



ISTQB GLOSSARY

Version 2018-10-02

**Based on "Standard Glossary of Terms Used in Software Testing,
version 3.2"**

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Scope

This glossary is a copy of the ISTQB Standard Glossary of Terms Used in Software Testing issued by the ISTQB Glossary Working Group.

The ISTQB Standard Glossary of Terms Used in Software Testing contains the definitions of testing terms used in the different ISTQB syllabi. This includes all terms stated as keywords in the ISTQB syllabi, as well as other terms of major importance.

The ISTQB Glossary focuses on terms that have a specific meaning in testing. Some related non-testing terms are also included if they play a major role in testing, such as terms used in software quality assurance and software lifecycle models. However, most terms of other software engineering disciplines are not covered in this document, even if they are used in various ISTQB syllabi.

Purpose of the ISTQB Glossary

The ISTQB Glossary has two main objectives:

- Support the ISTQB syllabi by defining the terms used in the various syllabi consistently;
- Support communication within the international testing community and with its stakeholders by providing a standard testing vocabulary.

In compiling this Glossary, the ISTQB Glossary Working Group has sought the views and comments of a broad spectrum of opinion in industry, commerce and government bodies and organizations, with the aim of producing an international testing standard that would gain wide acceptance. Total agreement will rarely, if ever, be achieved in compiling a document of this nature. Contributions to this glossary have been received from testing communities from all over the world.

Being written in English, the current version of the Glossary is designed to also support other languages. ISTQB Member Boards are encouraged to incorporate their translations.

Glossary Structure

The glossary has been arranged in a single section of terms and their definitions, ordered alphabetically. For each term, the following additional attributes are shown where applicable:

- Ref: without the addition of “after”, e.g., ISO 25010, this means that the exact definition of the reference is used. In case of minor changes used to adapt the definition to the context of the ISTQB Glossary, the addition “after” is used, e.g., Ref: After ISO 25010. The complete list of references used in the ISTQB Glossary is listed below.
- Synonym: Some terms are preferred to other synonymous ones, in which case, the preferred term appears as an entry, with the synonyms indicated.
- See also: These entries contain cross-references to related terms. Such cross-references are indicated for relationships such as broader term to a narrower term and overlapping meaning between two terms.

Acknowledgements

This Glossary has been produced by the Glossary Working Group of the International Software Testing Qualifications Board (ISTQB).

At the time the Glossary version 3.2 was completed the Glossary Working Group had the following members (alphabetic order):

Tobias Ahlgren (Sweden), Vineta Arnicane (Latvia), Armin Beer (Austria), Armin Born (Switzerland), Mette Bruhn-Pedersen (Denmark), Gergory Collina (USA), Matthias Daigl (Germany), Ernst Dúring (Norway), George Fialkovitz (Brazil), Matthias Hamburg (Chair, Germany), Tamás Horváth (Hungary), Leanne Howard (Australia), Ian Howles (Great Britain), Marek Majernik (Slovakia), Gustavo Marquez Sosa (Spain), Judy McKay (USA), Gary Mogyorodi (Vice-Chair, Canada), Ana Paiva (Portugal), Juha Pomppu (Finland), Meile Posthuma (Netherlands), Adam Roman (Poland), Lucjan Stapp (Poland), Karolina Zmitrowitz (Poland).

It is our concern to recognize the pioneering merits of Erik van Veenendaal who has designed the first version of this Glossary and who conducted the Glossary Working Group during many years, from its beginnings until 2014.

Our special thanks go to Nicholas Humphries for the development of the interactive application.

Many more people, who are not mentioned here by name, have contributed to different versions of this Glossary. The editors would like to thank them all for their contributions.

Definitions

abuse case: A use case in which some actors with malicious intent are causing harm to the system or to other actors.
See also: use case

acceptance criteria: The criteria that a component or system must satisfy in order to be accepted by a user, customer, or other authorized entity.
Reference: ISO 24765

acceptance testing: Formal testing with respect to user needs, requirements, and business processes conducted to determine whether or not a system satisfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system.
Reference: After ISO 24765
See also: user acceptance testing

accessibility testing: Testing to determine the ease by which users with disabilities can use a component or system.
Reference: Gerrard

accessibility: The degree to which a component or system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.
Reference: After ISO 25010

account harvesting: The process of obtaining user account information based on trial and error with the intention of using that information in a security attack.

accuracy testing: Testing to determine the accuracy of a software product.
See also: accuracy

accuracy: The capability of the software product to provide the right or agreed results or effects with the needed degree of precision.
Reference: ISO 9126
See also: functionality

acting (IDEAL): The phase within the IDEAL model where the improvements are developed, put into practice, and deployed across the organization. The acting phase consists of the activities: create solution, pilot/test solution, refine solution and implement solution.
See also: IDEAL

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

actual result: The behavior produced/observed when a component or system is tested.
Synonym: actual outcome

ad hoc reviewing: A review technique carried out by independent reviewers informally, without a structured process.
Reference: After ISO 20246

ad hoc testing: Testing carried out informally. No formal test preparation takes place, no recognized test design technique is used, there are no expectations for results and arbitrariness guides the test execution activity.

adaptability: The degree to which a component or system can be adapted for different or evolving hardware and software environments.
Reference: After ISO 25010

Agile Manifesto: A statement on the values that underpin Agile software development. The values are: individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, responding to change over following a plan.

Agile software development: A group of software development methodologies based on iterative incremental development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.

Agile testing: Testing practice for a project using Agile software development methodologies, incorporating techniques and methods, such as extreme programming (XP), treating development as the customer of testing and emphasizing the test-first design paradigm.

See also: test-driven development

alpha testing: Simulated or actual operational testing conducted in the developer's test environment, by roles outside the development organization.

analytical test strategy: A test strategy whereby the test team analyzes the test basis to identify the test conditions to cover.

analytical testing: Testing based on a systematic analysis of e.g., product risks or requirements.

analyzability: The degree to which an assessment can be made for a component or system of either the impact of one or more intended changes, the diagnosis of deficiencies or causes of failures, or the identification of parts to be modified.

Reference: After ISO 25010

anomaly: Any condition that deviates from expectation based on requirements specifications, design documents, user documents, standards, etc., or from someone's perception or experience. Anomalies may be found during, but not limited to, reviewing, testing, analysis, compilation, or use of software products or applicable documentation.

Reference: IEEE 1044

See also: defect, error, fault, failure, incident, problem

anti-malware: Software that is used to detect and inhibit malware. See also malware.

anti-pattern: Repeated action, process, structure or reusable solution that initially appears to be beneficial and is commonly used but is ineffective and/or counterproductive in practice.

API testing: Testing performed by submitting commands to the software under test using programming interfaces of the application directly.

API: Acronym for Application Programming Interface.

assessment report: A document summarizing the assessment results, e.g., conclusions, recommendations and findings.

See also: process assessment

assessor: A person who conducts an assessment. Any member of an assessment team.

atomic condition: A condition that cannot be decomposed, i.e., a condition that does not contain two or more single conditions joined by a logical operator (AND, OR, XOR).

attack vector: A path or means by which an attacker can gain access to a system for malicious purposes.

attack-based testing: An experience-based testing technique that uses software attacks to induce failures, particularly security related failures.

See also: fault attack

attacker: A person or process that attempts to access data, functions or other restricted areas of the system without authorization, potentially with malicious intent.

See also: hacker

attractiveness: The capability of the software product to be attractive to the user.

Reference: ISO 9126

See also: usability

audit: An independent examination of a work product, process, or set of processes that is performed by a third party to assess compliance with specifications, standards, contractual agreements, or other criteria.

Reference: After IEEE 1028

authentication: A procedure determining whether a person or a process is, in fact, who or what it is declared to be.

See also: authorization

authorization: Permission given to a user or process to access resources.

See also: authentication

automated testware: Testware used in automated testing, such as tool scripts.

automation code defect density: Defect density of a component of the test automation code.

See also: defect density

availability: The degree to which a component or system is operational and accessible when required for use.

Reference: After ISO 25010

balanced scorecard: A strategic tool for measuring whether the operational activities of a company are aligned with its objectives in terms of business vision and strategy.

See also: corporate dashboard, scorecard

behavior: The response of a component or system to a set of input values and preconditions.

benchmark test: (1) A standard against which measurements or comparisons can be made. (2) A test that is used to compare components or systems to each other or to a standard as in (1).

Reference: After IEEE 610

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.

beta testing: Simulated or actual operational testing conducted at an external site, by roles outside the development organization.

Synonym: field testing

big-bang testing: An integration test approach in which software elements, hardware elements, or both are combined all at once into a component or an overall system, rather than in stages.

Reference: After IEEE 610

See also: integration testing

black-box test technique: A procedure to derive and/or select test cases based on an analysis of the specification, either functional or non-functional, of a component or system without reference to its internal structure.

Synonym: black-box technique, specification-based technique, specification-based test technique

black-box testing: Testing, either functional or non-functional, without reference to the internal structure of the component or system.

Synonym: specification-based testing

blocked test case: A test case that cannot be executed because the preconditions for its execution are not fulfilled.

botnet: A network of compromised computers, called bots or robots, which is controlled by a third party and used to transmit malware or spam, or to launch attacks.

bottom-up testing: An incremental approach to integration testing where the lowest level components are tested first, and then used to facilitate the testing of higher level components. This process is repeated until the component at the top of the hierarchy is tested.

See also: integration testing

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

See also: boundary value

boundary value coverage: The coverage of boundary values.

boundary value: A minimum or maximum value of an ordered equivalence partition.

branch coverage: The coverage of branches.

branch testing: A white-box test design technique in which test cases are designed to execute branches.

branch: A transfer of control from one location to a different location in the code.

build verification test: (BVT) A set of automated tests which validates the integrity of each new build and verifies its key/core functionality, stability and testability. It is an industry practice when a high frequency of build releases occurs (e.g., Agile projects) and it is run on every new build before the build is released for further testing.

See also: regression testing, smoke test

burndown chart: A publicly displayed chart that depicts the outstanding effort versus time in an iteration. It shows the status and trend of completing the tasks of the iteration. The X-axis typically represents days in the sprint, while the Y-axis is the remaining effort (usually either in ideal engineering hours or story points).

business process-based testing: An approach to testing in which test cases are designed based on descriptions and/or knowledge of business processes.

call graph: An abstract representation of calling relationships between subroutines in a program.

Capability Maturity Model integration: (CMMi) A framework that describes the key elements of an effective product development and maintenance process. The Capability Maturity Model integration covers best-practices for planning, engineering and managing product development and maintenance.

Reference: CMMI

capture/playback tool: A type of test execution tool where inputs are recorded during manual testing in order to generate automated test scripts that can be executed later (i.e. replayed). These tools are often used to support automated regression testing.

Synonym: capture/replay tool, record/playback tool

capture/playback: A test automation approach, where inputs to the test object are recorded during manual testing in order to generate automated test scripts that could be executed later (i.e. replayed).

Synonym: capture/replay, record/playback

CASE: Acronym for Computer Aided Software Engineering.

CAST: Acronym for Computer Aided Software Testing.

See also: test automation

causal analysis: The analysis of defects to determine their root cause.

Reference: CMMI

cause-effect diagram: A graphical representation used to organize and display the interrelationships of various possible root causes of a problem. Possible causes of a real or potential defect or failure are organized in categories and subcategories in a horizontal tree-structure, with the (potential) defect or failure as the root node.

