

Importance's of Test Plan & Testing Procedure vs Verification & Validation – Researcher View

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Software testing is a process of executing a program or application with the intent of finding the software bugs. It can also be stated as the process of validating and verifying that a **software** program or application or product: Meets the business and technical requirements that guided its design and development, here in our paper we introduce the concept of validation and verification and its impact and importance's to the product development then we will look at the concept of software testing methods and its significances in the software testing.

Introduction A Software Testing is the process of evaluation of a software item to detect differences between given input and expected output. It is a process that should be done during the development process. In simple words, testing is executing a system in order to identify any errors or missing requirements in contrary to the actual requirements.

Why Testing?

Testing validates that the system being developed is what the user needs.

Software Testing[1] contributes to improving the quality of the product.

The purpose of Software testing is to find defects/ bugs.

Software Testing can safeguard the organization from legal liabilities by verifying compliance.

Test Plan

A Test plan is a document describing the scope, approach, objectives, resources, and schedule of a software testing effort. It identifies the items to be tested[6,7], items not be tested, who will do the testing, the test approach followed, what will be the pass/fail criteria.

It is also a document we share with the Business Analysts, Project Managers, Development teams. This is to enhance the level of transparency into the QA team's[7]working to the external teams. It is documented by the QA Manager/QA Lead based on the inputs from the QA team members. Test plan is not static and is updated on an on demand basis.

Test Plan Template (IEEE 829 Format)

- 1)Test Plan Identifier
- 2) References
- 3) Introduction
- 4) Test Items
- 5) Software Risk Issues
- 6) Features to be Tested
- 7) Features not to be Tested

- 8) Approach
- 9) Item Pass/Fail Criteria
- 10) Suspension Criteria and Resumption Requirements
- 11) Test Deliverables
- 12) Remaining Test Tasks
- 13) Environmental Needs

- 14) Staffing and Training Needs
- 15) Responsibilities
- 16) Schedule
- 17) Planning Risks and Contingencies
- 18) Approvals
- 19) Glossary

Testing Procedure

The steps in testing consist of:

1. Creation of all the test scenarios and test cases
2. Preparation of a test case document that has a brief description of the test case, steps to conduct tests and expected result
3. Defect Report generation.

Outlined below are the main test types that will be performed

Application Characteristics – Information about the application is provided to help the testing team in the testing work[2,3].

1. Stability – Focusing on the application being stable on the device

2. Application Launch – Once an application is loaded it must start and stop correctly in relation to the device and other applications on the device.

3. User Interface

4. Functionality – Documented features are implemented in the application and work as expected.

5. Connectivity – The application must demonstrate its ability to communicate over a network correctly. It must be capable of dealing with both network problems and server-side problems.

Deliverables

- Test Plan

- Test Cases Document – Document with a description and expected result for each test case.
- Test Results – The Pass/Fail status of each test case and the list of issues.

Verification & Validation

Verification and Validation (V&V) is the process of checking that a software system meets specifications and that it fulfills its intended purpose.

Here the point to raise is “How a good verification can happen” ?

By Test Plan:- Which is done by the test lead along with their team and document describing the scope, approach, objectives, resources, and schedule of a software testing effort. It identifies the items to be tested, items not to be tested, who will do the testing, the test approach[7] followed, what will be the pass/fail criteria, means they need to know complete requirements of the product and transforming[8] that into the standard template form which will go for good test cases in turn which leads to successful testing approach/procedure.

The Testing Procedure

1. will give all the test scenarios and test cases

2. Preparation of a test case[6] document that has a brief description of the test case, steps to conduct tests and expected result

The above good approach is useful for carrying out the good verification

Verification is the process of finding out “Are we doing the Right Product”

This we can achieve by 1 & 2 steps of testing procedure steps.

It makes sure that the product is designed to deliver all functionality to the customer. Verification[5] is done at the starting of the development process. It includes reviews and meetings, walkthroughs, inspection to evaluate documents, plans, code, requirements and specifications.

Validation

Determining if the system complies with the requirements and performs functions for which is intended and meets the organization’s goals and user needs. Validation[7,8] is done at the end of the development process and takes place after verifications are completed.

Validations can cross verified with the 3 point of above steps of testing procedure steps.

Most common defects are:

Incorrect functionality

Incorrect Data edit

Poor Performance

Incorrect Compatibility

Poor Security

Difference between Software Verification and Validation

Verification	Validation
Verification is the process of evaluating products of a development phase to find out whether they meet the specified requirements.	Validation is the process of evaluating software at the end of the development process to determine whether software meets the customer expectations and requirements.
The objective of verification is to make sure that the product being develop is as per the requirements and design specifications.	The objective of Validation is to make sure that the product actually meet up the user’s requirements, and check whether the specifications were correct in the first place.
Activities involved in Verification are: Reviews, Meetings and Inspections.	Activities involved in in Validation are: Black box Testing, White box Testing

	and Gray box Testing.
Verification is carried out by QA team	Validation is carried out by testing team
Cost of errors caught in Verification is less than errors found in validation	Cost of errors caught in Validation is more than errors found in verification.

Conclusion In the context of testing, “Verification and Validation” are very widely and commonly used terms. Most of the times, we consider the terms same, but

actually the terms are quite different. Confirms to requirements (Producer view of quality) & Fit for use (consumers view of quality) which can be

attained by using good standards in testing plan and Testing approach[3,4], to have better Verification and Validation[6,7] having test plan and testing procedure will help .

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