Standard Glossary of Terms used in Software Testing

Version 3.1

Foundation Extension - Model-Based Testing Terms

International Software Testing Qualifications Board

---

actor

User or any other person or system that interacts with the test object in a specific way.

audit

Ref: IEEE 1028

An independent evaluation of software products or processes to ascertain compliance to standards, guidelines, specifications, and/or procedures based on objective criteria, including documents that specify: the form or content of the products to be produced, the process by which the products shall be produced, and how compliance to standards or guidelines shall be measured.

automated testware

Testware used in automated testing, such as tool scripts.

availability

Ref: IEEE 610

The degree to which a component or system is operational and accessible when required for use. Often expressed as a percentage.

best practice

A superior method or innovative practice that contributes to the improved performance of an organization under given context, usually recognized as "best" by other peer organizations.

boundary value

An input value or output value which is on the edge of an equivalence partition or at the smallest incremental distance on either side of an edge, for example the minimum or maximum value of a range.

boundary value analysis

See Also: boundary value

A black-box test design technique in which test cases are designed based on boundary values.

boundary value coverage

The percentage of boundary values that have been exercised by a test suite.

branch

A basic block that can be selected for execution based on a program construct in which one of two or more alternative program paths is available, e.g., case, jump, go to, if-then-else.

branch coverage

The percentage of branches that have been exercised by a test suite. 100% branch coverage implies both 100% decision coverage and 100% statement coverage.

CASE

Acronym for Computer Aided Software Engineering.

certification

The process of confirming that a component, system or person complies with its specified requirements, e.g., by passing an exam.

change management

See Also: configuration management

(1) A structured approach to transitioning individuals and organizations from a current state to a desired future state. (2) Controlled way to effect a change, or a proposed change, to a product or service.

code

Ref: IEEE 610

Computer instructions and data definitions expressed in a programming language or in a form output by an assembler, compiler or other translator.

complexity

See Also: cyclomatic complexity

The degree to which a component or system has a design and/or internal structure that is difficult to understand, maintain and verify.

component

Synonyms: module , unit

A minimal software item that can be tested in isolation.

component testing

Ref: After IEEE 610

Synonyms: module testing , program testing , unit testing

The testing of individual software components.

condition

See Also: condition testing

Synonyms: branch condition

A logical expression that can be evaluated as True or False, e.g., A>B.

condition coverage

Synonyms: branch condition coverage

The percentage of condition outcomes that have been exercised by a test suite. 100% condition coverage requires each single condition in every decision statement to be tested as True and False.

configuration

The composition of a component or system as defined by the number, nature, and interconnections of its constituent parts.

coverage

Synonyms: test coverage

The degree, expressed as a percentage, to which a specified coverage item has been exercised by a test suite.

coverage item

An entity or property used as a basis for test coverage, e.g., equivalence partitions or code statements.

data-driven testing

Ref: Fewster and Graham   **See Also:** keyword-driven testing

A scripting technique that stores test input and expected results in a table or spreadsheet, so that a single control script can execute all of the tests in the table. Data-driven testing is often used to support the application of test execution tools such as capture/playback tools.

decision

A program point at which the control flow has two or more alternative routes. A node with two or more links to separate branches.

decision coverage

The percentage of decision outcomes that have been exercised by a test suite. 100% decision coverage implies both 100% branch coverage and 100% statement coverage.

decision table

Synonyms: cause-effect decision table

A table showing combinations of inputs and/or stimuli (causes) with their associated outputs and/or actions (effects), which can be used to design test cases.

decision table testing

Ref: Egler63   **See Also:** decision table

A black-box test design technique in which test cases are designed to execute the combinations of inputs and/or stimuli (causes) shown in a decision table.

defect

Synonyms: bug , fault , problem

A flaw in a component or system that can cause the component or system to fail to perform its required function, e.g., an incorrect statement or data definition. A defect, if encountered during execution, may cause a failure of the component or system.

