Action Based Keyword Driven Framework for Testing Web Applications

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Abstract

Software development companies rely highly on automated testing and adopt various automated testing frameworks. There is a need to develop a testing framework which should be application independent and scalable. Action based Keyword Driven testing is the solution for above mentioned problems. The idea behind the Action based Keyword Driven approach in automation is to separate the coding from the test case, test step & driver script. Action based keyword-driven test automation framework improves reusability of automated test scripts. Action based KDT framework suite allows manual testers to participate in the automated test creation without any programming knowledge. It also reduces the overall maintenance cost. The proposed framework uses selenium Web Driver API for testing web applications. The test case results are generated as HTML-based reports.

Keywords: Automation, Testing, frameworks, Application independent, Scalable, Action based keyword driven, Web driver, HTML reports

I. INTRODUCTION

Software Development Life Cycle defines (SDLC) the phases in building of software. SDLC consists of various phases. Testing is one of the final phases before the deployment of software/product. Software testing is a process of executing a program or application with the intent of finding the software bugs. It can also be stated as the process of validating and verifying that a software program or application or product (a)Meets the business and technical requirements that guided it’s design and development (b)Works as expected (c) Can be implemented with the same characteristic. Software testing can be done in two ways. They are manual testing and Automation testing. Earlier, Software testing was carried out manually by testers. Manual testing requires more human labour and also time consuming task. Automating the testing process overcomes the pitfalls of manual testing. Automation testing refers to using specially designed software to test software. Software development companies rely highly on automated testing and adopt various automated testing frameworks. The various automation testing frameworks available are Modular testing framework, Data driven testing framework, and Keyword driven testing framework.

II. RELATED WORK

The authors Ajeet Kumar, Chandraprabha, Sajal Saxena [2] in the paper [2] have explained about Data driven testing framework and how it can be implemented for testing web applications. The main disadvantage of this technique is it is application dependant. The test cases and the driver scripts are strongly related, which leads to changing either one requires changing the other. Test cases created are similar and creating new kind of tests requires creating new driver scripts that understands different data. In Data driven testing, it requires great expertise of scripting language, and also a large number of data files for each test case with many inputs.

Thus by inferring, Action based Keyword Driven testing is the solution for above mentioned problems, which is application independent and scalable. The idea behind the Action based Keyword Driven approach in automation is to separate the coding from the test case, test step & driver script[1][3]. The authors Abhishek Jain, Sheetal Sharma[1] described how develop keywords and describes how test cases can be designed and implemented with the help of keyword driven test automation framework. The authors [3] have stated the keyword driven framework approach with an example. [3].
III. PROPOSED METHODOLOGY

Action based keyword driven testing framework selects the keywords for test cases based on the actions performed. An excel sheet is created to store the test details. It contains the test suite id, test case id, the application URL which is going to tested, page, object name, locator type, locator value, keyword and data. Each keyword will be associated with an appropriate function and data. Selenium automation tool is used for the execution of test case. The driver script organizes the test execution and also stores test logs in specified folder/file. A test case contains the test steps and test steps are used to identify the keywords. Microsoft Access is used as the database. It stores all the test related data in table format. The data in excel will be updated in MS Access database regularly.

IV. FRAMEWORK COMPONENTS

Action based keyword-driven framework is an application-independent framework that performs all possible actions and verifications on an object. Hence, the code for the same object can be used across different applications. Action based keyword driven Framework consists of following components.

A. Selenium:
Selenium is an open source automated testing suite for web applications across different browsers and platforms. Selenium 2.0 is used which is the integration of the Web Driver API. Web Driver is designed to provide a simpler, more concise programming interface. Web Driver was developed to better support dynamic web pages where elements of a page may change without the page itself being reloaded.

B. Web Application or AUT:
The web application or web page on which test has to be performed. The URL of the web application is used to identify web page.

C. Driver Script:
The Script that drives the entire execution. It performs prerequisite and initial settings that are required for the execution. The driver script organizes the test execution and also stores test logs in specified folder/file.

D. Test Cases:
A test case is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works correctly. The Test Case contains four different parts. They are Test Step, Object of Test Step, and Action on Test Object, and Data for Test Object.

1) Test Step : Description of the Action going to perform on Test Object
2) Test Object: Name of the Web Page or element, like Username & Password.
3) Action: It is the keyword which will perform action on any object such as click, open browser.
4) Test Data: Data is the value needed by Object to perform any action, like Username value for Username field.

In keyword driven test framework, all the operations and instructions are written in some external file like Excel worksheet.

V. WORKFLOW

![Workflow Diagram](image)
1) Tester initializes the driver script.
2) The Driver script starts the test and connects with the bundle of test cases which is stored in Excel worksheet and start executing one by one.
3) Once Test Case is picked, linked Test steps are followed sequentially.
4) Test Steps are further connected with Page Object & Test Data.
5) Each test step is associated with Action keyword. According to the Action keywords written in Excel file, the framework will perform the operation on AUT.
6) For example, we need to click a button 'Login'. Correspondingly, our Excel will have a keyword 'Click'. Now the AUT can have hundreds of button on a page, to identify a Login button, in Excel we will input Object Name as login Button & object type could be xpath, name css or any other value. Once Driver script gets all the required information to perform a test step, it connects with application and does the step automatically.

![Diagram](image)

**Fig. 2:**

**VI. ADVANTAGES OF ACTION BASED KEYWORD DrIVEN TESTING**

1) It provides a high degree of reusability, where test cases generated can be used to test various web applications.
2) Action based KWD can create flexible, easily maintainable tests faster.
3) This framework helps a non-technical person to understand the automation very well
4) Manual testers to participate in the automated test creation without any programming knowledge.
5) Action based KWD is not dependent on a specific programming language or tool.
6) Easy to read test scripts and to add new test scripts
7) This framework increases user productivity.
8) Test script can be created even when the application is not ready for test.

**VII. CONCLUSION**

Action based keyword driven testing provides an efficient way to test various web applications. It also reduces the overall time taken for testing phase. In this paper the framework implemented and its components are explained in detail. The Workflow of the proposed system is also put into words.
REFERENCES

