

Performance and Comparative Study of Functionality Testing Tools: Win Runner and QTP in IT World

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Abstract: Software testing is the process of identifying defects in any software projects. It presents a means to decrease errors, cut maintenance and overall software expenses. Main goal of software testing is to meet the customer requirements and deliver the quality of software projects. It divides two ways are manual testing and automation testing. The main purpose of this paper is to conduct a study and comparison of automation tools (Win Runner and QTP) in IT world. There is wide variety of software testing tools in the software market. Major software testing tools are Functional Testing, Test management, performance testing, and web testing and so on.

Keywords: Test management, Manual Testing, Automation Testing, Functional Testing, Performance Testing, Web Testing.

I INTRODUCTION

THE aim of Software Testing is to find all the defects and evaluation of the software projects. The main point of Software Testing is its quality. Quality means testing the relevant factors, portability, reliability, maintainability, security, correctness, compatibility etc [2]. Testing tools of software costly but results and quality of the projects are good. Here explains the process of software testing shown below.

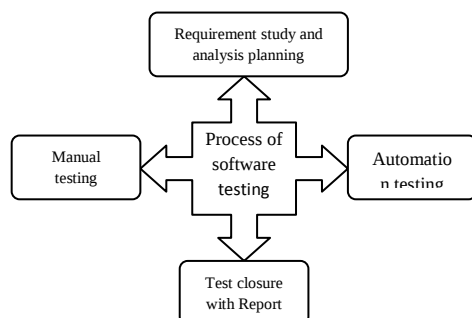


Fig.1. Process of Software Testing

From the above diagram explains process of manual and automation testing that means to verify that it satisfied requirement then find the difference between expected and actual results. These two ways of testing's done by Test engineers or testers. The main roles of testers are to find the reasonable defects manually or automatically. The problem of manual testing is to waste of time, not reusable, there is no scripting skill, and requires more man power but automated testing covers all the troubles of manual testing [6].

II SOME SKILLS SETS NEEDED FOR GOOD SOFTWARE TESTERS

A. Diagnostic and Logical Skills

The responsibility of software testers is to find out reasonable errors, evaluate the software projects and business scenarios. Before presenting the software in customer's place it should be done in effectively so testers should analyze multi-step problems.

B. Planning and Scheduling Skills

Test engineers should have to plan how to make testing in proper method and then time to identify and fix the severity of errors.

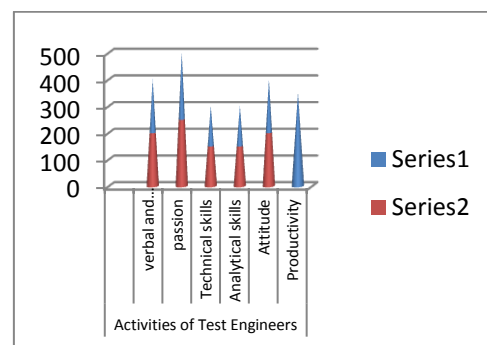


Fig.2. Skills needed for good software tester

From the above diagram every software testers have verbal communication, analytical skills attitudes and technical skills. As show above explains what are the skills needed for good software testers.

c. Assume from Customer View Point

Every tester thinks the project from the customer view. Before starting to test the project testers, understands the customer requirements clearly and undoubted.

D. Methodological Skills

The good testers should possess skills in automation tools and understanding scripts, good communication skills for writing test cases. Then it creates good communication between testers and developers.

III ACTIVITIES OF TEST MANAGER, TEST TEAM LEAD, TEST ENGINEER.

The main work of testing team is to deliver quality projects.
Following diagram explain the activities of testing process.

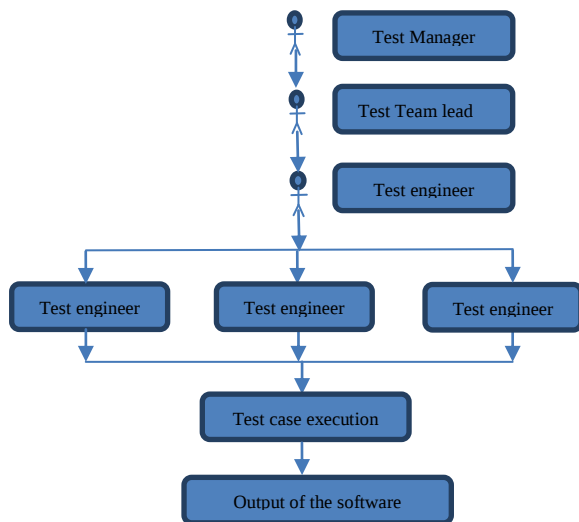


Fig.3. Activities of software team

From the above diagram testing work start from Test manager. The Test manager manages and communicates with Business Analyst. They assign resources to the project and evaluate weekly tester's status reports and calculate for testing projects.