defect management

Ref: After IEEE 1044

Synonyms: problem management

The process of recognizing, investigating, taking action and disposing of defects. It involves recording defects, classifying them and identifying the impact.

domain

The set from which valid input and/or output values can be selected.

effectiveness

See Also: efficiency

The capability of producing an intended result.

efficiency

Ref: ISO 9126

(1) The capability of the software product to provide appropriate performance, relative to the amount of resources used, under stated conditions. (2) The capability of a process to produce the intended outcome, relative to the amount of resources used.

equivalence partition

Synonyms: equivalence class

A portion of an input or output domain for which the behavior of a component or system is assumed to be the same, based on the specification.

equivalence partition coverage

The percentage of equivalence partitions that have been exercised by a test suite.

equivalence partitioning

Synonyms: partition testing

A black-box test design technique in which test cases are designed to execute representatives from equivalence partitions. In principle, test cases are designed to cover each partition at least once.

error

Ref: After IEEE 610

Synonyms: mistake

A human action that produces an incorrect result.

---

exit criteria

Ref: After Gilb and Graham

Synonyms: completion criteria , test completion criteria

The set of generic and specific conditions, agreed upon with the stakeholders for permitting a process to be officially completed. The purpose of exit criteria is to prevent a task from being considered completed when there are still outstanding parts of the task which have not been finished. Exit criteria are used to report against and to plan when to stop testing.

---

expected result

Synonyms: expected outcome , predicted outcome

The behavior predicted by the specification, or another source, of the component or system under specified conditions.

---

feature

Ref: After IEEE 1008

Synonyms: software feature

An attribute of a component or system specified or implied by requirements documentation (for example reliability, usability or design constraints).

---

functional requirement

Ref: IEEE 610

A requirement that specifies a function that a component or system must perform.

---

functionality

Ref: ISO 9126

The capability of the software product to provide functions which meet stated and implied needs when the software is used under specified conditions.

GUI

Acronym for Graphical User Interface.

high-level test case

See Also: low-level test case

Synonyms: abstract test case , logical test case

A test case without concrete (implementation level) values for input data and expected results. Logical operator are used: instances of the actual values are not yet defined and/or available.

IDEAL

An organizational improvement model that serves as a roadmap for initiating, planning, and implementing improvement actions. The IDEAL model is named for the five phases it describes: initiating, diagnosing, establishing, acting, and learning.

impact analysis

The assessment of change to the layers of development documentation, test documentation and components, in order to implement a given change to specified requirements.

input

A variable (whether stored within a component or outside) that is read by a component.

inspection

Ref: After IEEE 610, IEEE 1028   **See Also:** peer review

A type of peer review that relies on visual examination of documents to detect defects, e.g., violations of development standards and non-conformance to higher level documentation. The most formal review technique and therefore always based on a documented procedure.

integration

The process of combining components or systems into larger assemblies.

keyword-driven testing

See Also: data-driven testing

Synonyms: action word-driven testing

A scripting technique that uses data files to contain not only test data and expected results, but also keywords related to the application being tested. The keywords are interpreted by special supporting scripts that are called by the control script for the test.

low-level test case

See Also: high-level test case

Synonyms: concrete test case

A test case with concrete (implementation level) values for input data and expected results. Logical operators from high-level test cases are replaced by actual values that correspond to the objectives of the logical operators.

maintainability

Ref: ISO 9126

The ease with which a software product can be modified to correct defects, modified to meet new requirements, modified to make future maintenance easier, or adapted to a changed environment.

---

maintenance

Ref: IEEE 1219

Modification of a software product after delivery to correct defects, to improve performance or other attributes, or to adapt the product to a modified environment.

---

maturity level

Ref: TMMi

Degree of process improvement across a predefined set of process areas in which all goals in the set are attained.

MBT model

Any model used in model-based testing.

---

measure

Ref: ISO 14598

The number or category assigned to an attribute of an entity by making a measurement.

