Review and Advancement of Automation Testing with Integrated Frameworks

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Abstract— **Real-world prerequisites are wild and flawless Automation Testing algorithms. Presently all applications practice these techniques and obviously all coding created must be tested too. Instantaneous applications do Automation testing where manual intervention is found to be at minimal level. Various tools & techniques that follow distinct Automation Testing intensified procedures and for managing those with integrated frameworks were studied. This manuscript reviews the wide-range of Automation Testing methods used by the various algorithms. This script correspondingly performs learning and assessment of divergent implements for progress of this Automation Testing techniques with integrated frameworks using Python, Integrated Development Environment (IDE) and Application Programming Interface (API) implements. The major prerequisites are catalogue that holds Python Implements that take in IDE, API outfits employed for Automation Testing with Integrated Frameworks.**

Keywords— Automation Testing, Integrated Framework, Application Programming Interface, Integrated Development Environment, Python.

I.   INTRODUCTION

Software testing is a study organized to deliver the participants with evidence concerning the quality of the software creation or package in test.

Manual testing is the process of substantially testing software for shortcomings. It involves a tester to participate in the responsibility of an end user whereby they handle utmost function's attributes to confirm the exact actions.

Automation testing is a Natural testing technique where the tester put the scripts in writing by own and practices appropriate software to assess the software. It is fundamentally an automation procedure of a manual process. Identical to regression testing, Automation testing too used to examine the purpose from load up, carrying out and accent point of view.

Research Objectives The objective beyond Automation is to lessen the quantity of Test Cases to be accomplished manually and, thereby not to eliminate entire Manual Testing.

A framework is determined to be a blend of set protocols, rules, standards and guidelines that can be unified or tracked as a total to influence the reimbursements of the collaboration if by means of the Framework.

Considering a real-life scenario that are manipulated very often. There are a few procedures those are revealed inside and followed taking care off to influence the highest advantage and extended service after the system. Thus, the users might have noticed such guidelines and following them makes the system more beneficial, accessible, scalable and less troubled for the users.

II.   TEST AUTOMATION FRAMEWORK

A platform that is put to make availability for an ultimate situation for the automation test scripts running for the user with innumerable promotions that support them to advance in construction, accomplish and account the automation test scripts proficiently. It is more like a system that has created specifically to automate our tests.

In a very simple language, we can say that a framework [7] is a constructive blend of various guidelines, coding standards, concepts, processes, practices, project hierarchies, modularity, reporting mechanism, test data injections etc. to pillar automation testing. Thus, the user can follow these guidelines while automating application to take advantages of various productive results.

The advantages can be in different forms like the ease of scripting, scalability, modularity, understandability, process definition, re-usability, cost, maintenance etc. Thus, to be able to grab these benefits, developers are advised to use one or more of the Test Automation Framework. [8]

Moreover, the need of a single and standard Test Automation Framework arises when you have a bunch of developers working on the different modules of the same application and when we want to avoid situations where each of the developers implements his/her approach towards automation.

Advantage of Test Automation framework

1.   Code reprocesses
2.   Determined coverage
3.   Regaining setups
4.   Minimum - cost continuation
5.   Negligible manual interference
6.   Undemanding Reportage.

III. CATEGORIES OF TEST AUTOMATION FRAMEWORK

There is a divergent range of Automation Frameworks available nowadays. These frameworks may differ from each other based on their support to different key factors to do automation like reusability, ease of maintenance etc.
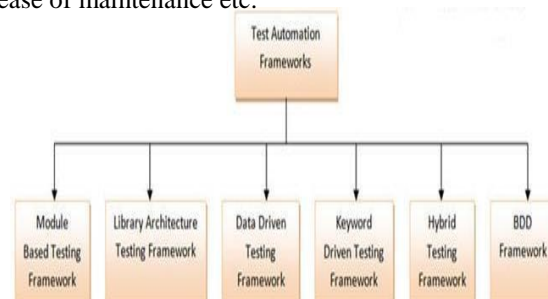

Fig 1 Test Automation Framework

A. Out of few most prevalent Test Automation Frameworks it is most suitable for Keyword Driven Testing Framework

1. Module Based Testing Framework

2. Library Architecture Testing Framework

3. Data Driven Testing Framework

4. Keyword Driven Testing Framework

5. Hybrid Testing Framework

6. Behavior Driven Development Framework

B. Keyword Driven Testing Framework

Is an extension to Data driven Testing Framework in a perceive that it not only separates the test data from the scripts, it also retains some set of code owned by the test script into an exterior data file known as Keywords and henceforth the framework is so termed. Keywords are self-regulatory as to what goings-on want to be completed on the product.

The keywords and the test data are kept in a flat file like structure and thus it is also widely regarded as Table driven Framework. Take a notice that keywords and test data are entities independent of the automation tool being used.
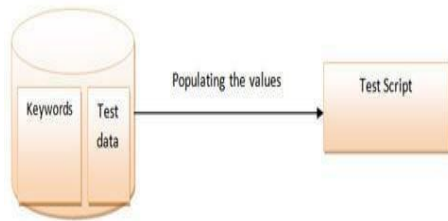

Fig 2 Keyword Driven Testing Framework

Table 1 Example: Test case of Keyword Driven Test Framework

STEP NO	DESCRIPTION	KEYWORD	LOCATOR/DATA
1	Login to application	login	
2	Click on homepage	clickLink	//*[@id='homepage']
3	Verify logged in user	verifyLink	//*[@id='link']

In the above example, keywords like login, clicking and verify Link are defined within the code. Subject to the type of product keywords can be got. And all the keywords are used again numerous times in a single test case. Position finder column holds the locating system value that is used to recognize the web elements on the surface or the test data that must be provided.

All the mandatory keywords are prepared and sited in the root code of the framework.