Work of Test team leads are arrange the software test plan, review of the test case document from the test engineer, consider requirements, arrange test setup like hardware and software requirements and communicate with clients.

The main work of Test engineers were recognizing the project requirements, arranging the test case documents, sometimes they also arrange test setup, identifying defects and that defects are keep on a file or defect tracking tools.

IV SOFTWARE QUALITIES

Quality is essential for every product even software project. The important goal of the Software developments is to deliver high excellence of software. If deliver the good project follows these three points:

- Software requirements base from which quality is measured.
- Specified standards define a set of development criteria that guide the manner in which software is engineered.

- There is a set of implicit requirements that often goes unmentioned.

A. Quality Factors

The aspect that affects software can be categorized in two broad groups.

- factors that can be directly measured (E.g.) defects per function-point and
- Factors that can be measured only indirectly. (E.g.) Usability and maintainability.

B. Some Key Factors of Quality

Software quality is enhancing the quality of software program. Some Quality factors list out here.

- Understandability if the user necessities which must be clearly written so that it is easily understandable by the user.
- Trustworthiness implies in that product is to perform correctly over a period of time.
- Portability ease with which software can be transposed from one environment to another.
- Reusability software's can be use again and again.
- Litheness is the ability of software to add or modify functionality without changing the workable software.
- Performance is about processing of software speed that means software should not take more time for processing.
- Sturdiness means even some functionality will break down, the software may continue to running.
- Fault tolerance means if whole application crashes, it may recover itself using backup hardware and data.
- Safety measures are very important factor of quality factors in software development. It includes authorized and unauthorized techniques, data encryption, some network protections and so on.
- Exactness is a process by which functionality of the software meets customer requirements and specifications.
- Human engineering means accountability communicativeness and self descriptive of the software projects
- Unfussiness means the measures to which program understand without difficulty.

V TESTING PRINCIPLES

Principles are some methods have to be followed. Different principles are chase in software testing.

- Creating test plan Test plan usually describes plan for testing that means methods, techniques, mitigation, schedule and tools to be used to testing the projects.
- Start test early helps reduces the errors in early stage of development. If testers finding errors initial stage have to fix early.
- Entire test should be the need of customer requirements means compare to the expected results

and actual results should be same. From the customer's point of view most sever defects are those that cause the program to fail to meet its requirements.

- Design effective test cases it means test cases which are important for every tester to test the projects. Test cases must be written briefly and meaningfully. Some test cases writing tools available in the software market those tools are helps to write test cases easily. For example Test Management Tool likes Test Director.
- Testing done by different testers means done testing at various levels and tools. After writing test cases should be execute different platform and using different testing techniques at different levels with different automation tools.
- End of testing after execution of entire test cases, testing has to be stopped somewhere. At the end, outcome of the project should be quality and security.

VI DIFFERENCE BETWEEN MANUAL AND AUTOMATION TESTING

Manual Testing	Automation Testing
Test the project manually	Test the projects using some tools
Test one or two test cases at a time.	Run set of test case at a time.
More man power	Less man power
Take extra time to test the project.	Take lesser amount of time to test the project.
Vast investment in human resources	Less investment in human resources.
Less reliable.	More reliable.
No program can be writing.	Testers can script sophisticated tests.
Not suitable for large and critical projects	Suitable for large and critical projects.
Not required automation testing tools.	Required automation testing tools.

VI AUTOMATION AND MANUAL TESTING COMPARISON

Manual testing is implement by a person sitting in front of a computer cautiously perform the test steps. Automation Testing is a way to using an automation tool to perform test case suite. The automation software can also go into test data into the System under Test, evaluate expected and actual outcome and create exhaustive test reports.

Test Automation demands large investments of capital and resources. Consecutive development cycles will necessitate implementation of same test suite frequently. Using a test automation tool it's probable to document this test suite and repeat it as essential. Once the test suite is automated, no human interference is compulsory.

Automation tools are artificial software, which enhances testing process by openly cooperate with the application. It provides reliability and through testing and hence speed up

software development process by falling the period of the product delivery.

Manual testing is a moment intense process. Each time a latest assemble is received the tester has to perform all vital test once again to make sure of a flaw free product. Automation testing handles all the problems of manual testing. In these testing testers runs the script on testing tools.

Automation testing automates the steps of manual testing using automation tools such as functionality testing tools QTP (Quick Test Professional). These testing tools are increasing the test execution speed, reliable, programmable, repeatable and reusable. QTP and Win Runner are friendly and both tools can be access by the technical and non technical users.

