Impact Factor (SJIF): 3.632

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

(Special Issue for ITECE 2016)

A Review On: Manual Vs. Automated Testing

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Abstract—In Software Development Process, Testing is a very important part. It is to verify & change source code. High quality software produces by Effective Testing. Testing can be done mainly by manually as well as Automated. These two approaches are complementary of each other: automated testing can perform a more number of tests in less time, whereas manual testing uses the knowledge of the testing engineer to target testing to the parts of the system. In this paper we describe advantages and disadvantages of manual and automated testing. Manual testing is a base of automated testing.

Keywords: Software Testing, manual testing, automated testing

I. INTRODUCTION

With a manual testing, the more traditional approach, testers prepare test cases that they think will best exercise the code. An automated testing tries to remove the tediousness of the process by relying on a software tool that generates test cases from the program's specification or its actual text .Software automated testing is the process of executing a code with the intention of finding errors in the program. It is the process of exercising or evaluating a system or system components by manual. Automatic means to verify that it satisfies basic requirements or to identify differences between expected and actual results [1], [2] Software Testing should not be a distinct phase in System development but should be applicable throughout the design ,development and maintenance phases. "Software testing is often used in association with terms verification & validation" [3].

II. TESTING STRATEGIES

In this section we introduce the two strategies: manual and automated

2.1 Manual Testing Scenario

Manual unit testing has established itself as an integral part in modern software development.

2.1.1 How is manual Software Testing Done?

Unit Testing This is a first stage in testing normally carried out by the developer who wrote the code and sometimes by a peer using the white box testing technique.

Integration Testing There is two modes in this, as a complete package or as an increment to the earlier package. Mostly black box testing technique is used. But, sometimes a combination of Black and White box testing is also used.

System Testing In this the software is tested from all possible dimensions for all intended purposes and platforms. Black box testing technique is normally used in this.

User Acceptance Testing This testing stage carried out in order to get customer sign-off of finished product. If 'pass' in this stage then it ensures that the customer has accepted the software and is ready for its use.

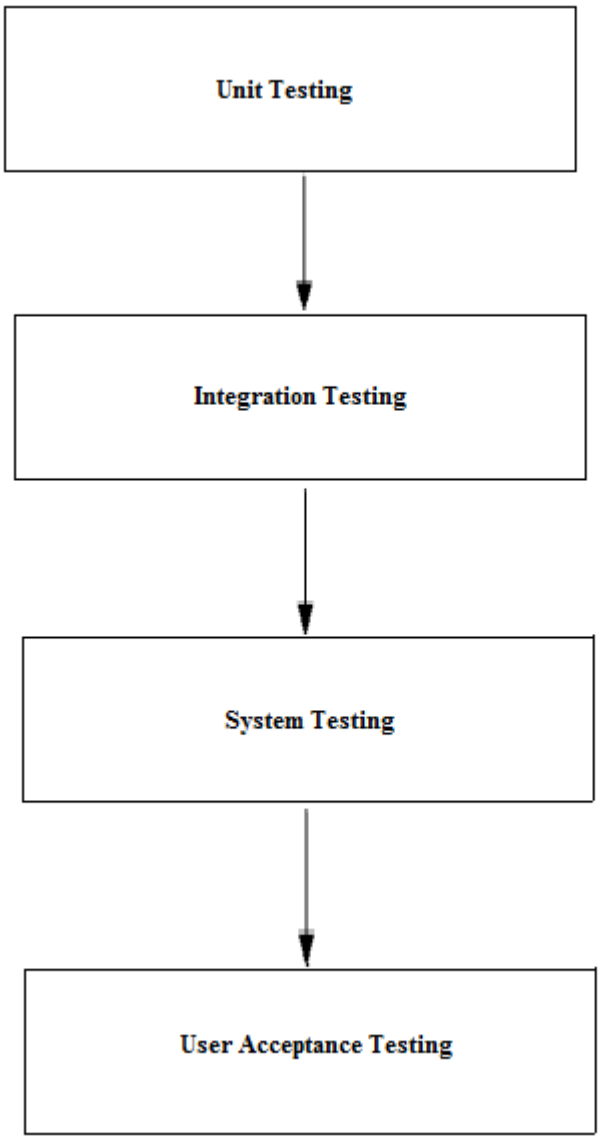

Figure-1. Manual Testing Process Life Cycle Diagram

2.2. Automated Testing

Automated tests execute a sequence of actions without human intervention. It is also defined as a testing a system with different data sets again without intervention of human. Simply automated testing is automating the manual testing process currently in use.

