A SURVEY ON SOFTWARE TESTING PRACTICES

Mahima Pauline R
USN: 1BM13IS033, Department of ISE, BMS College of Engineering, Bangalore, India

ABSTRACT

Software testing is an important part of software development life cycle. To develop high-quality software, it is essential to use software testing methods and tools (STMTs) effectively and efficiently. There exists different types of software testing and also there exists various methods and tools for testing. This paper provides a survey on various software testing methods.

Keyword: *Software testing, Manual Testing, Automated regression testing.*

---

1. INTRODUCTION

Software testing methods are techniques, procedures, patterns or templates used to conduct software testing tasks effectively and efficiently. Examples include metric-based approaches for test estimation, black-box or white-box techniques for test design, static testing techniques and so on. Software testing tools are software products that provide automated or semi-automated support for software testing methods and processes, such as tools for dynamic analysis, coverage analysis and test design. Software testing tools are developed to support particular software testing methods and automate the methods fully or partially.

Software testing is the procedure of assessment a product thing to identify contrasts between given information and expected yield. Likewise to evaluate the component of A product thing. Testing evaluates the nature of the item. Software testing is a procedure that ought to be done amid the improvement procedure.

Verification: It is the procedure to ensure the item fulfills the conditions forced toward the begin of the advancement stage. At the end of the day, to ensure the item carries on the way we need it to.

Validation: It is the procedure to ensure the item fulfills the predefined necessities toward the finish of the advancement stage. At the end of the day, to ensure the item is worked according to client prerequisites.

There are many types of testing like:

- **Unit Testing:** In unit testing individual units are tested and it comes under white box testing. After the development of application unit testing is done to give the expected results. It is the first phase among all the testing.
- **Integration Testing:** After unit testing is done to all the modules they are gathered and joined. All the modules are integrated and are tested as a whole. It comes under white box and black box testing.
- **Functional Testing:** In functional testing the functions of individual models are checked. They are checked if their functionality works properly. It comes under white box testing
- **System Testing:** When the software is out into various environment and testing is done it is all system testing. The different environment can be something like different Operating system etc. The system as whole is tested and it comes under black box testing.
- **Stress Testing:** In stress testing it is checked to assess how framework acts under horrible conditions. Testing is directed at past cutoff points of the details. It falls under the class of discovery testing.
- **Performance Testing:** It is the testing to survey the speed and adequacy of the framework and to ensure it is creating comes about inside a predefined time as in execution necessities. It falls under the class of discovery testing.

- **Usability Testing:** It is performed to the viewpoint of the customer, to assess how the GUI is easy to understand? How effectively can the customer learn? Subsequent to figuring out how to utilize, how capably can the customer perform? How satisfying is it to utilize its plan? This falls under the class of discovery testing.
- **Acceptance Testing:** It is regularly done by the client to guarantee that the conveyed item meets the necessities and fills in as the client anticipated. It falls under the class of discovery testing.
- **Regression Testing:**It is the testing after adjustment of a framework, segment, or a gathering of related units to guarantee that the alteration is working accurately and is not harming or forcing different
- **Beta Testing.:**It is the testing which is finished by end clients, a group outside advancement, or openly discharging full pre-adaptation of the item which is known as beta form. The point of beta testing is to cover sudden blunders. It falls under the class of discovery testing.

2. MANUAL TESTING: TRADITIONAL APPROACH

Manual testing is the process of testing in which the errors are detected manually. A tester is played the role of user and uses many application features to check for the correctness. To ensure correctness of testing the test plan needs to be followed.

The most used testing type is manual testing. It is the oldest and takes a lot of labor effort and is time consuming. Normally in my companies testing is done manually. After a certain period various test cases are developed for every feature.

2.1 Disadvantages of manual testing

- It is costly in terms of labor and time.
- Manual testing can be slow and tiring- nobody can perform the same process again and again. Hence the testing team experiences lot of problems with this procedures , and mistakes will mostly happen.
- GUI items estimate contrast and shading blend and so forth is difficult to discover in manual testing.
- Load testing and execution testing is not possible in manual testing.
- Running test physically is very lengthy process.

3. AUTOMATION REGRESSION

Automation regression testing is done to check the software which was already developed and tested. If the software performs the same way even after the changes are done. The changes done can be modification of software, enhancements, patches and other changes. .Regression is done to ensure that the new change introduced does not have any errors. The reason of doing regression is to check if the part that is changed in the software affects the others.

