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Test Automation Framework-A Comparative Study

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Abstract: ***Testing a Software is a crucial part of development life cycle. Every product needs to be tested for its functionality before release to users. Use of automation in such testing activity in the IT industry has led to a convincing improvement in terms of both quality and efficiency of product with decreased manual interruption. Automation framework which is a collection of tools and processes which helps to produce such adaptable automation solutions. This paper work gives a brief introduction on automation framework and its types. We also describe pros and cons related to each of the framework types.***
Keywords: Automation Framework, Manual Testing, Behavior Driven, Data Driven

I. INTRODUCTION TO AUTOMATION FRAMEWORK

A test Automation framework is an integration of hardware and software resources, tools and process, standards and guidelines which provides environment for the development and execution of test scripts. After the development of any product, an investigation is performed by the tester to provide stakeholders information about quality of the product. Basically automation can be defined as a power of machine to control the execution of tests on a product. Automation Testing utilizes specialized testing tools and reduce the human or manual interruption, redundant or repetitive errands. Use of automation in testing saves both time and efforts [2]. Nevertheless, adopting automated testing is not easy and unsuccessful due to a lack of key information and skills [6]. The cost of automating a test is best measured by the number of manual tests prevented from running and the bugs it will therefore caused to miss [7] This paper is organized as follows. Section 2 highlights the benefits and importance of Automation Framework. Section 3 explains Architecture of Automation framework. Section 4 is comparative study of various types of Automation framework with its pros and cons. Section 5 draws conclusion.

II. IMPORTANCE OF AUTOMATION FRAMEWORK IN SOFTWARE TESTING

Automation framework offers a lot of benefits, which forces to use it instead of testing manually [5]. Firstly, we need to know when and what type of activities need to be automated and not to be done manually [1] in testing environment .Conventional testing process that requires human interruption is tedious, non-specialized and wastes useful development time. Automation test produces ground-breaking and adaptable automation solution by [4] utilizing various techniques, apparatuses and yield, decreasing manual mediation .Clearly, the test automated innovation improves the productivity in testing and lessen repetitive work. Following are some of the benefits offered by them.

A. Reuseability

Developed scripts for one test can be reused in other testing activities which saves both time and efforts of writing scripts again.

B. Speed And Efficiency

Each of the framework have their own standard and guideline, which helps in improving productivity also enhances speed of testing.

C. Cost

Developed code can be reused multiple times, cast and time of building new test cases are low.

D. Less Human Iterruption

Since all the procedures are automated using scripts, less or sometimes no manual interruption when test is started.

E. Portability

Most of the frameworks are portable, which means it can be easily deployable in any environment

F. Scalability

Whenever there is new feature, framework allows easy addition of those scenarios while testing.

