Special Issue of Engineering and Scientific International Journal (ESIJ)
Technical Seminar & Report Writing - Master of Computer Applications - S. A. Engineering College (TSRW-MCA-SAEC) - May 2016
ISSN 2394-187(Online)
ISSN 2394-7179 (Print)

Tools and Techniques of Software Testing

D.Rohini[#1], R.Anitha[*2]

[1]*Master of Computer Applications, S.A. Engineering college, Chennai-77.*
rohinimca10091994@gmail.com
[2]*Asst. Prof., Department of Computer Applications, S.A. Engineering College, Chennai-77.*
anitha@saec.ac.in

Abstract— The software testing is an important concept in software engineering process. The software testing is the task of executing a program with an aim of finding errors, so that we get zero defect software. In this paper the tools and techniques of software testing are discussed. Software testing tools may be manual or automated. An automated tool takes lesser time than manual tools. Some of the automated tools are seen, in which selenium tool doesn't have proper documentation. So it is made possible in this paper.

Keywords—Software Testing; Software Quality; Verification; Validation; Manual and Automated Testing.

1. Introduction

Now As we are human beings we certainly make mistakes without our knowledge so we need a work of software testing.software testing is a challenging activity in which it should show only presence of bugs and never to show their absence.software testing is an important component of SQC-software quality control and SQA-software quality assurance. SQC is a control of products and SQA is a control of process.the main goal of software testing is it verifies and validates whether the program is working correctly or not.

Validation - validation is a task of predicting correspondence that is how well the distributed system should match the system necessity. In validation we ask a question,

Verification - is a chore of implements rightness that is it ensures all roles is performance correctly or not. In verification we request a query to check the construction is right or not.

2. Software Testing Methods

- Black box testing(behaviourtesting) is also known as interior (or) functional testing in which internals are not visible and use to check the functionality of the system.
- White box testing(glass box testing) is also known as exterior (or) structural testing in which internals are visible and use to check the performance of the system[1].

3. Levels of Software Testing

- Unit testing -in unit testing, each and every module is tested individually.
- Integration testing -the modules are integrated and tested level by level in integration testing.
- Acceptance testing - in acceptance testing, the testing is done on developer side (or) customer side If it is on the developer side it is said to be alpha testing. If it is on the customer side then it is said to be beta testing.
- System testing - in system testing, an entire system is tested as a whole[2].

The two potential goals for software testing are fault removal and good quality.

Software reliability –is major feature in software testing. This is the likelihood that the software will realize devoid of stoppage in a agreed situation in a specified epoch of instance [3].An guesstimate of consistency is agreed by,

$$R = 1-f/n$$

Where, r = software reliability.
f =no. Of test inputs that have failed.
n = number of test cases.

Software testing research is the driven element of development and application. It laid the foundation for boosting the development. Some of the software tools are planning tool, testing tool, designing tool, testing management tool etc.[4].

Software testing is done under exact conditions for validation and verification. Quality is the main focus of any software project. Lack of calculating we can't be certain of the stage of excellence in software. So, the processes of computing eminence are software testing methods. Software testing research is the driving element of development and an application.[5] software testing can be of manual testing or automated testing. The manual testing is nothing but a normal testing whereas automated testing is done by some automated tools.

4. Automated Tools

Ranorex is an automated testing tool, which is used in desktop, web, mobile applications. it is coded in pure.net code and provides the ability to do test automation in client's own environment. *Rft* – rational functional tester is a tool for object oriented programming and it enables

ISSN 2394-187(Online)
ISSN 2394-7179 (Print)

regression testing. *Janova* tool is used in cloud based software that has easy navigation to homepage. It doesn't require any scripting languages it can be written in english language itself. *Selenium* is the most powerful freeware of open source automation tool. It works for browser based web application. It is platform independent that is it works under multiple platforms such as windows, linux etc. It supports many scripting languages such as java, python, rubyetc. Selenium based testing is used in iphone, blackberry phone etc.

Fig.1: Selenium Tool

4.1 Advantages of Automated Tools

Self-checking ie;needs no human interpretation. Roust ie;not affected by changes in an external environment. Concise ie; simple as possible. Repeatableie;can run many times without human intervention.