The methods present in regression testing include re-running previously completed tests and checks whether program behavior has changed and whether previously fixed faults have re-emerged.

Smoke Testing, proves that non exhaustive modules work properly . The output of this smoke testing are used to decide if the build is perfect. Smoke testing came to software testing from a same type of hardware testing, in which the device passed the test if it did not get burnt the first time it was on.

3.1 Advantages of Automation Regression

- Quick: Runs tests fundamentally quicker clients.
- Analyzers can test how the site or programming responds after rehashed execution of a similar operation.
- Reusable: Tests can be re-utilized on various adaptations of the product.

- Solid: Tests perform absolutely a similar operation each time they are run accordingly taking out human blunder.
- Extensive: Analyzers can assemble test suites of tests that covers each element in programming application.
- Programmable: Analyzers can program complex tests that bring concealed data.

4. SURVEY ON VARIOUS TESTING TOOLS

Programming testing is a standout amongst the most vital periods of Software Development Life Cycle and fundamental strategy to discover bugs and guarantee nature of the product. Programming Testing can be led physically and additionally mechanized. In manual testing, testing is managed with no device. In mechanization testing, testing is finished with the assistance of computerized testing instruments. These mechanized testing instruments empower designers and analyzers to effectively robotize the whole procedure of testing in programming advancement. There is wide assortment of programming robotized testing devices accessible in market. In any case, it is essential to a client to choose a best appropriate instrument for testing. This exploration paper gives a practicality concentrate in view of various parameters for business instruments, for example, the Selenium, SoapUI and open source computerization testing devices i.e. HP Unified Functional Testing (UFT), TestComplete (TC), helping engineers or clients to pick the appropriate apparatus in light of their necessities. The target of this paper is to break down the elements bolstered by these four practical testing instruments that guide in limiting the assets in script upkeep and expanding productivity for script reuse. [2].

In the paper, the product computerized testing instrument QTP (Quick Test proficient) and its detail work stream of utilization is depicted. The paper talked about the utilization of information driven testing in QTP principally and a few cases by and by, including Data table parameters, Action parameters and Environment parameters, and so on. [3]

Selenium is a web application testing apparatus and furthermore it is an open source freeware. This mechanization testing system has increased wide acknowledgment as a prevalent and effective method of site robotized testing in a brief span traverse. These apparatuses are broadly utilized for testing graphical UI and usefulness of electronic applications created for a wide range of businesses, for example, web based business, travel, biotech, pharmaceuticals, and other motorization. This testing freeware renders a savvy way which is an open source testing system for execution and different parameters to find out similarity, precision, viewpoint and utilization of web applications. This paper we studied on the different segments of Selenium, for example, Selenium IDE, Selenium RC, Selenium WebDriver, Selenium Grid Most normally utilized orders and correlation with QTP. [4]

Application lifecycle administration (ALM) incorporates the lifecycle work processes, for example, necessities administration, design, coding, testing, following, and discharge administration. Prepare automation and consistent follow capacity over the procedure are so imperative. In any case, unique phrasing and distinctive model were utilized to execute the device for particular work process with the goal that it is impractical to convey between the devices. In this paper, we recommend new way to deal with accomplish the consistent follow capacity and process automation. For these components, information formalization is basic. Prove based pharmaceutical is great reference design to ALM2. Programming Engineering cosmology is intense answer for semantic hole amongst instruments and rule based process execution condition can be reasonable answer for process computerization. In this paper, we propose the design for computerizing the ALM utilizing process administration innovation and rule based building. [5]

In the field of programming building, distinctive applications have been created. An application requires changes because of changes in the client prerequisites. Regression testing must be performed for the approval of information alteration. Different experiments must be created to play out the regression testing. In this paper, different experiment prioritization procedures have been examined for the era of need of test suites and regression testing approaches give data about which methodologies must be taken after or not. [6]

This paper covers the significance of execution testing of Web applications and dissecting the application's bottleneck in view of equipment, programming and asset usage. Principally, the concentration would be to execution

test the application on various parameters like load, stress, versatility, dependability, security and limit front. Presently a days everybody anticipates that everything will be quick yet in the meantime unwavering quality and these causes the client likewise to push for the execution testing of the application. Execution testing decide how quick a few parts of the framework performs under a pre-characterized workload which is figured by investigating the creation logs which originates from the application facilitated on the servers and knowing the hits amid the business hours knowing a what time business is at its pinnacle. [7]

