISTING JUNIT FRAMEWORK	PROPOSED TEST'NG FRAMEWORK
1. Cannot Support Group tests	1. Supports Group testing
2. Cannot perform dependency test	2. Performs dependency tests
3. Few Annotations are present	3. Additional Annotations are present than JUnit
4. Build for unit tests	4. Wider array of tests

- 3) *Php Travels:* PHPTRAVELS is PHP and MySQL-based travel agency software designed for the online travel and booking industry. The solution is suitable for owners of hotels, vacation rentals, travel agencies, tour operations, rental cars, cruises, restaurants, villas, apartments, bungalows and rooms of all sizes. PHPTRAVELS key features include a booking engine, payment gateways, multi-currency support, multi-language support, content management, social connections, newsletters, reviews and integrations. The content management system of PHPTRAVELS allows users to add, edit, remove pages and files using admin panel. The booking engine of PHPTRAVELS is customizable and includes billing, reports and invoicing. The system supports major payment gateways, including VISA, PayPal, Maestro and others.

II. LITERATURE SURVEY

A. Selenium tool in software testing

Today the vast majority of the product applications executed is composed as online applications which are keep running in a web program. Testing programming applications is critical. Numerous associations make utilization of a specific web application, so the same web applications are tried habitually by diverse clients from distinctive regions physically. Testing a web application physically is tedious, so we go for test automation. In test automation we make utilization of a product device to run repeatable tests against the application to be tried. There are various focal points of test automation. They are exceptionally exact and have more prominent preparing pace when contrasted with manual automation. There are various open source and business devices accessible for test mechanization. Selenium is one of the broadly utilized open source devices for test computerization. Test automation enhances the effectiveness of programming testing procedures. Test automation gives quick criticism to engineers. It additionally discovers the imperfections when one may miss in the manual testing. In test automation we can perform boundless emphases for testing the same example of code ceaselessly commonly.

B. Web Applications tests with selenium

Web applications tend to continuously evolve and thus need thorough, yet lean and automatic, regression testing. In this installment of Software Technology, Andreas Kornstadt and his colleagues describe automatic regression testing for Web applications that uses the Selenium testing framework. Selenium is portable open source software available for Windows, Linux, and Macintosh. Tests are written as HTML tables or in a number of programming languages and can run directly in most Web browsers.

Selenium Core modify and check an Ajax application using commands in Selenese, Selenium's control language. Selenium RC remotely controls Selenium Core using common programming language. Selenium Grid use several remote controls in parallel to expedite testing. Selenium IDE capture and replay tests from within Firefox.

C. Analysis of Performance Testing on Web Applications

Web Applications are widely known as the building blocks of typical service oriented applications. Performance of such an application system is mainly dependent upon the components of web applications. Testing web application is nothing but to find out errors in its content, function, usability, navigability, performance, capacity, and security. Performance testing is a used to determine the responsiveness, throughput, reliability, and/or scalability of a system under a given workload.

Core Activities of Performance Testing:

- 1) Identify test environment.
- 2) Identify performance test.
- 3) Plan and design tests.
- 4) Configure test environment.
- 5) Implement test design.
- 6) Execute tests.
- 7) Analyze report and retest.

III. SOFTWARE REQUIREMENT ANALYSES

A. Problem Statement

Testing the Web Application using selenium testing with respect to TestNG and generating customized reports for different web Applications on different Browsers.

- 1) *Existing System:* In last few years we are using Selenium tool to test the web application, in this selenium we are not generating the reports directly but we can generate the reports by using third party tool i.e., JUNIT which is interface between web application and selenium tool and it can be used to generate the reports but it cannot support for customized reports and Parallel Testing, Annotations, test cases cannot be grouped to test the web application. In this Project we are propose TestNG tool.
- 2) *Proposed System:* In this project we are proposing third party tool i.e., TestNG to test the web application with different browsers.