Two documents are used in manual testing that is High Level Design documents (HLD) and Low Level Design documents (LLD). Functionality automation tools are done for Graphical User Interface (GUI). Tools help in increases the working speed, comprehensive and more reliable, programmable rather than manual testing. Many modern GUIs have same look, feel and concepts. A wide collection of GUI testing tools has appeared on the market over the past few years. This is normally done through the use of a variety of test cases.

VIII. KEY BENEFITS OF AUTOMATED DELIVERS SOFTWARE

Some benefits of using automation tools that

- Collective coverage to identify errors.
- Decrease the cost of failure.
- Repeated work to save time and reduce the cost of market.
- Automation can help buildup test cases over the life of the application.

IX. HOW TO AUTOMATE?

Automation tools are sustaining computer language like VB scripting. There are many tools obtainable which can be used to write scripts. Some processes of tools are

- Recognize areas within software for automation.
- Assortment of suitable tool for test automation.
- Writing test scripts.
- Growth of test suits.
- Implementation of scripts.
- Generate result reports.
- Identify any possible bug.

X. FEATURES OF AUTOMATION TOOLS

A. Record and Playback:

Any automation tool when used to automate a test process initially recorded and played back. It is a trouble-free method of recording script and re-playing to verify if it gives the preferred result. The automation process is generally stronger to use built-in functions to straight test

objects and databases. An automation process becomes a repetitive experience if the tool fails to recognize various objects pertaining to the application.

B. Integration:

Combination is suitable more and more essential nowadays. It provides amenities like

- i) Operation various test running suites
- ii) Move up a bug unswervingly from the tool.
- iii) Feed the information collect from check logs
- iv) Integration with products like word, excel or necessities running tools.

C. Environment Support:

A computerization tool is supposed to sustain or be well-suited with various environments similar to the most recent java release, oracle power builder, WAP etc. Most tools can border to unconfirmed environments if the developers in that environment provide classes that representation several of the applications facts but whether a developer will or has instance to do this another query. Eventually that is the most vital part of automation.

a. Data Base Tests

An automation tool should also present the ability to conserve data by share the data in a Database. It should also verify the backend database to validate the proper validations of tests is accepted out on the front end of an application. A large amount of the databases like oracle, SQL Server, Sybase etc sustain the common query language SQL and a protocol for communication with these database called ODBC (JDBC can be used on java environments).

b. Data Functions

Applications normally provide facility to store offline data. This can be done by creating and manipulation data that is to be input to the application. It should also provide facilities to check

- Whether the tools permit specifying the information essential.
- Whether automatic creation of data is achievable
- Whether interfacing documentation, spreadsheets etc are probable.
- Whether data can be accessed randomly.
- If the information right of entry is actually unsystematic.

These functions are also very significant as the tester shift from the record/playback stage, to data-driven and framework testing. Data-driven tests are tests that restore rigid coded names, address, numbers; etc with variables complete from an outside foundation regularly a CSV (Comma Separated variable) file, spreadsheet or database. The eventual target Frameworks are to organize automation testing tools. They supply an interface to all the applications below test by revealing a proper list of functions, databases, etc. This facilitates an inexperienced tester/user to run tests by just successively the test outline with known information. A test structure has equivalent to software frameworks where the tester/user can develop an

encapsulation cover of software (framework) about the applications, databases etc and expose functions, classes, methods etc that is used to identify the fundamental application, come back information, input data, etc. But this essential lot of time, capable capital and money.

c. Object Mapping

Object mapping manipulate the plan of a creation, by enforcing the development/design team to use typical and not convention objects. Most custom objects will perform like a parallel regular control. Some of the normal objects that are used in applications are

- Pushbuttons
- Edit boxes
- Check boxes
- Combo boxes
- Radio buttons
- List views

D. Image Testing

Image testing is used to test bit map and related images. It can also be used with applications that have painted controls like those in the calculator purpose. This testing can be done only if the panels coordinate are recognized. The tools should give services for OCR (optical character recognition) evaluation of two images, cover definite areas on the display etc.

E. Object Name Map

When testing a function is essential to message that the tool report events beside the items that it interacts with. These things are moreover indentifies during the co-ordinates on the monitor or preferably through some distinctive object orientation referred to as a tag, object ID, index, name, etc. Therefore the tool should supply services to exclusively recognize each object it interacts with and to classify the display co-ordinates.

F. Object Identify Tool

The entity individuality tool acts like detective that looks at the internals of the object giving facts like the object name, ID and related. This will permit you to location that object within a task call. The tool should give you facts of some of the object's properties, mainly those connected with exclusively identifying the object or window. The tool will typically present the tester with a point and ID check where you can use the mouse to top at the object and in some window you will see all of that objects ID's and properties.