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III. ARCHITRECTURE OF AUTOMATION FRAMEWORK

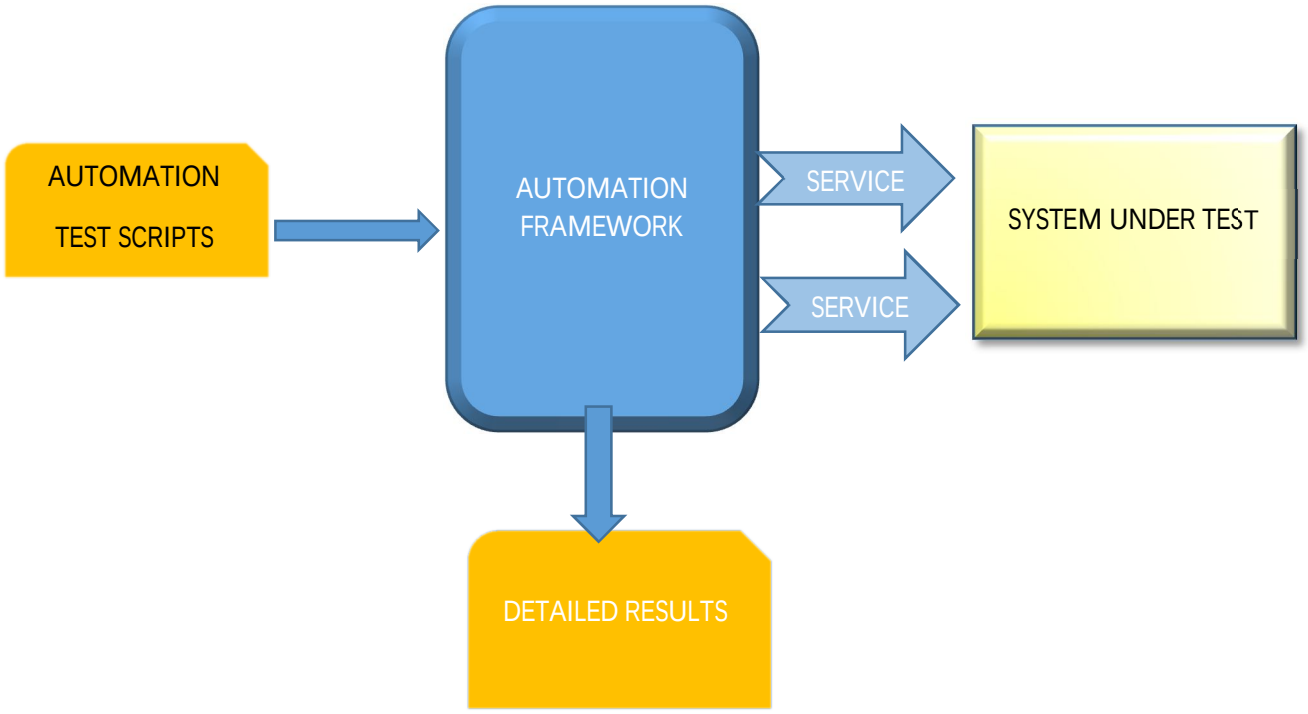


Figure 1. Architecture of Automation Framework

Identifying the features to be tested, collecting information and writing scripts accordingly is the first task of testing. Later test execution is begun from the command line. Some of the IDE's like eclipse provide an option to execute the test case directly without using CL. At the point when execution is begun, the framework initially parses the information. Interaction with target system under test is handled by test libraries. Some framework offers several standard libraries that which provides actual testing capabilities during testing by providing keywords [4]. A detailed result of testing will be produced by the framework. Some of the frameworks like Robot produces log report after execution.

IV. TYPES OF AUTOMATION FRAMEWORK

A. Linear Test Automation Framework

A simple Record and Playback Framework, where an individual records all steps of testing manually. It can be used for testing small applications. Since it is a record and playback, all the data are hard coded and tests cannot be reused. Any individual can understand and perform testing, no high coding skills required.

B. Modular Test Automation Framework

It is based on popular OOP concept called Abstraction, it divides system under test into various modules. Test scripts are written separately for each of the module, so changes made to one module does not affect the testing of other part. Modularization leads to a cost effective and easier maintenance. A significant amount of time is wasted whenever there is a need for change in test data.

C. Behavior Driven Test Automation Framework

Allows the development of easily readable and understandable test automations. In BDD, we can use natural language to create test specifications. Prior experience and technical skills are required. Cucumber, Jbehave are some of the examples

D. Data Driven Test Automation Framework

A different amount of test data in the form of a file can be passed to the test case to test the application for variety of data. These files are loaded as a variable in the test script. All these data can be stored in an external drive. Tester requires high coding skills to completely understand and work with this type of framework

E. Keyword Driven Test Automation Framework

Keyword driven testing, test scripts are executed at higher level of abstraction. Robot framework is one such test automation framework which is technology independent for acceptance test-driven development (ATDD).It is an extension of data driven approach, where along with data, it also keeps a set of codes used by the test scripts in separate file. Does not require much coding skills, since tester can use directly available keywords.