---

metric

Ref: ISO 14598

A measurement scale and the method used for measurement.

---

model coverage

The degree, expressed as a percentage, to which model elements are planned to be or have been exercised by a test suite.

---

model-based testing (MBT)

Testing based on or involving models.

---

modeling tool

Ref: Graham .

A tool that supports the creation, amendment and verification of models of the software or system.

---

multiple condition coverage

Synonyms: branch condition combination coverage , condition combination coverage

The percentage of combinations of all single condition outcomes within one statement that have been exercised by a test suite. 100% multiple condition coverage implies 100% modified condition decision coverage.

non-functional requirement

A requirement that does not relate to functionality, but to attributes such as reliability, efficiency, usability, maintainability and portability.

offline MBT

Model-based testing approach whereby test cases are generated into a repository for future execution.

online MBT

Synonyms: on-the-fly MBT

Model-based testing approach whereby test cases are generated and executed simultaneously.

output

A variable (whether stored within a component or outside) that is written by a component.

pairwise testing

See Also: combinatorial testing, n-wise testing, orthogonal array testing

A black-box test design technique in which test cases are designed to execute all possible discrete combinations of each pair of input parameters.

pass

Synonyms: test pass

A test is deemed to pass if its actual result matches its expected result.

path

Synonyms: control flow path

A sequence of events, e.g., executable statements, of a component or system from an entry point to an exit point.

path coverage

The percentage of paths that have been exercised by a test suite. 100% path coverage implies 100% LCSAJ coverage.

performance

Ref: After IEEE 610   **See Also:** efficiency

Synonyms: time behavior

The degree to which a system or component accomplishes its designated functions within given constraints regarding processing time and throughput rate.

---

performance indicator

Ref: CMMI

Synonyms: key performance indicator

A high-level metric of effectiveness and/or efficiency used to guide and control progressive development, e.g., lead-time slip for software development.

---

precondition

Environmental and state conditions that must be fulfilled before the component or system can be executed with a particular test or test procedure.

---

priority

The level of (business) importance assigned to an item, e.g., defect.

---

process

Ref: ISO 12207

A set of interrelated activities, which transform inputs into outputs.

---

project

Ref: ISO 9000

A project is a unique set of coordinated and controlled activities with start and finish dates undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.

---

qualification

Ref: ISO 9000

The process of demonstrating the ability to fulfill specified requirements. Note the term "qualified" is used to designate the corresponding status.

---

quality

Ref: After IEEE 610

The degree to which a component, system or process meets specified requirements and/or user/customer needs and expectations.

quality assurance

Ref: ISO 9000

Part of quality management focused on providing confidence that quality requirements will be fulfilled.

quality attribute

Ref: IEEE 610

Synonyms: quality characteristic , software product characteristic , software quality characteristic

A feature or characteristic that affects an item's quality.

regression testing

Testing of a previously tested program following modification to ensure that defects have not been introduced or uncovered in unchanged areas of the software, as a result of the changes made. It is performed when the software or its environment is changed.

requirement

Ref: After IEEE 610

A condition or capability needed by a user to solve a problem or achieve an objective that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed document.

requirements phase

Ref: IEEE 610

The period of time in the software lifecycle during which the requirements for a software product are defined and documented.

result

See Also: actual result, expected result

Synonyms: outcome , test outcome , test result

The consequence/outcome of the execution of a test. It includes outputs to screens, changes to data, reports, and communication messages sent out.

review

Ref: After IEEE 1028

An evaluation of a product or project status to ascertain discrepancies from planned results and to recommend improvements. Examples include management review, informal review, technical review, inspection, and walkthrough.

risk

A factor that could result in future negative consequences.

risk-based testing

An approach to testing to reduce the level of product risks and inform stakeholders of their status, starting in the initial stages of a project. It involves the identification of product risks and the use of risk levels to guide the test process.

safety

Ref: ISO 9126

The capability of the software product to achieve acceptable levels of risk of harm to people, business, software, property or the environment in a specified context of use.