Reference: After Juran

Synonym: fishbone diagram, Ishikawa diagram

cause-effect graph: A graphical representation of inputs and/or stimuli (causes) with their associated outputs (effects), which can be used to design test cases.

cause-effect graphing: A black-box test design technique in which test cases are designed from cause-effect graphs.
Reference: BS 7925/2
Synonym: cause-effect analysis

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

change 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.
See also: configuration management

changeability: The capability of the software product to enable specified modifications to be implemented.
Reference: ISO 9126
See also: maintainability

checklist-based reviewing: A review technique guided by a list of questions or required attributes.
Reference: ISO 20246

checklist-based testing: An experience-based test technique whereby the experienced tester uses a high-level list of items to be noted, checked, or remembered, or a set of rules or criteria against which a product has to be verified.

classification tree method: A black-box test design technique in which test cases, described by means of a classification tree, are designed to execute combinations of representatives of input and/or output domains.
Reference: Grochtmann
See also: combinatorial testing

classification tree: A tree showing equivalence partitions hierarchically ordered, which is used to design test cases in the classification tree method.
See also: classification tree method

CLI testing: Testing performed by submitting commands to the software under test using a dedicated command-line interface.

CLI: Acronym for Command-Line Interface.

code coverage: An analysis method that determines which parts of the software have been executed (covered) by the test suite and which parts have not been executed, e.g., statement coverage, decision coverage or condition coverage.

codependent behavior: Excessive emotional or psychological dependence on another person, specifically in trying to change that person's current (undesirable) behavior while supporting them in continuing that behavior. For example, in software testing, complaining about late delivery to test and yet enjoying the necessary "heroism", working additional hours to make up time when delivery is running late, therefore reinforcing the lateness.

co-existence: The degree to which a component or system can perform its required functions while sharing an environment and resources with other components or systems without a negative impact on any of them.
Reference: After ISO 25010

collapsed decision table: A decision table in which combinations of inputs that are impossible or lead to the same outputs are merged into one column (rule), by setting the conditions that do not influence the outputs to don't care.

combinatorial testing: A black-box test design technique in which test cases are designed to execute specific combinations of values of several parameters.
See also: classification tree method, n-wise testing, pairwise testing, orthogonal array testing

commercial off-the-shelf: (COTS) A software product that is developed for the general market, i.e. for a large number of customers, and that is delivered to many customers in identical format.

Synonym: off-the-shelf software

compatibility: The degree to which a component or system can exchange information with other components or systems.

compiler: A computer program that translates programs expressed in a high-order language into their machine language equivalents.

Reference: ISO 24765

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

See also: cyclomatic complexity

compliance testing: Testing to determine the compliance of the component or system.

Synonym: conformance testing, regulation testing, standards testing

compliance: The capability of the software product to adhere to standards, conventions or regulations in laws and similar prescriptions.

Reference: IEEE 730

component integration testing: Testing performed to expose defects in the interfaces and interactions between integrated components.

Synonym: link testing

component specification: A description of a component's function in terms of its output values for specified input values under specified conditions, and required non-functional behavior (e.g., resource-utilization).

component testing: The testing of individual hardware or software components.

Reference: ISO 24765

Synonym: module testing, unit testing

component: A minimal part of a system that can be tested in isolation.

Synonym: module, unit

compound condition: Two or more single conditions joined by means of a logical operator (AND, OR or XOR), e.g., A>B AND C>1000.

Synonym: multiple condition

computer forensics: The practice of determining how a security attack has succeeded and assessing the damage caused.

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.

Synonym: branch condition coverage

condition outcome: The evaluation of a condition to True or False.

condition testing: A white-box test design technique in which test cases are designed to execute condition outcomes.

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

See also: condition testing

Synonym: branch condition

confidence interval: In managing project risks, the period of time within which a contingency action must be implemented in order to be effective in reducing the impact of the risk.

configuration item: An aggregation of work products that is designated for configuration management and treated as a single entity in the configuration management process.

Reference: ISO 24765

configuration management tool: A tool that provides support for the identification and control of configuration items, their status over changes and versions, and the release of baselines consisting of configuration items.

configuration management: A discipline applying technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.

Reference: ISO 24765

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

confirmation testing: Dynamic testing conducted after fixing defects with the objective to confirm that failures caused by those defects do not occur anymore.

Synonym: re-testing

consultative test strategy: A test strategy whereby the test team relies on the input of one or more key stakeholders to determine the details of the strategy.

consultative testing: Testing driven by the advice and guidance of appropriate experts from outside the test team (e.g., technology experts and/or business domain experts).

content-based model: A process model providing a detailed description of good engineering practices, e.g., test practices.

Synonym: content reference model

context of use: Users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a software product is used.

Reference: ISO 9241-11

continuous representation: A capability maturity model structure wherein capability levels provide a recommended order for approaching process improvement within specified process areas.

Reference: CMMI

contractual acceptance testing: Acceptance testing conducted to verify whether a system satisfies its contractual requirements.

control chart: A statistical process control tool used to monitor a process and determine whether it is statistically controlled. It graphically depicts the average value and the upper and lower control limits (the highest and lowest values) of a process.

Synonym: Shewhart chart

control flow analysis: A form of static analysis based on a control flow graph.

Control flow graph: An abstract representation of all possible control flows through a component or system.

control flow testing: A test technique in which test cases are designed on the basis of control flows.

See also: path testing, branch testing, condition testing, decision testing, statement testing

control flow: The sequence in which operations are performed during the execution of a test item.

Reference: ISO 29119

convergence metric: A metric that shows progress toward a defined criterion, e.g., convergence of the total number of tests executed to the total number of tests planned for execution.

conversion testing: Testing of software used to convert data from existing systems for use in replacement systems.
Synonym: migration testing

corporate dashboard: A dashboard-style representation of the status of corporate performance data.
See also: balanced scorecard, dashboard

cost of quality: The total costs incurred on quality activities and issues and often split into prevention costs, appraisal costs, internal failure costs and external failure costs.

coverage analysis: Measurement of achieved coverage to a specified coverage item during test execution referring to predetermined criteria to determine whether additional testing is required and if so, which test cases are needed.

coverage item: An attribute or combination of attributes that is derived from one or more test conditions by using a test technique that enables the measurement of the thoroughness of the test execution.
Reference: ISO 29119

coverage tool: A tool that provides objective measures of what structural elements, e.g., statements, branches have been exercised by a test suite.
Synonym: coverage measurement tool

coverage: The degree to which specified coverage items have been determined or have been exercised by a test suite expressed as a percentage.
Reference: After ISO 29119
Synonym: test coverage

critical success factor: An element necessary for an organization or project to achieve its mission. Critical success factors are the critical factors or activities required for ensuring the success.

Critical Testing Processes: (CTP) A content-based model for test process improvement built around twelve critical processes. These include highly visible processes, by which peers and management judge competence and mission-critical processes in which performance affects the company's profits and reputation.
See also: content-based model

cross-site scripting: (XSS) A vulnerability that allows attackers to inject malicious code into an otherwise benign website.
Reference: NIST.IR.7298

custom software: Software developed specifically for a set of users or customers. The opposite is commercial off-the-shelf software.
Synonym: bespoke software

custom tool: A software tool developed specifically for a set of users or customers.

cyclomatic complexity: The maximum number of linear, independent paths through a program. Cyclomatic complexity may be computed as $L - N + 2P$, where L = the number of edges/links in a graph, N = the number of nodes in a graph, P = the number of disconnected parts of the graph (e.g., a called graph or subroutine).
Reference: After McCabe
Synonym: cyclomatic number

daily build: A development activity whereby a complete system is compiled and linked every day (often overnight), so that a consistent system is available at any time including all latest changes.

dashboard: A representation of dynamic measurements of operational performance for some organization or activity, using metrics represented via metaphors such as visual dials, counters, and other devices resembling those on the dashboard of an automobile, so that the effects of events or activities can be easily understood and related to operational goals.
See also: corporate dashboard, scorecard

data definition: An executable statement where a variable is assigned a value.

data flow analysis: A form of static analysis based on the definition and usage of variables.

data flow coverage: The percentage of definition-use pairs that have been exercised by a test suite.

data flow testing: A white-box test design technique in which test cases are designed to execute definition-use pairs of variables.

data flow: An abstract representation of the sequence and possible changes of the state of data objects, where the state of an object is any of creation, usage, or destruction.

Reference: Beiser

data obfuscation: Data transformation that makes it difficult for a human to recognize the original data.

data privacy: The protection of personally identifiable information or otherwise sensitive information from undesired disclosure.

database integrity testing: Testing the methods and processes used to access and manage the data(base), to ensure access methods, processes and data rules function as expected and that during access to the database, data is not corrupted or unexpectedly deleted, updated or created.

data-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.

Reference: Fewster and Graham

See also: keyword-driven testing

dd-path: A path between two decisions of an algorithm, or two decision nodes of a corresponding graph, that includes no other decisions.

See also: path

debugging tool: A tool used by programmers to reproduce failures, investigate the state of programs and find the corresponding defect. Debuggers enable programmers to execute programs step by step, to halt a program at any program statement and to set and examine program variables.

Synonym: debugger

debugging: The process of finding, analyzing and removing the causes of failures in software.

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

decision condition testing: A white-box test design technique in which test cases are designed to execute condition outcomes and decision outcomes.

decision coverage: The coverage of decision outcomes.

decision outcome: The result of a decision that determines the next statement to be executed.

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

Reference: Egler63

See also: decision table

decision table: A table used to show sets of conditions and the actions resulting from them.

Reference: ISO 24765

Synonym: cause-effect decision table

decision testing: A white-box test technique in which test cases are designed to execute decision outcomes.

decision: A type of statement in which a choice between two or more possible outcomes controls which set of actions will result.

Reference: ISO 29119

defect density: The number of defects per unit size of a work product.

Reference: After ISO 24765

Synonym: fault density

defect detection percentage: (DDP) The number of defects found by a test level, divided by the number found by that test level and any other means afterwards.

See also: escaped defect

Synonym: Fault Detection Percentage (FDP)

defect management committee: A cross-functional team of stakeholders who manage reported defects from initial detection to ultimate resolution (defect removal, defect deferral, or report cancellation). In some cases, the same team as the configuration control board.

Synonym: defect triage committee

defect management tool: A tool that facilitates the recording and status tracking of defects.

See also: incident management tool

Synonym: bug tracking tool, defect tracking tool

defect management: The process of recognizing and recording defects, classifying them, investigating them, taking action to resolve them, and disposing of them when resolved.

See also: incident management

defect masking: An occurrence in which one defect prevents the detection of another.

Reference: After IEEE 610

Synonym: fault masking

defect report: Documentation of the occurrence, nature, and status of a defect.

See also: incident report

Synonym: bug report

defect taxonomy: A system of (hierarchical) categories designed to be a useful aid for reproducibly classifying defects.

Synonym: bug taxonomy

defect: An imperfection or deficiency in a work product where it does not meet its requirements or specifications.

Reference: After IEEE 1044

Synonym: bug, fault

defect-based test design technique: A procedure to derive and/or select test cases targeted at one or more defect types, with tests being developed from what is known about the specific defect type.

See also: defect taxonomy

Synonym: defect-based technique

definition-use pair: The association of a definition of a variable with the subsequent use of that variable. Variable uses include computational (e.g., multiplication) or to direct the execution of a path (predicate use).

demilitarized zone: (DMZ) A physical or logical subnetwork that contains and exposes an organization's external-facing services to an untrusted network, commonly the Internet.

See also: network zone

Deming cycle: An iterative four-step problem-solving process (plan-do-check-act) typically used in process improvement.