2.2.1 How is Automated Software Testing Done?

Automation of software testing is similar to a software development process .It goes through the same life cycle as in the development of software product .The important think is who is writing the scripts. There is always a

conflict on who writes the scripts whether a developer or a testing team member. It is always a good idea and normally followed by many organizations that the effort should be a combine effort between tester and the developer. The automation process goes through a lot of effort taking collaborated work because a lot of emphasis is given for the time and financial constraint .The automation process may be divided into many phases but as a whole in general perspective it goes through the following phases in

1. Finalization of test automation and making a test plan
2. Selection of tool and customization
3. Development and testing scripts
4. Testing using automated test scripts

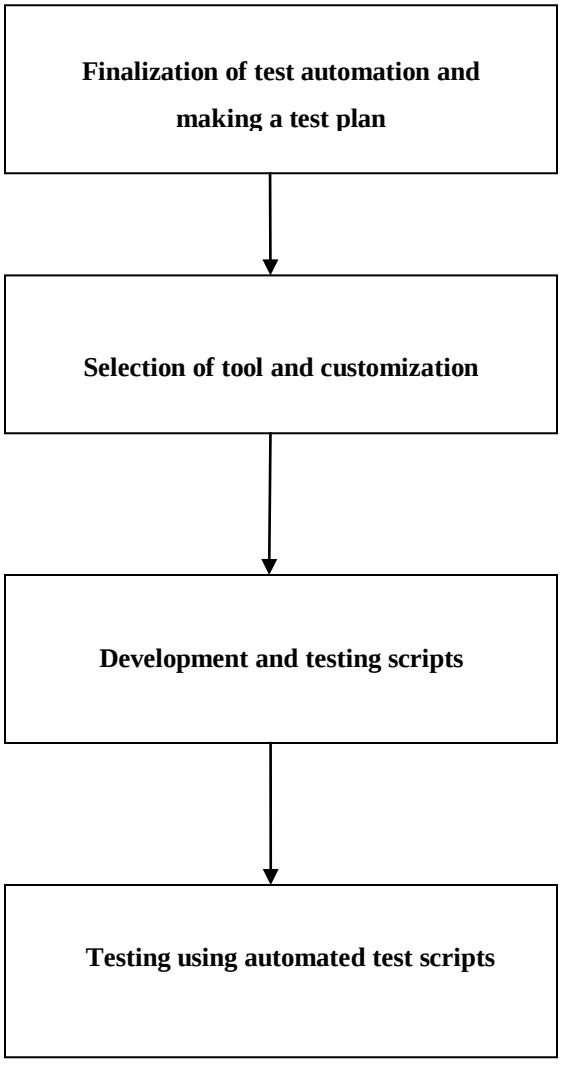

Figure-2. Automation Process Life Cycle Diagram

III. PROBLEM WITH MANUAL TESTING

- Manual Testing is time consuming.
- People generally neglect running manual tests.
- In a typical manual test it is very difficult to test a single unit.
- Manual Testing is not reusable.
- The effort required is the same each time.
- Scripting facilities are not in manual testing.[4]
- Manual Tests provide limited Visibility so that only the developer testing the code can see the results.
- Tests have to be repeated by each stakeholder for e.g. Developer, Tech Lead , GM, and Management.
- Manual Testing ends up being an Integration Test.

IV. PROPOSED AUTOMATED TESTED

Automated testing with Quick Test addresses are dramatically speeding up the testing process. You can create tests that check all requirements of your application or Web site, and then run tests every time your site or application changes.

4.1Fast: Quick test runs tests significantly faster than human user.

4.2Reliable: Tests perform precisely the same operations each time they are run, thereby eliminating human error.

4.3Programmable: You can program sophisticated tests that bring out hidden information.

4.4Comprehensive: you can build a suite of tests that covers every feature in your web site or application.