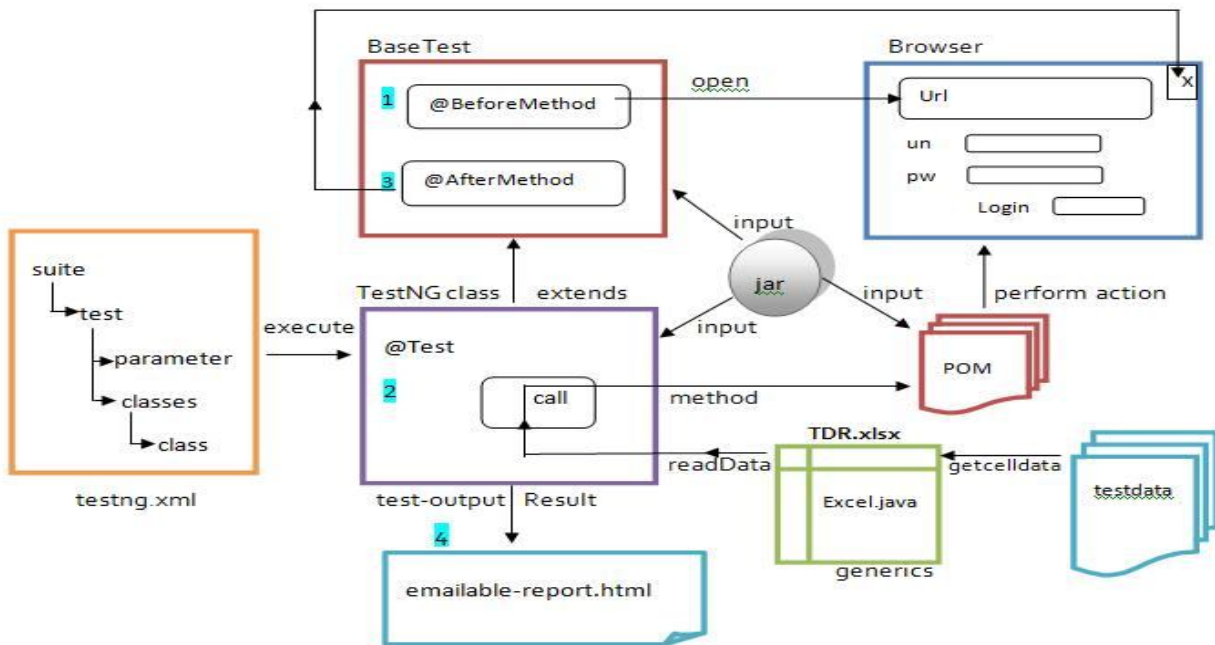
Advantages of Proposed System

- 1) TestNG supports to generate the customized reports.
- 2) Annotations are easier to understand.
- 3) Parallel testing is possible
- 4) Test cases can be grouped and prioritized easily to test the web application
- 5) Generate logs.
- 6) Data parameterization is possible.
- 7) It test the web application on multiple operating systems
- 8) Supports different programming languages to write the test scripts.

B. Objectives

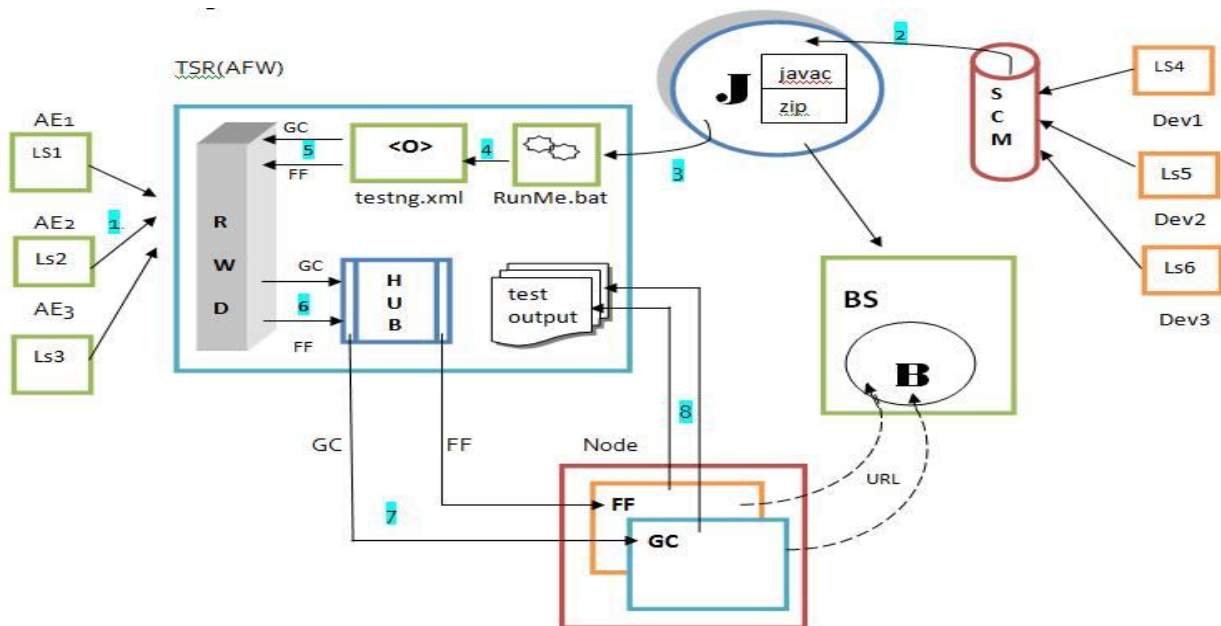
- 1) To generate customized reports using TestNG for different Web Applications on different browsers.
- 2) Compare the reports in JUnit and TestNG.
- 3) The user should use any operating system.