Reference: After Deming

denial of service: (DOS) A security attack that is intended to overload the system with requests such that legitimate requests cannot be serviced.

design-based testing: An approach to testing in which test cases are designed based on the architecture and/or detailed design of a component or system (e.g., tests of interfaces between components or systems).

desk checking: Testing of software or a specification by manual simulation of its execution.
See also: static testing

diagnosing (IDEAL): The phase within the IDEAL model where it is determined where one is, relative to where one wants to be. The diagnosing phase consists of the activities to characterize current and desired states and develop recommendations.
See also: IDEAL

discount usability testing: A test strategy for usability testing that puts emphasis on keeping costs down without compromising too much on the quality of the usability evaluation.

domain analysis: A black-box test design technique that is used to identify efficient and effective test cases when multiple variables can or should be tested together. It builds on and generalizes equivalence partitioning and boundary values analysis.
See also: boundary value analysis, equivalence partitioning

driver: A software component or test tool that replaces a component that takes care of the control and/or the calling of a component or system.
Reference: After TMap
Synonym: test driver

dynamic analysis tool: A tool that provides run-time information on the state of the software code. These tools are most commonly used to identify unassigned pointers, check pointer arithmetic and to monitor the allocation, use and de-allocation of memory and to flag memory leaks.

dynamic analysis: The process of evaluating behavior, e.g., memory performance, CPU usage, of a system or component during execution.
Reference: After IEEE 610

dynamic comparison: Comparison of actual and expected results, performed while the software is being executed, for example by a test execution tool.

dynamic testing: Testing that involves the execution of the software of a component or system.

effectiveness: Extent to which correct and complete goals are achieved.
Reference: ISO 9241
See also: efficiency

efficiency testing: Testing to determine the efficiency of a software product.

efficiency: Resources expended in relation to the extent with which users achieve specified goals.
Reference: ISO 9241
See also: effectiveness

elementary comparison testing: A black-box test design technique in which test cases are designed to execute combinations of inputs using the concept of modified condition / decision coverage.
Reference: TMap

embedded iterative model: A development lifecycle sub-model that applies an iterative approach to detailed design, coding and testing within an overall sequential model. In this case, the high-level design documents are prepared and approved for the entire project but the actual detailed design, code development and testing are conducted in iterations.

emotional intelligence: The ability, capacity, and skill to identify, assess, and manage the emotions of one's self, of others, and of groups.

emulator: A device, computer program, or system that accepts the same inputs and produces the same outputs as a given system.

Reference: IEEE 610

See also: simulator

encryption: The process of encoding information so that only authorized parties can retrieve the original information, usually by means of a specific decryption key or process.

entry criteria: The set of conditions for officially starting a defined task.

Reference: Gilb and Graham

Synonym: definition of ready

entry point: An executable statement or process step which defines a point at which a given process is intended to begin.

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

equivalence partition: A portion of the value domain of a data element related to the test object for which all values are expected to be treated the same based on the specification.

Synonym: equivalence class

equivalence partitioning: A black-box test technique in which test cases are designed to exercise equivalence partitions by using one representative member of each partition.

Reference: After ISO 29119

Synonym: partition testing

equivalent manual test effort: (EMTE) Effort required for running tests manually.

error guessing: A test technique in which tests are derived on the basis of the tester's knowledge of past failures, or general knowledge of failure modes.

Reference: ISO 29119

error tolerance: The ability of a system or component to continue normal operation despite the presence of erroneous inputs.

Reference: After IEEE 610

error: A human action that produces an incorrect result.

Reference: ISO 24765

Synonym: mistake

escaped defect: A defect that was not detected in a previous test level which is supposed to find such type of defects.

See also: defect detection percentage

establishing (IDEAL): The phase within the IDEAL model where the specifics of how an organization will reach its destination are planned. The establishing phase consists of the activities set priorities, develop approach and plan actions.

See also: IDEAL

ethical hacker: A security tester using hacker techniques.

European Foundation for Quality Management excellence model: (EFQM) A non-prescriptive framework for an organization's quality management system, defined and owned by the European Foundation for Quality Management, based on five 'Enabling' criteria (covering what an organization does), and four 'Results' criteria (covering what an organization achieves).

executable statement: A statement which, when compiled, is translated into object code, and which will be executed procedurally when the program is running and may perform an action on data.

exercised: A program element is said to be exercised by a test case when the input value causes the execution of that element, such as a statement, decision, or other structural element.

exhaustive testing: A test approach in which the test suite comprises all combinations of input values and preconditions.

Synonym: complete testing

exit criteria: The set of conditions for officially completing a defined task.

Reference: After Gilb and Graham

Synonym: completion criteria, test completion criteria, definition of done

exit point: An executable statement or process step which defines a point at which a given process is intended to cease.

expected result: The predicted observable behavior of a component or system executing under specified conditions, based on its specification or another source.

Reference: After ISO 29119

Synonym: expected outcome, predicted outcome

experience-based test technique: A procedure to derive and/or select test cases based on the tester's experience, knowledge and intuition.

Synonym: experience-based technique

experience-based testing: Testing based on the tester's experience, knowledge and intuition.

expert usability review: An informal usability review in which the reviewers are experts. Experts can be usability experts or subject matter experts, or both.

See also: informal review

exploratory testing: An approach to testing whereby the testers dynamically design and execute tests based on their knowledge, exploration of the test item and the results of previous tests.

Reference: After ISO 29119

Extreme Programming: (XP) A software engineering methodology used within Agile software development whereby core practices are programming in pairs, doing extensive code review, unit testing of all code, and simplicity and clarity in code.

See also: Agile software development

facilitator: The leader and main person responsible for an inspection or review process.

Reference: After IEEE 1028

See also: moderator

fail: A test is deemed to fail if its actual result does not match its expected result.

failover testing: Testing by simulating failure modes or actually causing failures in a controlled environment. Following a failure, the failover mechanism is tested to ensure that data is not lost or corrupted and that any agreed service levels are maintained (e.g., function availability or response times).

See also: recoverability testing

Failure Mode and Effect Analysis: (FMEA) A systematic approach to risk identification and analysis of identifying possible modes of failure and attempting to prevent their occurrence.

See also: Failure Mode, Effect and Criticality Analysis

Synonym: Software Failure Mode and Effect Analysis

Failure Mode, Effects, and Criticality Analysis: (FMECA) An extension of FMEA, as in addition to the basic FMEA, it includes a criticality analysis, which is used to chart the probability of failure modes against the severity of their consequences. The result highlights failure modes with relatively high probability and severity of consequences, allowing remedial effort to be directed where it will produce the greatest value.

See also: Failure Mode and Effect Analysis

Synonym: software failure mode

failure mode: The physical or functional manifestation of a failure. For example, a system in failure mode may be characterized by slow operation, incorrect outputs, or complete termination of execution.

Reference: IEEE 610

failure rate: The ratio of the number of failures of a given category to a given unit of measure.

Reference: ISO 24765

failure: An event in which a component or system does not perform a required function within specified limits.

Reference: After ISO 24765

false-negative result: A test result which fails to identify the presence of a defect that is actually present in the test object.

Synonym: false-pass result

false-positive result: A test result in which a defect is reported although no such defect actually exists in the test object.

Synonym: false-fail result

fault attack: Directed and focused attempt to evaluate a specific quality characteristic of a test object by attempting to force specific failures to occur. Usually focused on reliability or security.

See also: negative testing, security attack

Synonym: attack

fault injection: The process of intentionally adding defects to a system for the purpose of finding out whether the system can detect, and possibly recover from, a defect. Fault injection is intended to mimic failures that might occur in the field.

See also: fault tolerance

fault seeding tool: A tool for seeding (i.e., intentionally inserting) faults in a component or system.

Synonym: error seeding tool

fault seeding: The process of intentionally adding defects to those already in the component or system for the purpose of monitoring the rate of detection and removal, and estimating the number of remaining defects. Fault seeding is typically part of development (pre-release) testing and can be performed at any test level (component, integration, or system).

Reference: After IEEE 610

Synonym: bebugging, error seeding

fault tolerance: The capability of the software product to maintain a specified level of performance in cases of software faults (defects) or of infringement of its specified interface.

Reference: ISO 9126

See also: reliability, robustness

Fault Tree Analysis: (FTA) A technique used to analyze the causes of faults (defects). The technique visually models how logical relationships between failures, human errors, and external events can combine to cause specific faults to disclose.

Synonym: Software Fault Tree Analysis

feasible path: A path for which a set of input values and preconditions exists which causes it to be executed.

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

Reference: After IEEE 1008

Synonym: software feature

feature-driven development: An iterative and incremental software development process driven from a client-valued functionality (feature) perspective. Feature-driven development is mostly used in Agile software development.

See also: Agile software development

finding: A result of an evaluation that identifies some important issue, problem, or opportunity.

finite state machine: A computational model consisting of a finite number of states and transitions between those states, possibly with accompanying actions.

Reference: IEEE 610

firewall: A component or set of components that controls incoming and outgoing network traffic based on predetermined security rules.

formal review: A form of review that follows a defined process with a formally documented output.

Reference: ISO 20246

formative evaluation: A type of evaluation designed and used to improve the quality of a component or system, especially when it is still being designed.

See also: summative evaluation

frozen test basis: A test basis document that can only be amended by a formal change control process.

See also: baseline

Function Point Analysis: (FPA) Method aiming to measure the size of the functionality of an information system. The measurement is independent of the technology. This measurement may be used as a basis for the measurement of productivity, the estimation of the needed resources, and project control.

functional integration: An integration approach that combines the components or systems for the purpose of getting a basic functionality working early.

See also: integration testing

functional requirement: A requirement that specifies a function that a component or system must be able to perform.

Reference: ISO 24765

functional test design technique: Procedure to derive and/or select test cases based on an analysis of the specification of the functionality of a component or system without reference to its internal structure.

See also: black-box test design technique

functional testing: Testing conducted to evaluate the compliance of a component or system with functional requirements.

Reference: ISO 24765

See also: black-box testing

functionality testing: The process of testing to determine the functionality of a software product.

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

Reference: ISO 9126

Synonym: functionality

fuzz testing: A software testing technique used to discover security vulnerabilities by inputting massive amounts of random data, called fuzz, to the component or system.

Synonym: fuzzing

generic test automation architecture: Representation of the layers, components, and interfaces of a test automation architecture, allowing for a structured and modular approach to implement test automation.

Goal Question Metric: (GQM) An approach to software measurement using a three-level model conceptual level (goal), operational level (question) and quantitative level (metric).

GUI testing: Testing performed by interacting with the software under test via the graphical user interface.

GUI: Acronym for Graphical User Interface.

hacker: A person or organization who is actively involved in security attacks, usually with malicious intent.
See also: attacker

hardware-software integration testing: Testing performed to expose defects in the interfaces and interaction between hardware and software components.
See also: integration testing

hashing: Transformation of a variable length string of characters into a usually shorter fixed-length value or key. Hashed values, or hashes, are commonly used in table or database lookups. Cryptographic hash functions are used to secure data.

hazard analysis: A technique used to characterize the elements of risk. The result of a hazard analysis will drive the methods used for development and testing of a system.
See also: risk analysis

heuristic evaluation: A usability review technique that targets usability problems in the user interface or user interface design. With this technique, the reviewers examine the interface and judge its compliance with recognized usability principles (the "heuristics").

heuristic: A generally recognized rule of thumb that helps to achieve a goal.

high-level test case: A test case without concrete values for input data and expected results.
See also: low-level test case
Synonym: abstract test case, logical test case

horizontal traceability: The tracing of requirements for a test level through the layers of test documentation (e.g., test plan, test design specification, test case specification and test procedure specification or test script).

human-centered design: An approach to design that aims to make software products more usable by focusing on the use of the software products and applying human factors, ergonomics, and usability knowledge and techniques.
Reference: ISO 9241-210

hyperlink test tool: A tool used to check that no broken hyperlinks are present on a web site.

hyperlink: A pointer within a web page that leads to other web pages.