security

Ref: ISO 9126   **See Also:** functionality

Attributes of software products that bear on its ability to prevent unauthorized access, whether accidental or deliberate, to programs and data.

simulation

Ref: ISO 2382/1

The representation of selected behavioral characteristics of one physical or abstract system by another system.

simulator

Ref: After IEEE 610, DO178b   **See Also:** emulator

A device, computer program or system used during testing, which behaves or operates like a given system when provided with a set of controlled inputs.

software

Ref: IEEE 610

Computer programs, procedures, and possibly associated documentation and data pertaining to the operation of a computer system.

specification

Ref: After IEEE 610

A document that specifies, ideally in a complete, precise and verifiable manner, the requirements, design, behavior, or other characteristics of a component or system, and, often, the procedures for determining whether these provisions have been satisfied.

standard

Ref: After CMMI

Formal, possibly mandatory, set of requirements developed and used to prescribe consistent approaches to the way of working or to provide guidelines (e.g., ISO/IEC standards, IEEE standards, and organizational standards).

state diagram

Ref: IEEE 610

A diagram that depicts the states that a component or system can assume, and shows the events or circumstances that cause and/or result from a change from one state to another.

state transition

A transition between two states of a component or system.

state transition testing

See Also: N-switch testing

Synonyms: finite state testing

A black-box test design technique in which test cases are designed to execute valid and invalid state transitions.

statement

Synonyms: source statement

An entity in a programming language, which is typically the smallest indivisible unit of execution.

statement coverage

The percentage of executable statements that have been exercised by a test suite.

suitability

Ref: ISO 9126   **See Also:** functionality

The capability of the software product to provide an appropriate set of functions for specified tasks and user objectives.

system

Ref: IEEE 610

A collection of components organized to accomplish a specific function or set of functions.

system testing

Ref: Hetzel

Testing an integrated system to verify that it meets specified requirements.

system under test (SUT)

See test object.

Systematic Test and Evaluation Process (STEP)

See Also: content-based model

A structured testing methodology, also used as a content-based model for improving the testing process. Systematic Test and Evaluation Process (STEP) does not require that improvements occur in a specific order.

---

test

Ref: IEEE 829

A set of one or more test cases.

---

test adaptation layer

The layer in a test automation architecture which provides the necessary code to adapt test scripts on an abstract level to the various components, configuration or interfaces of the SUT.

---

test automation

The use of software to perform or support test activities, e.g., test management, test design, test execution and results checking.

---

test basis

Ref: After TMap

All documents from which the requirements of a component or system can be inferred. The documentation on which the test cases are based. If a document can be amended only by way of formal amendment procedure, then the test basis is called a frozen test basis.

---

test case

Ref: After IEEE 610

A set of input values, execution preconditions, expected results and execution postconditions, developed for a particular objective or test condition, such as to exercise a particular program path or to verify compliance with a specific requirement.

---

test case explosion

The disproportionate growth of the number of test cases with growing size of the test basis, when using a certain test design technique. Test case explosion may also happen when applying the test design technique systematically for the first time.

---

test condition

Synonyms: test requirement , test situation

An item or event of a component or system that could be verified by one or more test cases, e.g., a function, transaction, feature, quality attribute, or structural element.

---

test data

Data that exists (for example, in a database) before a test is executed, and that affects or is affected by the component or system under test.

---

test data preparation tool

Synonyms: test generator

A type of test tool that enables data to be selected from existing databases or created, generated, manipulated and edited for use in testing.

---

test design

See Also: test design specification

The process of transforming general test objectives into tangible test conditions and test cases.

---

test design technique

Synonyms: test case design technique , test specification technique , test technique

Procedure used to derive and/or select test cases.

---

test execution

The process of running a test on the component or system under test, producing actual result(s).

---

test execution tool

A type of test tool that is able to execute other software using an automated test script, e.g., capture/playback.