Advantages:

1. Besides pros given by Data Driven testing, the Keyword driven framework not need the user to have scripting skill, contrasting Data Driven Testing.

2. A solitary keyword can be applied throughout numerous test scripts.

Disadvantages:

1. The user must be sound with the Keyword formation procedure to professionally influence the aids given by the framework.

2. The framework happens to be difficult slowly as it nurtures, a sum of innovative keywords is initiated.

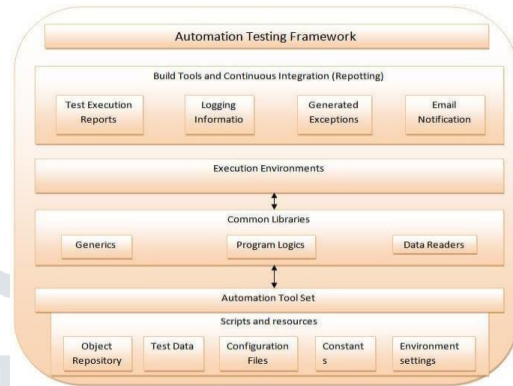**D. Components of Automation TestingFramework**

Fig 3 Components of Automation TestingFramework

Self-explanatory picture yet Underlines the influential facts.

1. Object Repository: Acronym as OR is created of the set of detectors and categories related with web elements.

2. Test Data: The input data with which the state would be tested and is the normal values with which the authentic results would be associated.

3. Configuration File/Constants/ Environment Settings: The file retains the data concerning the application URL, browser-specific evidence etc., mostly stays static all over the framework.

4. Generics/ Program logics/ Readers: Classes that save the roles that is generally employed around the complete framework.

5. Build tools and Continuous Integration: Supports the abilities of the framework to produce test reports, email notifications and logging information.

IV. LITERATURE SURVEY

The objective of this document [1] is to confer the existing and enhanced testing methods for the trustworthy quality assurance resolutions. This script [2] influences the study that embraces hypothetical aspects on numerous software testing techniques, an analysis of dissimilar testing tools and its functioning by captivating hands-on illustrations. Also investigates in what way the test cases are organized and utilized in software application over manual and automation testing. In research [3] Test automation models, Agile practices and tools achieved in Agile test automation works and the type of generic Agile test automation model can be creäted from this working. Regression testing confirms that operations of web applications stays after alterations in the web services. With the purpose to find a basis for the future study in alliance of academia with the industry, an investigation paper on evaluation and assessment

of regression testing methods has been accomplished [4]. This research paper [5] discussed about Automated acceptance testing is current addition to testing in agile software development possessing countless potential of refining interaction and teamwork with the objective to create an advanced synopsis of prevailing information to promote best practices and forthcoming research.

V. INTEGRATED DEVELOPMENT ENVIRONMENT (IDE)

An integrated development environment (IDE) is a software practice that establishes accessible entire resources to computer programmers for software progression. An IDE naturally comprises of a source code editor, form automation tools, and a debugger. Samples of IDE's include PyCharm, Anaconda, Sublime Text, IntelliJ IDEA, Django and PyDev.

With a lot of features that also include Project and code navigation, Python refactoring with web frameworks usingtools such as Django, web2py and Flask, Unified Python debugger, United unit testing, with line-by-line code coverage, Google App Engine Pytho n development, version control integration: unified user interface for Mercurial, Git, Subversion, Perforce and CVS with changelists and merge, tests largely with few other Python-oriented IDEs, together with Eclipse's PyDev, and the additional generally captivated Komodo IDE.[9-29]

With an IDE, it's simple to realize a pictorial design of the location of these documents and come up with further precision for the user.

Advantages of IDEs:

Better Efficiency – earlier coding by reduced endeavors. Collaboration – A team of programmers work in a systematized channel with no tussles in an IDE.

Disadvantages of IDEs:

Firmly limits a programmer when they are neutral in acquisition of knowledge. Broadly they don't need IDE at all, but it infrequently matches life to be relaxed. For advanced programmers IDE is not vital.

V. APPLCATION PROGRAMMING INTERFACES(API)

An application program interface (API) is a set of routines, protocols, and tools for building software applications. Primarily, an API specifies how software mechanisms must interact. Furthermore, functioned with program design graphical user interface (GUI) components. An API is a software intermediate permitting two applications to collaborate with each other. As a substitute, they stress on the extraordinary proposal of their applications whereas distribute out all the product utilities to APIs.

APIs are vivacious tools for businesses in all industries. The status of APIs from a practical attitude, they permit the abilities of one computer program to be used by another. They are a channel by which two dissimilar programs are capable to interconnect.

Advantages: These are used in coding's often, so the programmer need no extra time writing all these

codes another time. Also, they will be interfaced with assembly language for hardware access, so it will be too complex to do all these in a program.

Samples of API's includes Reddit API, Json, Selenium, Robot Framework, TestComplete, Scikit-learn, Statsmodels, Theano, Real Python, Learn Python the Hard Way.

Exploring API Tools open-source machine learning library for Python, built on Tools, used for applications such as natural language processing mostly predictable by Facebook's AI research group, and Uber's "Pyro" software for probabilistic programming is formed on it

VI. CONCLUSION

Various tools & techniques that follow distinct Automation Testing intensified procedures and for managing those with integrated frameworks were studied. A review on various Automation Testing methods and provides knowledge on different tools for promoting this Automation Testing methods by means of Python IDE and API tools. Then design this Automation Testing System using the Python Tools that include prefixed IDE, API Tools.

VII. ACKNOWLEDGMENT

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The vast scale of Knowledge and Reach in the Information Technology Industry has attracted me to join the Computer stream. Hoping to be the best of my Capability and contribute to the respective organization or domain wherever my presence is valued and appreciated.