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 identification of all work products affected by a change, including an estimate of the resources needed to accomplish the change.
Reference: After ISO 24765

incident management tool: A tool that facilitates the recording and status tracking of incidents.
See also: defect management tool

incident management: The process of recognizing and recording incidents, classifying them, investigating them, taking action to resolve them, and disposing of them when resolved.

See also: defect management

incident report: Documentation of the occurrence, nature, and status of an incident.

Reference: ISO 29119

Synonym: deviation report, software test incident report, test incident report

incident: An event occurring that requires investigation.

Synonym: deviation, software test incident, test incident

incremental development model: A development lifecycle model in which the project scope is generally determined early in the project lifecycle, but time and cost estimates are routinely modified as the project team understanding of the product increases. The product is developed through a series of repeated cycles, each delivering an increment which successively adds to the functionality of the product.

Reference: After PMBOK

See also: iterative development model

incremental testing: Testing where components or systems are integrated and tested one or some at a time, until all the components or systems are integrated and tested.

independence of testing: Separation of responsibilities, which encourages the accomplishment of objective testing.

Reference: After DO-178b

indicator: A measure that provides an estimate or evaluation of specified attributes derived from a model with respect to defined information needs.

Reference: ISO 25040

infeasible path: A path that cannot be exercised by any set of possible input values.

informal group review: An informal review performed by three or more persons.

Reference: ISO 20246

See also: informal review

informal review: A type of review without a formal (documented) procedure.

Reference: ISO 20246

information assurance: Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. These measures include providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.

Reference: NIST.IR.7298

information security: The protection of information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide confidentiality, integrity, and availability.

Reference: NIST.IR.7298

Synonym: cybersecurity

initiating (IDEAL): The phase within the IDEAL model where the groundwork is laid for a successful improvement effort. The initiating phase consists of the activities: set context, build sponsorship and charter infrastructure.

See also: IDEAL

input value: An instance of an input.

See also: input

input: Data received by a component or system from an external source.

Reference: ISO 24765

insider threat: A security threat originating from within the organization, often by an authorized system user.

insourced testing: Testing performed by people who are co-located with the project team but are not fellow employees.

inspection: A type of formal review to identify issues in a work product, which provides measurement to improve the review process and the software development process.
Reference: After ISO 20246

installability testing: Testing the installability of a software product.
See also: portability testing

installability: The capability of the software product to be installed in a specified environment.
Reference: ISO 9126 .
See also: portability

installation guide: Supplied instructions on any suitable media, which guides the installer through the installation process. This may be a manual guide, step-by-step procedure, installation wizard, or any other similar process description.

installation wizard: Supplied software on any suitable media, which leads the installer through the installation process. It normally runs the installation process, provides feedback on installation results, and prompts for options.

instrumentation: The insertion of additional code into the program in order to collect information about program behavior during execution, e.g., for measuring code coverage.

instrumenter: A software tool used to carry out instrumentation.
Synonym: program instrumenter

intake test: A special instance of a smoke test to decide if the component or system is ready for detailed and further testing. An intake test is typically carried out at the start of the test execution phase.
See also: smoke test
Synonym: pretest

integration testing: Testing performed to expose defects in the interfaces and in the interactions between integrated components or systems.
See also: component integration testing, system integration testing

integration: The process of combining components or systems into larger assemblies.

interface testing: An integration test type that is concerned with testing the interfaces between components or systems.

interoperability testing: Testing to determine the interoperability of a software product.
See also: functionality testing
Synonym: compatibility testing

interoperability: The degree to which two or more components or systems can exchange information and use the information that has been exchanged.
Reference: After ISO 25010

intrusion detection system: (IDS) A system which monitors activities on the 7 layers of the OSI model from network to application level, to detect violations of the security policy.
See also: malware scanning

invalid testing: Testing using input values that should be rejected by the component or system.
See also: error tolerance, negative testing

isolation testing: Testing of individual components in isolation from surrounding components, with surrounding components being simulated by stubs and drivers, if needed.

iterative development model: A development lifecycle where a project is broken into a usually large number of iterations. An iteration is a complete development loop resulting in a release (internal or external) of an executable product, a subset of the final product under development, which grows from iteration to iteration to become the final product.

keyword-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.

See also: data-driven testing

Synonym: action word-driven testing

lead assessor: The person who leads an assessment. In some cases, for instance CMMi and TMMi when formal assessments are conducted, the lead assessor must be accredited and formally trained.

learnability: The capability of the software product to enable the user to learn its application.

Reference: ISO 9126

See also: usability

learning (IDEAL): The phase within the IDEAL model where one learns from experiences and improves one's ability to adopt new processes and technologies in the future. The learning phase consists of the activities: analyze and validate, and propose future actions.

See also: IDEAL

level of intrusion: The level to which a test object is modified by adjusting it for testability.

level test plan: A test plan that typically addresses one test level.

See also: test plan

lifecycle model: A description of the processes, workflows, and activities used in the development, delivery, maintenance, and retirement of a system.

Reference: CMMI

See also: software lifecycle

linear scripting: A simple scripting technique without any control structure in the test scripts.

load profile: A specification of the activity which a component or system being tested may experience in production. A load profile consists of a designated number of virtual users who process a defined set of transactions in a specified time period and according to a predefined operational profile.

See also: operational profile

load testing: A type of performance testing conducted to evaluate the behavior of a component or system under varying loads, usually between anticipated conditions of low, typical, and peak usage.

Reference: After ISO 29119

See also: performance testing, stress testing

low-level test case: A test case with concrete values for input data and expected results.

See also: high-level test case

Synonym: concrete test case

maintainability testing: Testing to determine the maintainability of a software product.

Synonym: serviceability testing

maintainability: The degree to which a component or system can be modified by the intended maintainers.

Reference: After ISO 25010

maintenance testing: Testing the changes to an operational system or the impact of a changed environment to an operational system.

maintenance: The process of modifying a component or system after delivery to correct defects, improve quality attributes, or adapt to a changed environment.

Reference: After ISO 14764

malware scanning: Static analysis aiming to detect and remove malicious code received at an interface.

See also: intrusion detection system

malware: Software that is intended to harm a system or its components.

management review: A systematic evaluation of software acquisition, supply, development, operation, or maintenance process, performed by or on behalf of management that monitors progress, determines the status of plans and schedules, confirms requirements and their system allocation, or evaluates the effectiveness of management approaches to achieve fitness for purpose.

Reference: After IEEE 610, IEEE 1028

man-in-the-middle attack: The interception, mimicking and/or altering and subsequent relaying of communications (e.g., credit card transactions) by a third party such that a user remains unaware of that third party's presence.

manufacturing-based quality: A view of quality, whereby quality is measured by the degree to which a product or service conforms to its intended design and requirements. Quality arises from the process(es) used.

Reference: After Garvin

See also: product-based quality, transcendent-based quality, user-based quality, value-based quality

master test plan: A test plan that is used to coordinate multiple test levels or test types.

See also: test plan

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

Reference: TMMi

maturity model: A structured collection of elements that describe certain aspects of maturity in an organization, and aid in the definition and understanding of an organization's processes. A maturity model often provides a common language, shared vision and framework for prioritizing improvement actions.

maturity: (1) The capability of an organization with respect to the effectiveness and efficiency of its processes and work practices.

(2) The degree to which a component or system meets needs for reliability under normal operation.

Reference: ISO 25010

MBT model: Any model used in model-based testing.

mean time between failures: (MTBF) The arithmetic mean (average) time between failures of a system. The MTBF is typically part of a reliability growth model that assumes the failed system is immediately repaired, as a part of a defect fixing process.

See also: reliability growth model

mean time to repair: (MTTR) The arithmetic mean (average) time a system will take to recover from any failure. This typically includes testing to insure that the defect has been resolved.

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

Reference: After ISO 25040

measurement scale: A scale that constrains the type of data analysis that can be performed on it.

Reference: ISO 14598

measurement: The process of assigning a number or category to an entity to describe an attribute of that entity.

Reference: After ISO 25040

memory leak: A memory access failure due to a defect in a program's dynamic store allocation logic that causes it to fail to release memory after it has finished using it, eventually causing the program and/or other concurrent processes to fail due to lack of memory.

methodical test strategy: A test strategy whereby the test team uses a pre-determined set of test conditions such as a quality standard, a checklist, or a collection of generalized, logical test conditions which may relate to a particular domain, application or type of testing.

methodical testing: Testing based on a standard set of tests, e.g., a checklist, a quality standard, or a set of generalized test cases.

metric: A measurement scale and the method used for measurement.

milestone: A point in time in a project at which defined (intermediate) deliverables and results should be ready.

mind map: A diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central keyword or idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing.

model coverage: The coverage of model elements.

model-based test strategy: A test strategy whereby the test team derives testware from models.

model-based testing: (MBT) Testing based on or involving models.

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

moderator: The leader and main person responsible for an inspection or other review process.
Synonym: inspection leader

modified condition / decision coverage: (MC/DC) The percentage of all single condition outcomes that independently affect a decision outcome that have been exercised by a test case suite. 100% modified condition / decision coverage implies 100% decision condition coverage.
Synonym: condition determination coverage, modified multiple condition coverage

modified condition / decision testing: A white-box test design technique in which test cases are designed to execute single condition outcomes that independently affect a decision outcome.
Synonym: condition determination testing, modified multiple condition testing

monitoring tool: A software tool or hardware device that runs concurrently with the component or system under test and supervises, records and/or analyzes the behavior of the component or system.
Reference: ISO 24765
See also: dynamic analysis tool

monkey testing: Testing by means of a random selection from a large range of inputs and by randomly pushing buttons, ignorant of how the product is being used.

multiple condition 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.
Synonym: branch condition combination coverage, condition combination coverage

multiple condition testing: A white-box test design technique in which test cases are designed to execute combinations of single condition outcomes (within one statement).
Synonym: branch condition combination testing, condition combination testing

mutation analysis: A method to determine test suite thoroughness by measuring the extent to which a test suite can discriminate the program from slight variants (mutants) of the program.

mutation testing: Testing in which two or more variants of a component or system are executed with the same inputs, the outputs compared, and analyzed in cases of discrepancies.

Synonym: back-to-back testing

Myers-Briggs Type Indicator: (MBTI) An indicator of psychological preference representing the different personalities and communication styles of people.

negative testing: Tests aimed at showing that a component or system does not work. Negative testing is related to the tester's attitude rather than a specific test approach or test design technique, e.g., testing with invalid input values or exceptions.

Reference: After Beizer.

Synonym: dirty testing

neighborhood integration testing: A form of integration testing where all of the nodes that connect to a given node are the basis for the integration testing.

network zone: A sub-network with a defined level of trust. For example, the Internet or a public zone would be considered to be untrusted.

non-conformity: Non-fulfillment of a specified requirement.

Reference: ISO 9000

non-functional requirement: A requirement that describes how the component or system will do what it is intended to do.

Reference: After ISO 24765

non-functional test design technique: Procedure to derive and/or select test cases for non-functional testing based on an analysis of the specification of a component or system without reference to its internal structure.

See also: black-box test design technique

non-functional testing: Testing conducted to evaluate the compliance of a component or system with non-functional requirements.

N-switch coverage: The percentage of sequences of N+1 transitions that have been exercised by a test suite.

Reference: Chow

Synonym: Chow's coverage metrics

N-switch testing: A form of state transition testing in which test cases are designed to execute all valid sequences of N+1 transitions.

Reference: Chow

See also: state transition testing

n-wise testing: A black-box test design technique in which test cases are designed to execute all possible discrete combinations of any set of n input parameters.

See also: combinatorial testing, orthogonal array testing, pairwise testing

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

online MBT: Model-based test approach whereby test cases are generated and executed simultaneously.

Synonym: on-the-fly MBT

open source tool: A software tool that is available to all potential users in source code form, usually via the internet. Its users are permitted, usually under license, to study, change, improve and, at times, to distribute the software.

operability: The capability of the software product to enable the user to operate and control it.