F. Hybrid Testing Framework

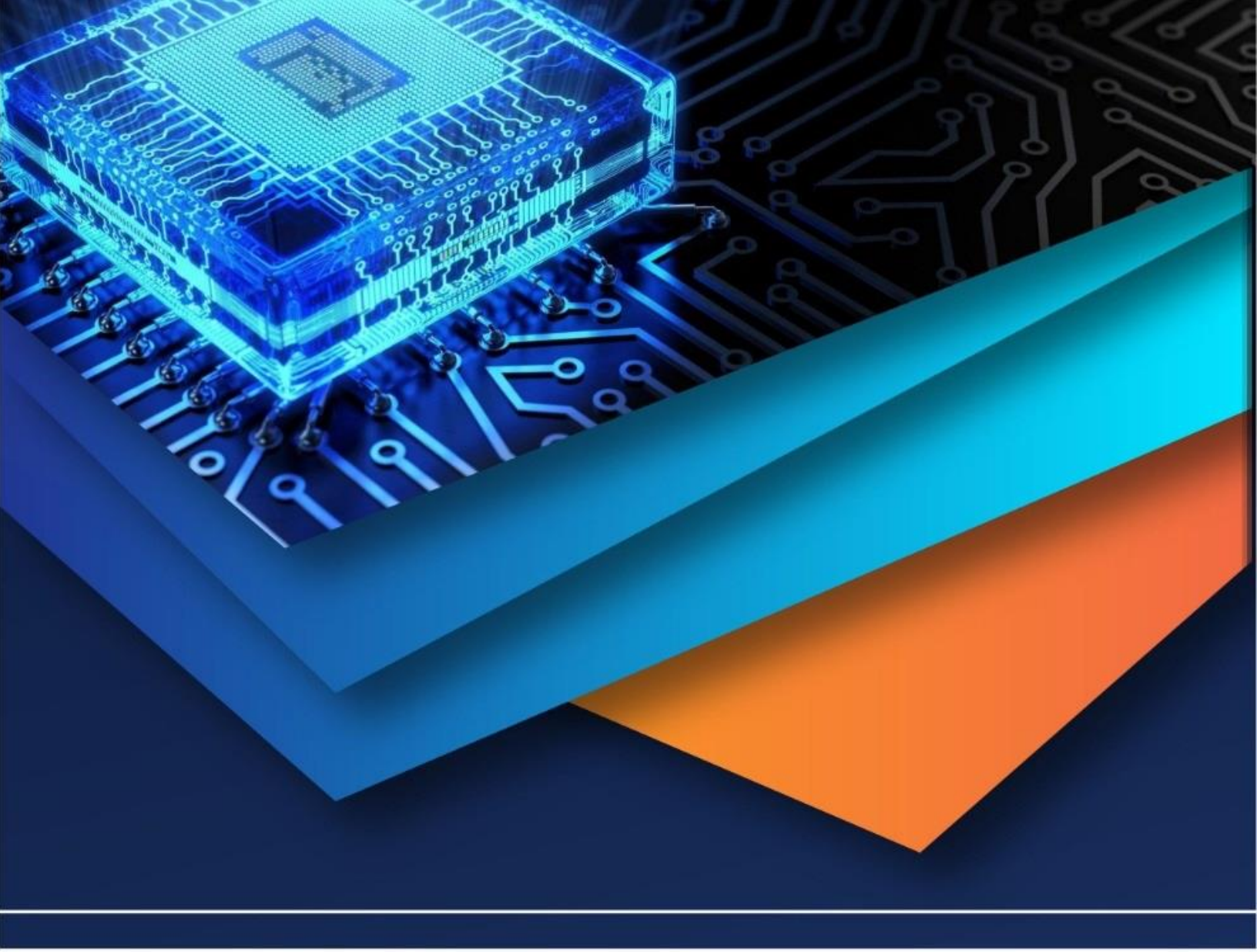
A combination of all the above mentioned framework, taking advantage of existing framework benefits to perform automation. High skills and understanding of all frameworks is required. Example can be combination of Data and keyword Driven framework.

V. CONCLUSION

In todays development environment , use of Automation framework has become any integral part which leads to immense benefit for the companies.In this paper we describe how automation benefits testing activities. We also described various types of framework that can be used depending on the requirement. In the period of regular refreshing rendition of programming, repeatability of task irritates the test staff, computerization test procedure can be performed without wasting much of tester's time. Also, testing staff can utilize these free time to perform other useful activities.

REFERENCES

[1] Eberhardinger B, Habermaier A, and Reif W "Toward Adaptive, Self-Aware Test Automation." IEEE/ACM 12th International Workshop on Automation of Software Testing (AST). (2017)
[2] Kumar D & Mishra, K. K "The Impacts of Test Automation on Software's Cost, Quality and Time to Market" ,Procedia Computer Science. (2016).
[3] Louise Tamres, Translator: Bao XiaoLu, Wang XiaoJuan, Zhu GuoPing Software Testing. Posts & Telecom press(2004) pp.20- 26.
[4] Jan-Ping L, Juan-Juan L, and Dong-Long W "Application Analysis of Automated Testing Framework Based on Robot" Third International Conference on Networking and Distributed Computing. (2012)
[5] A. Cervantes, "Exploring the use of a test automation framework," IEEE Aerospace conference, 2009
[6] Kim, E. H. Na, J. C. & Ryoo, S. M "Implementing an Effective Test Automation Framework" 33rd Annual IEEE International Computer Software and Applications Conference(2009).
[7] B.Marick, "When Should a Test Be Automated?" Proc.11th Intel Software/Internet Quality Week, May 1998



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