4.5 Reusable: You can build a suite of tests that covers every feature in your website or application.

V. DIFFERENCES BETWEEN MANUAL TESTING AND AUTOMATION TESTING

Table 1. Manual vs. Automation testing

Manual Testing	Automation Testing
Manual Testing is a process which is done manually.	Automation Testing is a process which is done by the help of automated tools.
All the famous phases of STLC like test planning, test deployment, result analysis, test execution, bug tracking and reporting tools are obviously comes under the category of Manual Testing and done successfully by human efforts.	In Automation Testing all the popular phases of STLC are done by various open sources and purchased tools like Selenium, J meter, QTP, Load Runner, Win Runner and so on.
Manual Testing is a start of Testing, without this testing we can't start Automation Testing.	Automation Testing is a continuous part of Manual Testing.
In Manual Testing testers are allowed to do Random Testing to find the Bugs.	In Automation Testing we always test through Running Scripts.
In Manual Testing we find more bugs than automation by Error Guessing.	In Automation Testing we test the repetitive functionalities of the application.
It takes lot of time.	It takes less time.
Manual Testing would be run sequentially.	Automation Testing is done on different machines at same time.

Regression Testing process is tough in Manual Testing	Regression Testing process is easy in Automation Testing by Tools.
It is not expensive.	It is expensive.
More testers are required in Manual Testing because in this testing test cases need to be executed manually.	Few testers are required in Automation Testing because in this testing test cases need to be executed by using Automation Tools.
It gives low accuracy result.	It gives high accuracy result.
It is considered as low quality.	It is considered as high quality.
In this Testing we cannot do batch testing.	In this Testing we can do multiple types of batch testing.
It is considered as less reliable.	It is considered as more reliable.
No need of programming in Manual Testing.	Need of programming is must in Automation Testing.
It is done without interaction of any Tool.	It is always done using tools.

VI. ADVANTAGES AND DISADVANTAGES

5.1 The Advantages of using Manual Testing are:-

- Manual testing is cost effective as compared with Automation testing.
- It allows the tester to perform more Ad-hoc testing (random testing). More bugs are found via Ad-hoc testing than via automation. And the more time a tester spends playing with the feature, more bugs can be found.
- One major advantage of manual testing is this: Since a person thinks, therefore, the tester will find ways and means on how to best explore the product aside from the pre-set ways presented to him/her. In short, a person can do exploratory or monkey testing.
- Manual testing can be used for both small and big projects.
- We can easily add and remove the test cases according to project movements.
- Fresh tester can understand very easily the process of manual testing.
- Manual testing is more reliable than automation testing (in many cases automated not cover all cases).
- Manual testing is not related with any programming languages.
- It is covered in limited cost.

5.2 The Disadvantages of using Manual Testing are:-

- Manual testing can be very time consuming as everything has to be done manually
- More human involvement.
- In manual testing, the concept of repeatability not so accurate.
- GUI object size difference and color combination etc is not easy to find out in manual testing.
- Actual load and performance is not possible to cover in manual testing for large number of users.
- Running test manually is very time consuming job.

5.3 The Advantages of using Automation Testing are:-

- Once test scripts are written and added to test suite they cannot be forgotten where tester can forget to perform some specific tests. Also automated tests are more accurate than manual tests as they do not involve human errors.
- It reduces human and technical risks.
- If the developer team changes automated test scripts will help them reuse the previously developed tests and thus reduce the risks.
- It is more powerful and flexible using manual testing we cannot create 100 virtual users at a time which can be done by using automated testing. Also the test scripts can be reused. [5]
- It is faster than the manual testing
- The same test case (record and replay) can be re-executed using testing tools.
- Test suits can be re-used on different versions of the software.
- Testers can program sophisticated tests that bring hidden information.
- Testers can build test suites of tests that cover every feature in software application.
- Automation tests perform precisely same operation each time they are run.

5.4 The Disadvantages of using Automation Testing are:-

- The automation tools can be an expensive purchase. As a result, it is important to only use the ones that will give you full, or as close to full coverage, as you can find.
- While the automation process cuts down on the time it takes to test everything by hand, automated testing is still a time intensive process. A considerable amount of time goes into developing the automated tests and letting them run. For example, a large client of ours ran into trouble when their daily run of automated tests exceeded the 24-hour mark.
- While automated tests will detect most bugs in your system, there are limitations. For example, the automated tools can't test for visual considerations like image color or font size. Changes in these can only be detected by manual testing, which means that not all testing can be done with automatic tools.

VII. CONCLUSION

This paper proposed the comparison of manual and automated testing. One of the main goals of this work is to understand the importance of software testing. Manual testing is extremely important crucial for testing software applications more thoroughly. Manual testing is always a part of any testing effort. Automated Software testing is the best way to increase the effectiveness, efficiency and coverage of software testing. Test automation is expensive and it is an addition, not a replacement, to manual testing.

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