Reference: ISO 9126

See also: usability

operational acceptance testing: Operational testing in the acceptance test phase, typically performed in a (simulated) operational environment by operations and/or systems administration staff focusing on operational aspects, e.g., recoverability, resource-behavior, installability and technical compliance.

See also: operational testing

Synonym: production acceptance testing

operational environment: Hardware and software products installed at users' or customers' sites where the component or system under test will be used. The software may include operating systems, database management systems, and other applications.

operational profile testing: Statistical testing using a model of system operations (short duration tasks) and their probability of typical use.

Reference: Musa

operational profile: An actual or predicted pattern of use of the component or system.

operational profiling: The process of developing and implementing an operational profile.

See also: operational profile

operational testing: Testing conducted to evaluate a component or system in its operational environment.

Reference: IEEE 610

orthogonal array testing: A systematic way of testing all-pair combinations of variables using orthogonal arrays. It significantly reduces the number of all combinations of variables to test all pair combinations.

See also: combinatorial testing, n-wise testing, pairwise testing

orthogonal array: A 2-dimensional array constructed with special mathematical properties, such that choosing any two columns in the array provides every pair combination of each number in the array.

output value: An instance of an output.

See also: output

output: Data transmitted by a component or system to an external destination.

Reference: After ISO 24765

outsourced testing: Testing performed by people who are not co-located with the project team and are not fellow employees.

pair programming: An agile software development practice in which two programmers work together on one workstation.

Reference: extremeprogramming.org

pair testing: Two persons, e.g., two testers, a developer and a tester, or an end-user and a tester, working together to find defects. Typically, they share one computer and trade control of it while testing.

pairwise integration testing: A form of integration testing that targets pairs of components that work together, as shown in a call graph.

pairwise 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.

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

Pareto analysis: A statistical technique in decision making that is used for selection of a limited number of factors that produce significant overall effect. In terms of quality improvement, a large majority of problems (80%) are produced by a few key causes (20%).

pass/fail criteria: Decision rules used to determine whether a test item (function) or feature has passed or failed a test.

Reference: IEEE 829

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

password cracking: A security attack recovering secret passwords stored in a computer system or transmitted over a network.

Reference: after NIST.IR.7298

path coverage: The coverage of paths.

path sensitizing: Choosing a set of input values to force the execution of a given path.

path testing: A white-box test design technique in which test cases are designed to execute paths.

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

Synonym: control flow path

peer review: A form of review of work products performed by others qualified to do the same work.

Reference: After ISO 20246

penetration testing: A testing technique aiming to exploit security vulnerabilities (known or unknown) to gain unauthorized access.

performance efficiency: The degree to which a component or system uses time, resources and capacity when accomplishing its designated functions.

Reference: After ISO 25010

Synonym: performance, time behavior

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.

Reference: CMMI

Synonym: key performance indicator

performance profiling: The task of analyzing, e.g., identifying performance bottlenecks based on generated metrics, and tuning the performance of a software component or system using tools.

performance testing tool: A test tool that generates load for a designated test item and that measures and records its performance during test execution.

performance testing: Testing to determine the performance of a software product.

See also: efficiency testing

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

Reference: After IEEE 610

See also: efficiency

Synonym: performance, time behavior

perspective-based reading: A review technique whereby reviewers evaluate the work product from different viewpoints.

Reference: After ISO 20246

Synonym: perspective-based reviewing

pharming: A security attack intended to redirect a web site's traffic to a fraudulent web site without the user's knowledge or consent.

phase containment: The percentage of defects that are removed in the same phase of the software lifecycle in which they were introduced.

phase test plan: A test plan that typically addresses one test phase.
See also: test plan

phishing: An attempt to acquire personal or sensitive information by masquerading as a trustworthy entity in an electronic communication.

planning poker: A consensus-based estimation technique, mostly used to estimate effort or relative size of user stories in Agile software development. It is a variation of the Wideband Delphi method using a deck of cards with values representing the units in which the team estimates.
See also: Agile software development, Wideband Delphi

pointer: A data item that specifies the location of another data item. For example, a data item that specifies the address of the next employee record to be processed.
Reference: IEEE 610

portability testing: Testing to determine the portability of a software product.
Synonym: configuration testing

portability: The ease with which the software product can be transferred from one hardware or software environment to another.
Reference: ISO 9126

postcondition: The expected state of a test item and its environment at the end of test case execution.

post-execution comparison: Comparison of actual and expected results, performed after the software has finished running.

precondition: The required state of a test item and its environment prior to test case execution.

predicate: A statement that can evaluate to true or false and may be used to determine the control flow of subsequent decision logic.
See also: decision

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

PRISMA: A systematic approach to risk-based testing that employs product risk identification and analysis to create a product risk matrix based on likelihood and impact. Term is derived from Product RiSk MAnagement.

probe effect: The effect on the component or system by the measurement instrument when the component or system is being measured, e.g., by a performance testing tool or monitor. For example performance may be slightly worse when performance testing tools are being used.

problem: An unknown underlying cause of one or more incidents.
Reference: ISO 24765

process assessment: A disciplined evaluation of an organization's software processes against a reference model.
Reference: after ISO 15504

process cycle test: A black-box test design technique in which test cases are designed to execute business procedures and processes.
Reference: TMap
See also: procedure testing

process improvement: A program of activities designed to improve the performance and maturity of the organization's processes, and the result of such a program.
Reference: CMMI

process model: A framework wherein processes of the same nature are classified into a overall model, e.g., a test improvement model.

process reference model: A process model providing a generic body of best practices and how to improve a process in a prescribed step-by-step manner.

process: A set of interrelated activities, which transform inputs into outputs.
Reference: ISO 12207

process-compliant test strategy: A test strategy whereby the test team follows a set of predefined processes, whereby the processes address such items as documentation, the proper identification and use of the test basis and test oracle(s), and the organization of the test team.

process-compliant testing: Testing that follows a set of defined processes, e.g., defined by an external party such as a standards committee.
See also: standard-compliant testing

process-driven scripting: A scripting technique where scripts are structured into scenarios which represent use cases of the software under test. The scripts can be parameterized with test data.

product risk: A risk impacting the quality of a product.
See also: risk

product-based quality: A view of quality, wherein quality is based on a well-defined set of quality characteristics. These characteristics must be measured in an objective and quantitative way. Differences in the quality of products of the same type can be traced back to the way the specific quality characteristics have been implemented.
See also: manufacturing-based quality, quality characteristic, transcendent-based quality, user-based quality, value-based quality

project retrospective: A structured way to capture lessons learned and to create specific action plans for improving on the next project or next project phase.

project risk: A risk that impacts project success.
See also: risk

project: 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.
Reference: ISO 9000

pseudo-random: A series which appears to be random but is in fact generated according to some prearranged sequence.

qualification: The process of demonstrating the ability to fulfill specified requirements. Note the term "qualified" is used to designate the corresponding status.
Reference: ISO 9000

quality assurance: Part of quality management focused on providing confidence that quality requirements will be fulfilled.
Reference: ISO 9000

quality characteristic: A category of product attributes that bears on quality.
Reference: ISO 24765
Synonym: quality attribute, quality characteristic, software product characteristic, software quality characteristic

quality control: The operational techniques and activities, part of quality management, that are focused on fulfilling quality requirements.
Reference: after ISO 8402

quality function deployment: (QFD) A method to transform user demands into design quality, to deploy the functions forming quality, and to deploy methods for achieving the design quality into subsystems and component parts, and ultimately to specific elements of the manufacturing process.
Reference: Akao

quality gate: A special milestone in a project. Quality gates are located between those phases of a project strongly depending on the outcome of a previous phase. A quality gate includes a formal check of the documents of the previous phase.

quality management: Coordinated activities to direct and control an organization with regard to quality. Direction and control with regard to quality generally includes the establishment of the quality policy and quality objectives, quality planning, quality control, quality assurance and quality improvement.
Reference: ISO 9000

quality risk: A product risk related to a quality characteristic.
See also: quality characteristic, product risk

quality: The degree to which a component, system or process meets specified requirements and/or user/customer needs and expectations.
Reference: ISO 24765

RACI matrix: A matrix describing the participation by various roles in completing tasks or deliverables for a project or process. It is especially useful in clarifying roles and responsibilities. RACI is an acronym derived from the four key responsibilities most typically used: Responsible, Accountable, Consulted, and Informed.

random testing: A black-box test design technique where test cases are selected, possibly using a pseudo-random generation algorithm, to match an operational profile. This technique can be used for testing non-functional attributes such as reliability and performance.

Rational Unified Process: (RUP) A proprietary adaptable iterative software development process framework consisting of four project lifecycle phases: inception, elaboration, construction and transition.

reactive test strategy: A test strategy whereby the test team waits to design and implement tests until the software is received, reacting to the actual system under test.

reactive testing: Testing that dynamically responds to the system under test and test results being obtained. Typically reactive testing has a reduced planning cycle and the design and implementation test phases are not carried out until the test object is received.

reconnaissance: The exploration of a target area aiming to gain information that can be useful for an attack.
Synonym: footprinting

recoverability testing: Testing to determine the recoverability of a software product.
See also: reliability testing
Synonym: recovery testing

recoverability: The capability of the software product to re-establish a specified level of performance and recover the data directly affected in case of failure.
Reference: ISO 9126
See also: reliability

regression testing: Testing of a previously tested component or system following modification to ensure that defects have not been introduced or have been uncovered in unchanged areas of the software, as a result of the changes made.

regression: A degradation in the quality of a component or system due to a change.

regression-averse test strategy: A test strategy whereby the test team applies various techniques to manage the risk of regression such as functional and/or non-functional regression test automation at one or more levels.

regression-averse testing: Testing using various techniques to manage the risk of regression, e.g., by designing re-usable testware and by extensive automation of testing at one or more test levels.

regulatory acceptance testing: Acceptance testing conducted to verify whether a system conforms to relevant laws, policies and regulations.

release note: A document identifying test items, their configuration, current status and other delivery information delivered by development to testing, and possibly other stakeholders, at the start of a test execution phase.

Reference: After IEEE 829

Synonym: item transmittal report, test item transmittal report

reliability growth model: A model that shows the growth in reliability over time during continuous testing of a component or system as a result of the removal of defects that result in reliability failures.

reliability testing: Testing to determine the reliability of a software product.

reliability: The degree to which a component or system performs specified functions under specified conditions for a specified period of time.

Reference: After ISO 25010

replaceability: The capability of the software product to be used in place of another specified software product for the same purpose in the same environment.

Reference: ISO 9126

See also: portability

requirement: A provision that contains criteria to be fulfilled.

Reference: ISO 24765

requirements management tool: A tool that supports the recording of requirements, requirements attributes (e.g., priority, knowledge responsible) and annotation, and facilitates traceability through layers of requirements and requirements change management. Some requirements management tools also provide facilities for static analysis, such as consistency checking and violations to pre-defined requirements rules.

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

Reference: ISO 24765

requirements-based testing: An approach to testing in which test cases are designed based on test objectives and test conditions derived from requirements, e.g., tests that exercise specific functions or probe non-functional attributes such as reliability or usability.

resource utilization testing: The process of testing to determine the resource-utilization of a software product.

See also: efficiency testing

Synonym: storage testing

resource utilization: The capability of the software product to use appropriate amounts and types of resources, for example the amounts of main and secondary memory used by the program and the sizes of required temporary or overflow files, when the software performs its function under stated conditions.