4.2 Disadvantages of Automated Tools

Proficiency is required to write the test maintenance is difficult if the test script tests more screens.

5. Methodology

The waterfall model is also stated to as a linear-sequential model. Here, anoutcome of one phase acts as an input for the next phase consecutively. There is no overlapping in the phases.

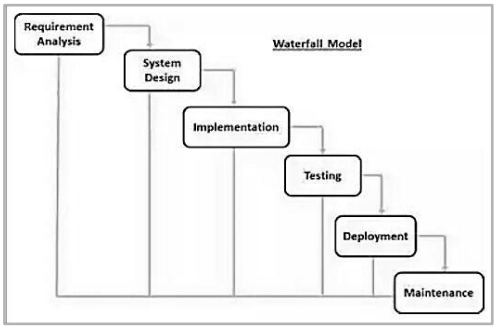

Fig.2: Waterfall Model

5.1 Sequential Phases In Waterfall Model

Phase 1: Requirement gathering and analysis –All probable requirements of the system to be developed are taken in this phase and documented in requirement specification documentation.

Phase 2: System plan –The obligation stipulations from first stage are deliberate in this stage and system plan is place. System pan assist in identify hardware and PC needs and also aids in crucial whole structure planning.

Phase 3: Execution –With inputs from system plan, we expand coding and we execute it. Incorporation and testing -all the components growth in the execution stage are incorporated into a pc system after testing of each component. Post incorporation the complete system is experienced for any errors and breakdowns.

Phase 4: Operation of system – Once the purposeful and non-functional testing is completed, the produce is deploying in the client background or unrestricted into the bazaar.

Phase 5: Maintenance – There are several concerns which arrive up in the user surroundings. To repair those problems areas are free. Also to augment the creation some enhanced accounts are unconfined. Preservation is finished to distribute these modifcation in the consumer.

Phase 6: Environment – *i*aterfall model is used for developing effective documentation of the system.

Phase 7: Documentation – Documentation is an important work as it is a best communication vehicle for developers the main idea of documentation is what and how the system do is explained in it.the creation of a document may represent an important milestone in the software development process.80% of work can be done with 20% of documentation.

5.2 Guidelines for Developing Documentation

- Common cover.
- 80-20 rule.
- Familiar vocabulary.
- Concise document.
- Organize an document.

6. Result

Selenium tool uses agile methodology hence it doesn't have proper documentation for the system and it is not suitable for maintenance. If proper documentation is not maintained then it leads to bugs. It is difficult to make changes in a software if needed. Therefore, agile methodology can be replaced by waterfall model methodology. Then selenium tool can be used for documentation of the system and it can be used for maintenance.

7. Conclusion

Automated testing techniques are used to improve the quality and ease the burden of the workers. A complete set of software testing automation system is a powerful

ISSN 2394-187(Online)
ISSN 2394-7179 (Print)

integrated test environment. The quality is an important thing in software product. Soto give a good quality product best software automated tool should be used for testing. The software must be fully tested before it could be handled to the customer side. By using the agile methodology the proper documentation can be maintained in selenium tools. In this paper an automated tool – selenium is also analyzed.

8. Future Enhancements

So far selenium tool is used only for web based application but doesn't support file upload facility. In future we may use some other technique in which selenium tool can be used for supporting window based application and also for supporting file upload facility.

References

[1] Jovanovic, Irena, "Software Testing Methods and Techniques", International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 4, August 2009, pp.38-58.
[2] Gaurav saini, Kestinarai, "Software testing techniques for test cases generation", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 2, Issue 5, June 2010, pp.111-119.
[3] Antonia Bertolino, "Software testing research and practice", International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 6, march 2009, pp.221-229.
[4] Zhang Hongchun, "Research on New Techniques and Development Trend of Software Testing" , 2nd International Conference on Computer Science and Electronics Engineering, December 2012, pp.341-348.
[5] Rasneetkaur Chauhan and Iqbal singh, "Latest Research and Development on Software Testing Techniques and Tools", International Journal of Current Engineering and Technology, Vol. 1, January 2012, pp.198 -203.