---

test harness

A test environment comprised of stubs and drivers needed to execute a test.

---

test implementation

The process of developing and prioritizing test procedures, creating test data and, optionally, preparing test harnesses and writing automated test scripts.

---

test level

Ref: After TMap

Synonyms: test stage

A group of test activities that are organized and managed together. A test level is linked to the responsibilities in a project. Examples of test levels are component test, integration test, system test and acceptance test.

---

test management

The planning, estimating, monitoring and control of test activities, typically carried out by a test manager.

---

test management tool

A tool that provides support to the test management and control part of a test process. It often has several capabilities, such as testware management, scheduling of tests, the logging of results, progress tracking, incident management and test reporting.

test manager

Synonyms: test leader

The person responsible for project management of testing activities and resources, and evaluation of a test object. The individual who directs, controls, administers, plans and regulates the evaluation of a test object.

test model

A model describing testware that is used for testing a component or a system under test.

test object

See Also: test item

Synonyms: system under test

The component or system to be tested.

test objective

A reason or purpose for designing and executing a test.

test phase

Ref: After Gerrard

A distinct set of test activities collected into a manageable phase of a project, e.g., the execution activities of a test level.

test plan

Ref: After IEEE 829

A document describing the scope, approach, resources and schedule of intended test activities. It identifies amongst others test items, the features to be tested, the testing tasks, who will do each task, degree of tester independence, the test environment, the test design techniques and entry and exit criteria to be used, and the rationale for their choice, and any risks requiring contingency planning. It is a record of the test planning process.

test planning

The activity of establishing or updating a test plan.

test procedure specification

Ref: After IEEE 829　　**See Also:** test specification

Synonyms: test procedure , test scenario

A document specifying a sequence of actions for the execution of a test. Also known as test script or manual test script.

---

test process

The fundamental test process comprises test planning and control, test analysis and design, test implementation and execution, evaluating exit criteria and reporting, and test closure activities.

---

test script

Commonly used to refer to a test procedure specification, especially an automated one.

---

test selection criteria

The criteria used to guide the generation of test cases or to select test cases in order to limit the size of a test.

---

test suite

Synonyms: test case suite , test set

A set of several test cases for a component or system under test, where the post condition of one test is often used as the precondition for the next one.

---

test tool

Ref: TMap　　**See Also:** CAST

A software product that supports one or more test activities, such as planning and control, specification, building initial files and data, test execution and test analysis.

---

testability

Ref: ISO 9126　　**See Also:** maintainability

The capability of the software product to enable modified software to be tested.

---

tester

A skilled professional who is involved in the testing of a component or system.

---

testing

The process consisting of all lifecycle activities, both static and dynamic, concerned with planning, preparation and evaluation of software products and related work products to determine that they satisfy specified requirements, to demonstrate that they are fit for purpose and to detect defects.

---

traceability

See Also: horizontal traceability, vertical traceability

The ability to identify related items in documentation and software, such as requirements with associated tests.

traceability matrix

A two-dimensional table, which correlates two entities (e.g., requirements and test cases). The table allows tracing back and forth the links of one entity to the other, thus enabling the determination of coverage achieved and the assessment of impact of proposed changes.

understandability

Ref: ISO 9126   **See Also:** usability

The capability of the software product to enable the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use.

usability

Ref: ISO 9126

The capability of the software to be understood, learned, used and attractive to the user when used under specified conditions.

use case

A sequence of transactions in a dialogue between an actor and a component or system with a tangible result, where an actor can be a user or anything that can exchange information with the system.

use case testing

Synonyms: scenario testing , user scenario testing

A black-box test design technique in which test cases are designed to execute scenarios of use cases.

validation

Ref: ISO 9000

Confirmation by examination and through provision of objective evidence that the requirements for a specific intended use or application have been fulfilled.

verification

Ref: ISO 9000

Confirmation by examination and through provision of objective evidence that specified requirements have been fulfilled.