Reference: After ISO 9126

See also: efficiency

Synonym: storage

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

See also: actual result, expected result

Synonym: outcome, test outcome, test result

resumption criteria: The criteria used to restart all or a portion of the testing activities that were suspended previously.

resumption requirements: The defined set of testing activities that must be repeated when testing is re-started after a suspension.

retrospective meeting: A meeting at the end of a project during which the project team members evaluate the project and learn lessons that can be applied to the next project.

Synonym: post-project meeting

review plan: A document describing the approach, resources and schedule of intended review activities. It identifies, amongst others: documents and code to be reviewed, review types to be used, participants, as well as entry and exit criteria to be applied in case of formal reviews, and the rationale for their choice. It is a record of the review planning process.

review tool: A tool that provides support to the review process. Typical features include review planning and tracking support, communication support, collaborative reviews and a repository for collecting and reporting of metrics.

review: A type of static testing during which a work product or process is evaluated by one or more individuals to detect issues and to provide improvements.

Reference: After IEEE 1028

reviewer: A participant in a review, who identifies issues in the work product.

Reference: After ISO 20246

Synonym: checker, inspector

risk analysis: The overall process of risk identification and risk assessment.

risk assessment: The process to examine identified risks and determine the risk level.

See also: product risk, project risk, risk, risk impact, risk level, risk likelihood

risk identification: The process of finding, recognizing and describing risks.

Reference: ISO 31000

risk impact: The damage that will be caused if the risk becomes an actual outcome or event.

Synonym: impact

risk level: The qualitative or quantitative measure of a risk defined by impact and likelihood.

Synonym: risk exposure

risk likelihood: The estimated probability that a risk will become an actual outcome or event.

Synonym: likelihood

risk management: The coordinated activities to direct and control an organization with regard to risk.

Reference: ISO 31000

risk mitigation: The process through which decisions are reached and protective measures are implemented for reducing or maintaining risks to specified levels.

Synonym: risk control

risk type: A set of risks grouped by one or more common factors.

Synonym: risk category

risk: A factor that could result in future negative consequences.

risk-based testing: Testing in which the management, selection, prioritization, and use of testing activities and resources are based on corresponding risk types and risk levels.

Reference: After ISO 29119

robustness testing: Testing to determine the robustness of the software product.

robustness: The degree to which a component or system can function correctly in the presence of invalid inputs or stressful environmental conditions.

Reference: ISO 24765

See also: error-tolerance, fault-tolerance

role-based reviewing: A review technique where reviewers evaluate a work product from the perspective of different stakeholder roles.

Reference: After ISO 20246

root cause analysis: An analysis technique aimed at identifying the root causes of defects. By directing corrective measures at root causes, it is hoped that the likelihood of defect recurrence will be minimized.

Synonym: causal analysis

root cause: A source of a defect such that if it is removed, the occurrence of the defect type is decreased or removed.

Reference: CMMI

S.M.A.R.T. goal methodology: (SMART) A methodology whereby objectives are defined very specifically rather than generically. SMART is an acronym derived from the attributes of the objective to be defined: Specific, Measurable, Attainable, Relevant and Timely.

safety critical system: A system whose failure or malfunction may result in death or serious injury to people, or loss or severe damage to equipment, or environmental harm.

safety testing: Testing to determine the safety of a software product.

safety: The capability that a system will not, under defined conditions, lead to a state in which human life, health, property, or the environment is endangered.

Reference: After ISO 24765

salting: A cryptographic technique that adds random data (salt) to the user data prior to hashing.

See also: hashing

scalability testing: Testing to determine the scalability of the software product.

scalability: The capability of the software product to be upgraded to accommodate increased loads.

Reference: After Gerrard

scenario-based reviewing: A review technique where the review is guided by determining the ability of the work product to address specific scenarios.

Reference: ISO 20246

scorecard: A representation of summarized performance measurements representing progress towards the implementation of long-term goals. A scorecard provides static measurements of performance over or at the end of a defined interval.

See also: balanced scorecard, dashboard

scribe: A person who records information during the review meetings.

Reference: After IEEE 1028

Synonym: recorder

script kiddie: A person who executes security attacks that have been created by other hackers rather than creating one's own attacks.

See also: hacker

scripted testing: Test execution carried out by following a previously documented sequence of tests.

scrum: An iterative incremental framework for managing projects commonly used with Agile software development.

See also: Agile software development

security attack: An attempt to gain unauthorized access to a system or component, resources, information, or an attempt to compromise system integrity.

Reference: after NIST.IR.7298

security audit: An audit evaluating an organization's security processes and infrastructure.

security policy: A high-level document describing the principles, approach and major objectives of the organization regarding security.

security procedure: A set of steps required to implement the security policy and the steps to be taken in response to a security incident.

security testing tool: A tool that provides support for testing security characteristics and vulnerabilities.

security testing: Testing to determine the security of the software product.
See also: functionality testing

security tool: A tool that supports operational security.

security vulnerability: A weakness in the system that could allow for a successful security attack.

security: The degree to which a component or system protects information and data so that persons or other components or systems have the degree of access appropriate to their types and levels of authorization.
Reference: After ISO 25010

sequential development model: A type of development lifecycle model in which a complete system is developed in a linear way of several discrete and successive phases with no overlap between them.

session-based test management: A method for measuring and managing session-based testing, e.g., exploratory testing.

session-based testing: An approach to testing in which test activities are planned as uninterrupted sessions of test design and execution, often used in conjunction with exploratory testing.

severity: The degree of impact that a defect has on the development or operation of a component or system.

short-circuiting: A programming language/interpreter technique for evaluating compound conditions in which a condition on one side of a logical operator may not be evaluated if the condition on the other side is sufficient to determine the final outcome.

simulation: The representation of selected behavioral characteristics of one physical or abstract system by another system.
Reference: ISO 2382

simulator: 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.
Reference: ISO 24765
See also: emulator

smoke test: A subset of all defined/planned test cases that cover the main functionality of a component or system, to ascertain that the most crucial functions of a program work, but not bothering with finer details.
See also: build, verification test, intake test
Synonym: confidence test, sanity test

social engineering: An attempt to trick someone into revealing information (e.g., a password) that can be used to attack systems or networks.
Reference: NIST.IR.7298

software development lifecycle: The activities performed at each stage in software development, and how they relate to one another logically and chronologically.

software integrity level: The degree to which software complies or must comply with a set of stakeholder-selected software and/or software-based system characteristics (e.g., software complexity, risk assessment, safety level, security level, desired performance, reliability or cost) which are defined to reflect the importance of the software to its stakeholders.

software lifecycle: The period of time that begins when a software product is conceived and ends when the software is no longer available for use. The software lifecycle typically includes a concept phase, requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase, and sometimes, retirement phase. Note these phases may overlap or be performed iteratively.

software process improvement: (SPI) A program of activities designed to improve the performance and maturity of the organization's software processes and the results of such a program.

Reference: After CMMI

software quality: The totality of functionality and features of a software product that bear on its ability to satisfy stated or implied needs.

Reference: After ISO 9126

See also: quality

Software Usability Measurement Inventory: (SUMI) A questionnaire-based usability test technique for measuring software quality from the end user's point of view.

Reference: Kirakowski93

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

Reference: ISO 24765

specification: 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.

Reference: After IEEE 610

specified input: An input for which the specification predicts a result.

SQL injection: A security attack inserting malicious SQL statements into an entry field for execution.

stability: The degree to which a component or system can be effectively and efficiently modified without introducing defects or degrading existing product quality.

Reference: ISO 25010

staged representation: A model structure wherein attaining the goals of a set of process areas establishes a maturity level; each level builds a foundation for subsequent levels.

standard: 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).

Reference: After CMMI

standard-compliant test strategy: A test strategy whereby the test team follows a standard. Standards followed may be valid e.g., for a country (legislation standards), a business domain (domain standards), or internally (organizational standards).

standard-compliant testing: Testing that complies to a set of requirements defined by a standard, e.g., an industry testing standard or a standard for testing safety-critical systems.

See also: process-compliant testing

state diagram: 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.

Reference: After ISO 24765

Synonym: state transition diagram

state table: A grid showing the resulting transitions for each state combined with each possible event, showing both valid and invalid transitions.

state transition testing: A black-box test technique using a state transition diagram or state table to derive test cases to evaluate whether the test item successfully executes valid transitions and blocks invalid transitions.

See also: N-switch testing

Synonym: finite state testing

state transition: A transition between two states of a component or system.

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

statement testing: A white-box test technique in which test cases are designed to execute statements.

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

Synonym: source statement

static analysis: The process of evaluating a component or system without executing it, based on its form, structure, content, or documentation.

Reference: After ISO 24765

static analyzer: A tool that carries out static analysis.

Synonym: analyzer, static analysis tool

static code analysis: Analysis of source code carried out without execution of that software.

static testing: Testing a work product without code being executed.

statistical testing: A test design technique in which a model of the statistical distribution of the input is used to construct representative test cases.

See also: operational profile testing

status accounting: An element of configuration management consisting of the recording and reporting of information needed to manage a configuration effectively. This information includes a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of the approved changes.

Reference: IEEE 610

stress testing tool: A tool that supports stress testing.

stress testing: A type of performance testing conducted to evaluate a system or component at or beyond the limits of its anticipated or specified workloads, or with reduced availability of resources such as access to memory or servers.

Reference: ISO 24765

See also: performance testing, load testing

structural coverage: Coverage measures based on the internal structure of a component or system.

structured scripting: A scripting technique that builds and utilizes a library of reusable (parts of) scripts.

stub: A skeletal or special-purpose implementation of a software component, used to develop or test a component that calls or is otherwise dependent on it. It replaces a called component.

Reference: After IEEE 610

subpath: A sequence of executable statements within a component.

suitability testing: Testing to determine the suitability of a software product.

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

Reference: ISO 9126

See also: functionality

summative evaluation: A type of evaluation designed and used to gather conclusions about the quality of a component or system, especially when a substantial part of it has completed design.

See also: formative evaluation, testing

suspension criteria: The criteria used to (temporarily) stop all or a portion of the testing activities on the test items.

Reference: After IEEE 829

syntax testing: A black-box test design technique in which test cases are designed based upon the definition of the input domain and/or output domain.

system hardening: The step-by-step process of reducing the security vulnerabilities of a system by applying a security policy and different layers of protection.

system integration testing: Testing the combination and interaction of systems.

system of systems: Multiple heterogeneous, distributed systems that are embedded in networks at multiple levels and in multiple interconnected domains, addressing large-scale inter-disciplinary common problems and purposes, usually without a common management structure.

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

Reference: Hetzel

system under test: (SUT) A type of test object that is a system.

System Usability Scale: (SUS) A simple, ten-item attitude scale giving a global view of subjective assessments of usability.

system: A collection of interacting elements organized to accomplish a specific function or set of functions.

Reference: After ISO 24765

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

See also: content-based model

technical review: A formal review type by a team of technically-qualified personnel that examines the suitability of a work product for its intended use and identifies discrepancies from specifications and standards.

Reference: Gilb and Graham, IEEE 1028

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 analysis: The activity that identifies test conditions by analyzing the test basis.

test approach: The implementation of the test strategy for a specific project.

test architect: (1) A person who provides guidance and strategic direction for a test organization and for its relationship with other disciplines. (2) A person who defines the way testing is structured for a given system, including topics such as test tools and test data management.

test automation architecture: An instantiation of the generic test automation architecture to define the architecture of a test automation solution, i.e., its layers, components, services and interfaces.

test automation engineer: A person who is responsible for the design, implementation and maintenance of a test automation architecture as well as the technical evolution of the resulting test automation solution.

test automation framework: A tool that provides an environment for test automation. It usually includes a test harness and test libraries.

test automation manager: A person who is responsible for the planning and supervision of the development and evolution of a test automation solution.

test automation solution: A realization/implementation of a test automation architecture, i.e., a combination of components implementing a specific test automation assignment. The components may include commercial off-the-shelf test tools, test automation frameworks, as well as test hardware.

test automation strategy: A high-level plan to achieve long-term objectives of test automation under given boundary conditions.