TortoiseSVN is a free open-source customer for the Subversion form control framework. That is, TortoiseSVN oversees documents and catalogs after some time. Records are put away in a focal store. The store is much similar to a normal document server, with the exception of that it recollects each change at any point made to your records and registries. This enables you to recuperate more established variants of your documents and analyze the historical backdrop of how and when your information changed, and who transformed it. This is the reason many individuals consider Subversion and form control frameworks when all is said in done as a kind of "time machine". Some variant control frameworks are additionally programming setup administration (SCM) frameworks. These frameworks are particularly custom fitted to oversee trees of source code, and have many components that are particular to programming improvement -, for example, locally understanding programming dialects, or providing devices for building programming. Subversion, be that as it may, is not one of these frameworks; it is a general framework that can be utilized to deal with any accumulation of records, including source code. [8]

The motivation behind regression testing is to guarantee that progressions made to programming, for example, including new components or altering existing elements, have not antagonistically influenced elements of the product that ought not change. Regression testing is generally performed by running a few, or all, of the experiments made to test adjustments in past forms of the product. Numerous methods have been accounted for on the best way to choose regression tests so that the quantity of experiments does not become too vast as the product advances. Our proposed crossover strategy consolidates alteration, minimization and prioritization-based choice utilizing a rundown of source code changes and the execution follows from experiments keep running on past forms. This strategy tries to recognize an agent subset of all experiments that may bring about various yield conduct on the new programming form. We report our involvement with an instrument called ATAC which actualizes this method. [9]

Regression testing is an exorbitant yet pivotal issue in programming improvement. Both the exploration group and the business have given careful consideration to this issue. Be that as it may, are the issues they concerned the same? The paper attempt to do the review of ebb and flow examine on regression testing and current practice in industry and furthermore attempt to see if there are holes between them. The perceptions demonstrate that albeit a few issues are concerned both by the exploration group and the business gay, there exists holes. Regression testing will be trying that a program has not regression, that is, the functionalities that were working in the past rendition are as yet working in the new form. Amid the upkeep of a product framework or as the product develops, the regression testing is the costly yet unquestionably important errand. Since the cost of the product upkeep represent around 66% of the entire programming, both venture supervisors and analysts need to give careful consideration to the regression testing. There have been a considerable measure of looks into on regression testing. Since regression testing is very costly, the looks into mostly concentrate on the most proficient method to lessen such cost. The themes incorporate test choice, minimization, prioritization, and so forth [10]

5. CONCLUSION

Software testing is the very important aspect of software development life cycle. This Paper clearly depicts the limitations of manual testing and advantages of automation regression technique. Description Various tools available are clearly specified.

6. ACKNOWLEDGEMENT

I thank Prof. Abhijith H V, Assistant Professor, Dept. of ISE, BMSCE for his constant guidance, useful inputs and motivation.

7. REFERENCES

[1] Meenu, Yogesh Kumar, “Comparative Study of Automated Testing Tools: Selenium, SoapUI, HP Unified Functional Testing and Test Complete”, 2015.

[2] Xinbian Wang, Guangjun He, “The research of data-driven testing based on QTP,” 9th International Conference on Computer Science & Education (ICCSE), 2014.

[3] Jagannatha, Niranjanamurthy, Manushree, Chaitra, "Comparative Study on Automation Testing using Selenium Testing Framework and QTP," IJCSMC, Vol. 3, Issue. 10, pp. 258 – 267, October 2014.
[4] Jeong Ah Kim, Seung Young Choi, Sun Myung Hwang, "Process & Evidence Enable to Automate ALM (Application Lifecycle Management)", Ninth IEEE International Symposium on Parallel and Distributed Processing with Applications Workshops (ISPAW), 2011.
[5] Jaspreet Singh Rajal, Shivani Sharma, "A Review on Various Techniques for Regression Testing and Test Case Prioritization", International Journal of Computer Applications (0975 – 8887) Volume 116 – No. 16, April 2015.
[6] Khan, Rijwan, and Mohd Amjad. "Smoke testing of web application based on ALM tool." In Computing, Communication and Automation (ICCCA), 2016 International Conference on, pp. 862-866. IEEE, 2016.
[7] Küng, Stefan, Lübbe Onken, and Simon Large. "A Subversion client for Windows Version 1.6. 16.", W. Eric Wong, J. R. Horgan, Saul London, Hira Agrawal, "A Study of Effective Regression Testing in Practice", Bell Communications Research, 2011.
[8] Meena Mehta, "A Complete Analysis of Test Choice and Efficient Regression Testing", International Journal of Information Technology and Management, 2016.