G. Test/Error recovery

The test/error revival procedure provides the base to produce a really strong test suite. This is one of the trickiest areas that are to be automated. It helps to provide solutions when unpredicted actions like function crash, purpose not getting accurate information, fault messages appearing, caution messages appearing etc happen. The ranking of the automation tool with depend on how much errors the tool can arrest, the kind of mistake, how it improve from errors, etc.

XI SOME OF THE SOFTWARE TOOLS

Following tools are using automation testing.

- HP Quick Test Professional

It is a mercury Interactive product. It uses the visual basic scripting language. QTP supports exception handling and data driven testing.

- Selenium

It is portable software testing frame work for web applications. It deploys Windows, Linux and Macintosh platforms.

- IBM Relational Functional Tester.

This tool used by quality assurance teams to perform automated regression testing. Testers can edit the script using standard commands.

- Silk Test.

These tools are for automated function and regression testing. It was developed by segue software. It is similar to C++.

- Test Complete.

It is a functional testing tools developed by smart bear software. Test complete gives testers the skills to create automated tests for Microsoft Windows, Web, Android (OS).

- Testing Anywhere.

This software produced by San Jose based automation anywhere. This software allows to testing applications, websites, objects, controls and GUI front ends. It supports windows 8, Window 7, Vista, Windows server 2008, 2003, XP.

- Win Runner.

It is a GUI testing tools. In this tool using TSL (Test Script Language).It is written by Mercury Interactive.

- Load Runner.

It is a performance testing tool. This tools works by creating virtual users who take the place of real users. If simulate thousands of concurrent users.

XII. WORKING OF AUTOMATION TEST COMPLETE

Automation testing tool test is done GUI record play back. Test complete supports two types of applications, web applications and window applications. Software testing is important phase in development life cycle. There are many open source web testing and many windows application tools available in the software market.

Automation testing tools are separated their work that is

- Functionality testing tools are working to test the functionality of the project that means test the function of all components (buttons) e.g. In visual Basic having command buttons, label box, text box, minimize, maximize close button, and testing Images etc.

Some Examples of functionality testing tools are Win Runner, QTP(Quick Test Professional), Silk Test, Silk performer, Silk Monitor and Rational Robot.

- Test Management Tools are used to write test cases and store test cases in this tool. It is very useful for writing test cases and storing defects that are new, open, Rejected, fixed, cancelled, and closed bugs. It is not a requirements gathering tool.

Examples of Test Management tool is Test Director.

- Performance testing tools are used to prevent performance problems. It helps to generates virtual user and this virtual user to perform under stress within the application.

Examples of some performance testing tools are Load Runner and Rational performance Tester.

XIII COMPARISON BETWEEN QTP AND WIN RUNNER

FEATURES	QUICK TEST PROFESSIONAL	WINRUNNER
Licensing Cost	Approved and very costly, Ten user license expenses approx. 60L	License cost lower than QTP
Application support	A customer server application Only. It also supports addons, but user needs to buy permit for them.	It can also support customer server application. It supports addons.
Object Oriented Language support and Scalability	Scripts can be developed only in VBScript or JavaScript.	It can be developed TSL (Test Script Language) script. It is based on C Programming.
Support for operating system/platforms	QTP supports simply Windows XP.	It supports Internet Explorer 6.x and Netscape 6.x, Windows XP.
Programming skills	QTP is quite simple to use. It is quite easy to correct the script, parameterize, navigate, playback and validate the outcome. QTP support .net application.	The test scripts are written in Test Scripting Language in Win Runner. It is similar to other programming language. It is not support .net application.
usage	QTP is quite simple to be trained in a little moment.	It is easy to use.
Database applications	QTP works very fine with database Applications rather than Win Runner.	It is also works well.
Platform dependency	It is rigid to organize smoke tests for web applications using QTP mainly with Windows7. It is platform dependent tool.	It is a platform independent tool
Report	With QTP we can	Compare to QTP

Generation	easily make most complete reports due to the availability of a well-organized online help.	difficult to generate reports.
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XIV CONCLUSION

Software Testing tools are costly so most of the software companies done manual testing, but manual testing are not efficiency compare to automation testing. To deliver quality software projects done by automation testing. Automation testing is appropriate than manual testing. Out coming of the projects are very qualities, increasing the test execution speed, get more reliable and reusable are in Recording, play back of scripts, and test bulk of test case. One can choose testing tool support on the kind of application require to be tested, funds, and the efficiency necessary. If test automation requirements are receiving satisfied with QTP, there is no require going for Win Runner. Equally these tools are similar purpose; it is just that QTP flexible tool for a critical and more perilous Application Under Test (AUT). QTP is the most excellent tool calculates up to Win Runner. This Research work can be further enhanced by including more testing tools.

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