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: The body of knowledge used as the basis for test analysis and design.
Reference: After TMap

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 case result: The final verdict on the execution of a test and its outcomes, such as pass, fail, or error. The result of error is used for situations where it is not clear whether the problem is in the test object.

test case specification: Documentation of a set of one or more test cases.
Reference: ISO 29119
See also: test specification

test case: A set of preconditions, inputs, actions (where applicable), expected results and postconditions, developed based on test conditions.
Reference: After ISO 29119

test charter: Documentation of test activities in session-based exploratory testing.
See also: exploratory testing
Synonym: charter

test closure: During the test closure phase of a test process data is collected from completed activities to consolidate experience, testware, facts and numbers. The test closure phase consists of finalizing and archiving the testware and evaluating the test process, including preparation of a test evaluation report.
See also: test process

test comparator: A test tool to perform automated test comparison of actual results with expected results.
Synonym: comparator

test comparison: The process of identifying differences between the actual results produced by the component or system under test and the expected results for a test. Test comparison can be performed during test execution (dynamic comparison) or after test execution.

test completion: The activity that makes test assets available for later use, leaves test environments in a satisfactory condition and communicates the results of testing to relevant stakeholders.
Reference: After ISO 29119

test condition: An aspect of the test basis that is relevant in order to achieve specific test objectives.
Synonym: test requirement, test situation

test control: A test management task that deals with developing and applying a set of corrective actions to get a test project on track when monitoring shows a deviation from what was planned.
See also: test management

test cycle: Execution of the test process against a single identifiable release of the test object.

test data management: The process of analyzing test data requirements, designing test data structures, creating and maintaining test data.

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

test data: Data created or selected to satisfy the execution preconditions and inputs to execute one or more test cases.
Reference: After ISO 29119

test definition layer: The layer in a generic test automation architecture which supports test implementation by supporting the definition of test suites and/or test cases, e.g., by offering templates or guidelines.

test design specification: Documentation specifying the features to be tested and their corresponding test conditions.
Reference: ISO 29119
See also: test specification

test design tool: A tool that supports the test design activity by generating test inputs from a specification that may be held in a CASE tool repository, e.g., requirements management tool, from specified test conditions held in the tool itself, or from code.

test design: The activity of deriving and specifying test cases from test conditions.
Reference: After ISO 29119
See also: test design specification

test director: A senior manager who manages test managers.
See also: test manager

test environment: An environment containing hardware, instrumentation, simulators, software tools, and other support elements needed to conduct a test.
Reference: ISO 24765
Synonym: test bed, test rig

test estimation: The calculated approximation of a result related to various aspects of testing (e.g., effort spent, completion date, costs involved, number of test cases, etc.) which is usable even if input data may be incomplete, uncertain, or noisy.

test evaluation report: A document produced at the end of the test process summarizing all testing activities and results. It also contains an evaluation of the test process and lessons learned.

test execution automation: The use of software, e.g., capture/playback tools, to control the execution of tests, the comparison of actual results to expected results, the setting up of test preconditions, and other test control and reporting functions.

test execution layer: The layer in a generic test automation architecture which supports the execution of test suites and/or test cases.

test execution phase: The period of time in a software development lifecycle during which the components of a software product are executed, and the software product is evaluated to determine whether or not requirements have been satisfied.
Reference: IEEE 610

test execution schedule: A schedule for the execution of test suites within a test cycle.

test execution technique: The method used to perform the actual test execution, either manual or automated.

test execution tool: A test tool that executes tests against a designated test item and evaluates the outcomes against expected results and postconditions.

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

test generation layer: The layer in a generic test automation architecture which supports manual or automated design of test suites and/or test cases.

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

test hook: A customized software interface that enables automated testing of a test object.

test implementation: The activity that prepares the testware needed for test execution based on test analysis and design.

test improvement plan: A plan for achieving organizational test process improvement objectives based on a thorough understanding of the current strengths and weaknesses of the organization's test processes and test process assets.
Reference: After CMMI

test infrastructure: The organizational artifacts needed to perform testing, consisting of test environments, test tools, office environment and procedures.

test input: The data received from an external source by the test object during test execution. The external source can be hardware, software or human.

test item: A part of a test object used in the test process.
See also: test object

test leader: On large projects, the person who reports to the test manager and is responsible for project management of a particular test level or a particular set of testing activities.
See also: test manager
Synonym: lead tester

test level: A specific instantiation of a test process.
Reference: After ISO 29119
Synonym: test stage

test log: A chronological record of relevant details about the execution of tests.
Reference: ISO 24765
Synonym: test record, test run log

test logging: The activity of creating a test log.
Synonym: test recording

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 management: The planning, scheduling, estimating, monitoring, reporting, control and completion of test activities.
Reference: ISO 29119

test manager: 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 Maturity Model integration: (TMMi) A five-level staged framework for test process improvement, related to the Capability Maturity Model integration (CMMi), that describes the key elements of an effective test process.

test mission: The purpose of testing for an organization, often documented as part of the test policy.
See also: test policy

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

test monitoring: A test management activity that involves checking the status of testing activities, identifying any variances from the planned or expected status, and reporting status to stakeholders.

See also: test management

test object: The component or system to be tested.

See also: test item

test objective: A reason or purpose for designing and executing a test.

test oracle: A source to determine expected results to compare with the actual result of the system under test.

Reference: After Adrion

Synonym: oracle

test performance indicator: A high-level metric of effectiveness and/or efficiency used to guide and control progressive test development, e.g., Defect Detection Percentage (DDP).

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

Reference: After Gerrard

test plan: Documentation describing the test objectives to be achieved and the means and the schedule for achieving them, organized to coordinate testing activities.

Reference: After ISO 29119

test planning: The activity of establishing or updating a test plan.

Test Point Analysis: (TPA) A formula based test estimation method based on function point analysis.

Reference: TMap

test policy: A high-level document describing the principles, approach and major objectives of the organization regarding testing.

Synonym: organizational test policy

test procedure specification: Documentation specifying one or more test procedures.

Reference: After ISO 29119

See also: test specification

Synonym: test procedure, test scenario

test procedure: A sequence of test cases in execution order, and any associated actions that may be required to set up the initial preconditions and any wrap up activities post execution.

Reference: ISO 29119

See also: test script

test process group: (TPG) A collection of (test) specialists who facilitate the definition, maintenance, and improvement of the test processes used by an organization.

Reference: After CMMI

test process improvement manifesto: A statement that echoes the Agile manifesto, and defines values for improving the testing process. The values are: flexibility over detailed processes, best practices over templates, deployment orientation over process orientation, peer reviews over quality assurance (departments), business driven over model-driven.

Reference: Veenendaal08

test process improvement: A program of activities designed to improve the performance and maturity of the organization's test processes and the results of such a program.

Reference: After CMMI

test process improver: A person implementing improvements in the test process based on a test improvement plan.

test process: The set of interrelated activities comprising of test planning, test monitoring and control, test analysis, test design, test implementation, test execution, and test completion.

test progress report: A test report produced at regular intervals about the progress of test activities against a baseline, risks, and alternatives requiring a decision.
Synonym: test status report

test report: Documentation summarizing test activities and results.

test reporting: Collecting and analyzing data from testing activities and subsequently consolidating the data in a report to inform stakeholders.

See also: test process

test reproducibility: An attribute of a test indicating whether the same results are produced each time the test is executed.

test run: Execution of a test on a specific version of the test object.

test schedule: A list of activities, tasks or events of the test process, identifying their intended start and finish dates and/or times, and interdependencies.

test script: A sequence of instructions for the execution of a test.

See also: test procedure

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 session: An uninterrupted period of time spent in executing tests. In exploratory testing, each test session is focused on a charter, but testers can also explore new opportunities or issues during a session. The tester creates and executes on the fly and records their progress.

See also: exploratory testing

test specification: The complete documentation of the test design, test cases and test procedures for a specific test item.

Reference: ISO 29119

test strategy: Documentation that expresses the generic requirements for testing one or more projects run within an organization, providing detail on how testing is to be performed, and is aligned with the test policy.

Reference: After ISO 29119

Synonym: organizational test strategy

test suite: A set of test cases or test procedures to be executed in a specific test cycle.

Synonym: test case suite, test set

test summary report: A test report that provides an evaluation of the corresponding test items against exit criteria.

Reference: ISO 29119

Synonym: test report

test technique: A procedure used to derive and/or select test cases.

Synonym: test case design technique, test specification technique, test technique, test design technique

test tool: 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.

Reference: TMap

See also: CAST

test type: A group of test activities based on specific test objectives aimed at specific characteristics of a component or system.

Reference: After TMap

test: A set of one or more test cases.

testability review: A review to evaluate the testability of the test basis.

Reference: After TMap

testability: The degree of effectiveness and efficiency with which tests can be designed and executed for a component or system.

Reference: After ISO 25010

testable requirement: A requirements that is stated in terms that permit establishment of test designs (and subsequently test cases) and execution of tests to determine whether the requirement has been met.

Reference: After IEEE 610

test-driven development: (TDD) A way of developing software where the test cases are developed, and often automated, before the software is developed to run those test cases.

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

test-first development: The practice of designing tests based on the specification of a test item before developing the corresponding test item.

See also: test-driven development

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.

testware: Work products produced during the test process for use in planning, designing, executing, evaluating and reporting on testing.

Reference: After ISO 29119

think aloud usability testing: A usability testing technique where test participants share their thoughts with the moderator and observers by thinking aloud while they solve usability test tasks. Think aloud is useful to understand the test participant.

thread testing: An approach to component integration testing where the progressive integration of components follows the implementation of subsets of the requirements, as opposed to the integration of components by levels of a hierarchy.

three-point estimation: A test estimation method using estimated values for the "best case", "worst case", and "most likely case" of the matter being estimated, to define the degree of certainty associated with the resultant estimate.

top-down testing: An incremental approach to integration testing where the component at the top of the component hierarchy is tested first, with lower level components being simulated by stubs. Tested components are then used to test lower level components. The process is repeated until the lowest level components have been tested.

See also: integration testing

Total Quality Management: (TQM) An organization-wide management approach centered on quality, based on the participation of all members of the organization and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society. Total Quality Management consists of planning, organizing, directing, control, and assurance.

Reference: After ISO 8402

TPI Next: A continuous business-driven framework for test process improvement that describes the key elements of an effective and efficient test process.

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.

traceability: The degree to which a relationship can be established between two or more work products.

Reference: After ISO 19506

See also: horizontal traceability, vertical traceability

transactional analysis: The analysis of transactions between people and within people's minds; a transaction is defined as a stimulus plus a response. Transactions take place between people and between the ego states (personality segments) within one person's mind.

transcendent-based quality: A view of quality, wherein quality cannot be precisely defined, but we know it when we see it, or are aware of its absence when it is missing. Quality depends on the perception and affective feelings of an individual or group of individuals toward a product.

Reference: After Garvin

See also: manufacturing-based quality, product-based quality, user-based quality, value-based quality

understandability: 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.

Reference: ISO 9126

See also: usability

unit test framework: A tool that provides an environment for unit or component testing in which a component can be tested in isolation or with suitable stubs and drivers. It also provides other support for the developer, such as debugging capabilities.

Reference: Graham

unreachable code: Code that cannot be reached and therefore is impossible to execute.

Synonym: dead code

usability evaluation: A process through which information about the usability of a system is gathered in order to improve the system (known as formative evaluation) or to assess the merit or worth of a system (known as summative evaluation).