IV. ARCHITECTURE OF THE TestNG FRAMEWORK



- The framework is developed using TestNG, POM and Exel library. It is a combination of Data-Driven and Method-Driven framework, which we call it as Hybrid Framework.
- The execution is controlled by TestNG suite file which has list of TestNG classes which are to be executed.
- Each TestNG class has test method and also extends from BaseTest class which has @BeforeMethod and and @AfterMethod.
- First @BeforeMethod is executed which opens the browser and enters the url. Web Driver driver=new FirefoxDriver(); driver.get("")
- After executing Before Method it will start the execution of testmethod. The testmethod takes the data from excel sheet and performs the action by calling the method present in POM class.ex: String un=Excel.getCellData(xpath,sheet,1,0); LoginPage l=new LoginPage(driver); l.setUserNAme(un)
- After executing testmethod, it will execute AfterMethod which closes the browser. driver.close();

IV. FLOW DIAGRAM



A. Abbreviation Used

- LS - Local System
- AE -Automation Engineer
- TSR > Test Script Repository
- AFW - Automation Framework
- Dev – Developer
- SCM - Software Configuration Management
- J- Jenkins,
- B – Build
- BS- Build Server

B. Steps

- 1) Every day automation engineers will convert manual testcases into Automation scripts and store them in TSR.
- 2) Developer writes code in their local system and stores them in SCM and it is detected by Jenkins which will creates a build and installs it in Build Server.
- 3) After installing the build and it will execute the batch file.
- 4) Batch file will execute TestNg suite file (testng.xml).
- 5) Since the parallel option is specified as **tests** and we have 2 test blocks, it will create two threads: one for chrome and another for firefox browser.
- 6) Since we are using Remote Web Driver class, all the scripts will be sent to hub.
- 7) Hub will forward it to suitable node.
- 8) Scripts will be executed in the node and results will be stored back in the **test-output** folder of framework.

V. RESULTS AND DISCUSSIONS

After executing all the scripts it will generate the result in html format (test-output folder) of the framework.

Test	# Passed	# Skipped	# Failed	Time (ms)	Included Groups	Excluded Groups
Suite						
TestGC	3	0	0	278,656		
TestFF	0	3	0	93,525		
Total	3	3	0	372,181		

VI. CONCLUSION

Testing the Web Application “www.phptravels.com” for different web elements like Login element, Demo element and Order element performed successfully. We have tested login element by giving details via excel sheet and verified whether the details read from excel are valid or invalid. If valid user then user is logged in. If invalid user then user cannot be logged in and displays message incorrect details. We have tested Demo element for hotel listings, tour listings, Special Offers, Blog which contains travel and food details, Adventures and shopping details. We have tested Order element for add product to the cart and also created account successfully in Registration element. Finally, we have generated the customized reports for all the test cases using TestNG and compare the reports generated by TestNG and JUnit.

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