See also: formative evaluation, summative evaluation

usability requirement: A requirement on the usability of a component or system.

usability test participant: A representative user who solves typical tasks in a usability test.

usability test script: A document specifying a sequence of actions for the execution of a usability test. It is used by the moderator to keep track of briefing and pre-session interview questions, usability test tasks, and post-session interview questions.

See also: test procedure specification

usability test session: A test session in usability testing in which a usability test participant is executing tests, moderated by a moderator and observed by a number of observers.

usability test task: A usability test execution activity specified by the moderator that needs to be accomplished by a usability test participant within a given period of time.

usability testing: Testing to evaluate the degree to which the system can be used by specified users with effectiveness, efficiency and satisfaction in a specified context of use.

Reference: After ISO 25010

usability: Extent to which a software product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.

Reference: ISO 9241

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

Reference: ISO 9126

use case testing: A black-box test technique in which test cases are designed to execute scenarios of use cases.
Synonym: scenario testing, user scenario testing

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.

user acceptance testing: Acceptance testing conducted in a real or simulated operational environment by intended users focusing their needs, requirements and business processes.
See also: acceptance testing

user experience: A person's perceptions and responses resulting from the use or anticipated use of a software product.
Reference: ISO 9241-210

user interface guideline: A low-level, specific rule or recommendation for user interface design that leaves little room for interpretation so designers implement it similarly. It is often used to ensure consistency in the appearance and behavior of the user interface of the systems produced by an organization.

user interface: All components of a system that provide information and controls for the user to accomplish specific tasks with the system.

user story testing: A black-box test design technique in which test cases are designed based on user stories to verify their correct implementation.
See also: user story

user story: A high-level user or business requirement commonly used in Agile software development, typically consisting of one sentence in the everyday or business language capturing what functionality a user needs and the reason behind this, any non-functional criteria, and also includes acceptance criteria.
See also: Agile software development, requirement

user survey: A usability evaluation whereby a representative sample of users are asked to report subjective evaluation into a questionnaire based on their experience in using a component or system.

user test: A test whereby real-life users are involved to evaluate the usability of a component or system.

user-based quality: A view of quality, wherein quality is the capacity to satisfy needs, wants and desires of the user(s). A product or service that does not fulfill user needs is unlikely to find any users. This is a context dependent, contingent approach to quality since different business characteristics require different qualities of a product.
Reference: after Garvin
See also: manufacturing-based quality, product-based quality, transcendent-based quality, value-based quality

validation: Confirmation by examination and through provision of objective evidence that the requirements for a specific intended use or application have been fulfilled.
Reference: ISO 9000

value-based quality: A view of quality wherein quality is defined by price. A quality product or service is one that provides desired performance at an acceptable cost. Quality is determined by means of a decision process with stakeholders on trade-offs between time, effort and cost aspects.
Reference: After Garvin
See also: manufacturing-based quality, product-based quality, transcendent-based quality, user-based quality

variable: An element of storage in a computer that is accessible by a software program by referring to it by a name.

verification: Confirmation by examination and through provision of objective evidence that specified requirements have been fulfilled.
Reference: ISO 9000

vertical traceability: The tracing of requirements through the layers of development documentation to components.

V-model: A sequential development lifecycle model describing a one-for-one relationship between major phases of software development from business requirements specification to delivery, and corresponding test levels from acceptance testing to component testing.

volume testing: Testing where the system is subjected to large volumes of data.
See also: resource-utilization testing

vulnerability scanner: A static analyzer that is used to detect particular security vulnerabilities in the code.

walkthrough: A type of review in which an author leads members of the review through a work product and the members ask questions and make comments about possible issues.

Reference: After ISO 20246

See also: peer review

Synonym: structured walkthrough

Web Content Accessibility Guidelines: (WCAG) A part of a series of web accessibility guidelines published by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C), the main international standards organization for the internet. They consist of a set of guidelines for making content accessible, primarily for people with disabilities.

Website Analysis and Measurement Inventory: (WAMMI) A questionnaire-based usability test technique for measuring web site software quality from the end user's point of view.

white-box test technique: A procedure to derive and/or select test cases based on an analysis of the internal structure of a component or system.

Synonym: structural test technique, structure-based technique, structure-based test technique, white-box technique

white-box testing: Testing based on an analysis of the internal structure of the component or system.

Synonym: clear-box testing, code-based testing, glass-box testing, logic-coverage testing, logic-driven testing, structural testing, structure-based testing

Wideband Delphi: An expert-based test estimation technique that aims at making an accurate estimation using the collective wisdom of the team members.

wild pointer: A pointer that references a location that is out of scope for that pointer or that does not exist.

See also: pointer

work breakdown structure: (WBS) Deliverable oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives (according to PMBOK).

Reference: PMBOK

Appendix A

Standards

- [BS 7925/2] BS 2925:2001, Software Component Testing Standard, BCS SIGIST Working Draft 3.4
- [DO-178b] DO-178B:1992. Software Considerations in Airborne Systems and Equipment Certification, Requirements and Technical Concepts for Aviation (RTCA SC167)
- [IEEE 610] IEEE 610.12:1990. Standard Glossary of Software Engineering Terminology.
- [IEEE 730] IEEE 730:2002. Software Quality Assurance Plans
- [IEEE 829] IEEE 829:1998. Standard for Software Test Documentation
- [IEEE 1008] IEEE 1008:1993. Standard for Software Unit Testing
- [IEEE 1028] IEEE 1028:1997. Standard for Software Reviews and Audits
- [IEEE 1044] IEEE 1044:1993. Standard Classification for Software Anomalies
- [IEEE 1219] IEEE 1219:1998. Software Maintenance
- [ISO 2382] ISO/IEC 2382-1:1993. Data processing - Vocabulary - Part 1: Fundamental terms
- [ISO 8402] ISO 8402: 1994. Quality Management and Quality Assurance Vocabulary
- [ISO 9000] ISO 9000:2005. Quality Management Systems – Fundamentals and Vocabulary
- [ISO 9126] ISO/IEC 9126-1:2001. Software Engineering – Software Product Quality – Part 1: Quality characteristics and sub-characteristics
- [ISO 9241] ISO 9241:2010. Ergonomics of human-system interaction – Part 210: Human-centered design for interactive systems
- [ISO 12207] ISO/IEC 12207:1995. Information Technology – Software Lifecycle Processes
- [ISO 14598] ISO/IEC 14598-1:1999. Information Technology – Software Product Evaluation - Part 1: General Overview
- [ISO 14764] ISO/IEC 14764:2006. Software Engineering - Software Life Cycle Processes - Maintenance
- [ISO 15504] ISO/IEC 15504-9: 1998. Information Technology – Software Process Assessment – Part 9: Vocabulary
- [ISO 19506] ISO/IEC 19506:2012. Information technology -- Object Management Group Architecture-Driven Modernization (ADM) -- Knowledge Discovery Meta-Model (KDM)
- [ISO 20246] ISO/IEC 20246:2017. Software and systems engineering -- Work product reviews
- [ISO 24765] ISO/IEC/IEEE 24765:2017. Systems and software engineering -- Vocabulary
- [ISO 25010] ISO/IEC 25010:2011. Systems and software engineering -- Systems and software Quality Requirements and Evaluation (SQuaRE) -- System and software quality models
- [ISO 25040] ISO/IEC 25040:2011. Systems and software engineering -- Systems and software Quality Requirements and Evaluation (SQuaRE) -- Evaluation process
- [ISO 29119] ISO/IEC/IEEE 29119-1:2013. Software and systems engineering -- Software testing -- Part 1: Concepts and definitions
- [ISO 31000] ISO 31000:2018. Risk management
- [NIST.IR.7298] U.S. Department of Commerce, National Institute of Standards and Technology – Glossary of Key Information Security Terms, Revision 2, May 2013

Books and papers

- [Adrion] W. Adrion, M. Branstad and J. Cherniabsky (1982), Validation, Verification and Testing of Computer Software, in: Computing Surveys, Vol. 14, No 2, June 1982
- [Akao] Akao, Yoji (1994), Development History of Quality Function Deployment - The Customer Driven Approach to Quality Planning and Deployment, Minato, Tokyo 107 Japan: Asian Productivity Organization, pp. 339, ISBN 92-833-1121-3
- [Bach] J. Bach (2004), Exploratory Testing, in: E. van Veenendaal, The Testing Practitioner – 2nd edition, UTN Publishing, ISBN 90-72194-65-9
- [Beizer] B. Beizer (1990), Software Testing Techniques, van Nostrand Reinhold, ISBN 0-442-20672-0
- [Chow] T. Chow (1978), Testing Software Design Modelled by Finite-State Machines, in: IEEE Transactions on Software Engineering, Vol. 4, No 3, May 1978
- [CMMI] M.B. Chrissis, M. Konrad and S. Shrum (2004), CMMi, Guidelines for Process Integration and Product Improvement, Addison Wesley, ISBN 0-321-15496-7
- [Deming] D. W. Edwards (1986), Out of the Crisis, MIT Center for Advanced Engineering Study, ISBN 0-911379-01-0
- [Egler63] J. F. Egler. 1963. A procedure for converting logic table conditions into an efficient sequence of test instructions. Commun. ACM 6, 9 (September 1963), 510-514.
DOI=10.1145/367593.367595
- [Fenton] N. Fenton (1991), Software Metrics: a Rigorous Approach, Chapman & Hall, ISBN 0-53249-425-1
- [Fewster and Graham] M. Fewster and D. Graham (1999), Software Test Automation, Effective use of test execution tools, Addison-Wesley, ISBN 0-201-33140-3
- [Freedman and Weinberg] D. Freedman and G. Weinberg (1990), Walkthroughs, Inspections, and Technical Reviews, Dorset House Publishing, ISBN 0-932633-19-6
- [Garvin] D.A. Garvin (1984), What does product quality really mean?, in: Sloan Management Review, Vol. 26, nr. 1 1984
- [Gerrard] P. Gerrard and N. Thompson (2002), Risk-Based E-Business Testing, Artech House Publishers, ISBN 1-58053-314-0
- [Gilb and Graham] T. Gilb and D. Graham (1993), Software Inspection, Addison-Wesley, ISBN 0-201-63181-4
- [Graham] D. Graham, E. van Veenendaal, I. Evans and R. Black (2007), Foundations of Software Testing, Thomson Learning, ISBN 978-1-84480-355-2
- [Grochtmann] M. Grochtmann (1994), Test Case Design Using Classification Trees, in: Conference Proceedings STAR 1994
- [Hetzel] W. Hetzel (1988), The complete guide to software testing – 2nd edition, QED Information Sciences, ISBN 0-89435-242-3
- [Juran] J.M. Juran (1979), Quality Control Handbook, McGraw-Hill
- [Kirakowski93] J. Kirakowski, M Corbett (1993), SUMI: the Software Usability Measurement Inventory, British Journal of Educational Technology, Volume 24, Issue 3, pages 210–212, September 1993
- [McCabe] T. McCabe (1976), A complexity measure, in: IEEE Transactions on Software Engineering, Vol. 2, pp. 308-320
- [Musa] J. Musa (1998), Software Reliability Engineering Testing, McGraw-Hill Education, ISBN 0-07913-271-5
- [PMBOK]
- [TMap] M. Pol, R. Teunissen, E. van Veenendaal (2002), Software Testing, A guide to the TMap Approach, Addison Wesley, ISBN 0-201-745712
- [TMMi] E. van Veenendaal and J. Cannegieter (2011), The Little TMMi, UTN Publishing, ISBN 97-89490986-03-2
- [Veenendaal08] E. van Veenendaal (2008), Test Improvement Manifesto, in: Testing Experience, Issue 04/08, December 2008

Internet

- [extremeprogramming.org] <http://www.extremeprogramming.org/>; retrieved on the 04th of June, 2018.

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Appendix B

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