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Systems and software engineering — Requirements for testers and reviewers of information for users

Ingénierie des systèmes et du logiciel — Exigences pour testeurs et vérificateurs de documentation utilisateur

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Foreword

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The main task of ISO/IEC JTC 1 is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Software & Systems Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This second edition of ISO/IEC/IEEE 26513 cancels and replaces ISO/IEC 26513:2009 which has been technically revised. The main changes compared to the previous edition are as follows:

— additions to the Terms and Definitions;

— updates to the Documentation Review and System Test of Documentation sections;

— expanded sections for Accessibility Testing and Translation and Localization Review and Testing;

— replacement of the editorial checklists in Annex A with User-centered Test and Review Guidelines;

— editorial changes; and

— additions to the bibliography.

Introduction

Well-designed documentation not only assists users and helps to reduce the cost of training and support, but also enhances the reputation of the product, its producer, and its suppliers. Verification, validation testing, and expert review of content during development provides feedback to information developers regarding the accuracy and usability of their work. This document addresses the evaluation and testing of information provided for users to perform tasks, make decisions in context, and gain understanding. It applies to both initial development and subsequent releases of the software and user documentation.

This document is independent of the software tools that may be used to produce documentation and applies to printed and electronic documentation, embedded content in the software, and online documentation. Much of its guidance is applicable to user documentation for systems including software user documentation as well as the software used to control machinery or hardware devices.

This document was developed to assist those who test and review software user documentation as part of the software lifecycle process. This document defines the information management and validation processes of ISO/IEC/IEEE 12207:2017 from the information assessors' and testers' standpoints. This document can be used as a conformance or a guidance document for products, projects, and organizations claiming conformance to ISO/IEC/IEEE 15288:2015 or ISO/IEC/IEEE 12207:2017. Readers are assumed to have experience with or general knowledge of reviewing and testing processes.

Systems and software engineering — Requirements for testers and reviewers of information for users

1 Scope

This document supports the interest of software users in receiving consistent, complete, accurate, and usable documentation and specifies processes for use in testing and reviewing of user documentation (Clause 6). It is not limited to the test and review stage of the lifecycle, but includes activities throughout the information management and documentation management process.

This document is intended for use in all types of organizations, whether or not a dedicated documentation department is present. In all cases, it can be used as a basis for local standards and procedures. Readers are assumed to have experience or general knowledge of testing or reviewing processes.

This document deals with the evaluation of end-user content only, and not with the evaluation of the software it supports.

NOTE 1 Documentation is also included in evaluation of the software product, as in the ISO/IEC 25000 and 29000 series of standards. In particular:

— ISO/IEC TR 25060;

— ISO/IEC 25062;

— ISO/IEC 25063:2014;

— ISO/IEC 25064:2013; and

— ISO/IEC/IEEE 29119-3:2013.

This document provides the minimum requirements for testing and reviewing user documentation (Clause 7), including both printed and online documents used in work and other environments by the users of software which includes application software, systems software, apps on mobile devices, and software that controls machinery or hardware devices. It applies to printed user manuals, online help, user assistance, tutorials, websites, and user reference documentation.

This document can also be helpful for testing and reviewing the following types of documentation:

— documentation of products other than software, for example, hardware or devices;

— multimedia systems using animation, video, and sound;

— tutorial packages and specialized course materials intended primarily for use in formal training programs;

— documentation produced for installers, computer operators, or system administrators who are not end users; and

— maintenance documentation describing the internal operation of systems software.

This document is applicable to testers, reviewers, and other related roles, including a variety of specialists:

— usability testers, documentation reviewers, and subject-matter experts;

— information developers and architects who plan the structure and format of products in a documentation set;

— usability analysts and business analysts who identify the tasks the intended users perform with the software;

— editors;

— test participants;

— installers, computer operators, or system administrators; and

— customer support groups such as training, help desks, repair, and return.

The document can also be consulted by those with other roles and interests in the information management process. Managers of the software development process or the information management process consider the testing of documentation as part of their planning and management activities. Project managers, in particular, have an important role in supporting the review and testing of documentation.

Testing of the documentation is likely to highlight any defects or nonconformances in tools that are used to create or display online documentation. Similarly, usability testing of the documentation is likely to identify additional operational concerns or misunderstandings of end users.

NOTE 2 Testing of documentation can highlight problems with the software being documented. Resolving problems with the software is not in the scope of this document.

There are other roles that need to understand the test processes for the documentation; for example, information developers should understand the test processes for the documentation that they have produced, and acquirers of documentation prepared by another department or organization might want to know what testing has been performed and the processes followed for the documentation that they are acquiring from a supplier.

The order of clauses in this document does not imply that software user documentation is meant to be reviewed, assessed, edited, or tested in this order.

In each clause, the requirements are media-independent, as far as possible. The informative guidelines found in *Annex A, User-Centered Test and Review Guidelines*, can be used at each stage of the information management process to verify that the correct steps have been carried out and that the finished product has acceptable quality.

The works listed in the Bibliography provide additional guidance on the processes of managing, preparing, and testing of user documentation.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO, IEC and IEEE maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEEE Standards Dictionary Online: available at http://dictionary.ieee.org

NOTE ISO/IEC/IEEE 24765 Software and Systems Engineering Vocabulary can be referenced for terms not defined in this clause. This source is available at the following web site: *http://www.computer.org/sevocab*.

3.1
A/B testing
technique to determine the effectiveness of minor changes in a product or design where “A” represents the original version and “B” represents the modified version

Note 1 to entry: This notation is typically used in usability testing. In this instance, A/B does not refer to alpha and beta testing.

3.2
accessibility
consideration of a product, service, environment, or facility by people with the widest range of capabilities

Note 1 to entry: Although "accessibility" typically addresses users who have disabilities, the concept is not limited to disability issues.

3.3
assistive technology
hardware or software that is added to or incorporated within a system that increases accessibility for an individual

EXAMPLE Braille displays, screen readers, screen magnification software, and eye tracking devices are assistive technologies.

[SOURCE: ISO/IEC/IEEE 24765:2010]

3.4
audience
category of users sharing the same or similar characteristics and needs (for example, purpose in using the documentation, tasks, education level, abilities, training, experience) that determine the content, structure, and use of the intended documentation

Note 1 to entry: See also **persona (3.29)**.

Note 2 to entry: There may be a number of audiences for a software product’s documentation (for example, management, data entry, maintenance, engineering, business professionals).

3.5
caution
hazardous situation which, if not avoided, can result in minor or moderate injury

Note 1 to entry: See also **danger (3.8)** and **warning (3.50)**.

[SOURCE: ISO/DIS 3864-2:2015, definition 3.1, Modified, ""signal word" removed from definition.]

3.6
complete
<documentation> all critical information and any necessary, relevant information for the intended audience

[SOURCE: ISO/IEC/IEEE 15289:2017]

3.7
critical information
information on the safe use of the software, the security of the information created with the software, or the privacy of the information created by or stored with the software

3.8
danger
hazardous situation, which if not avoided, can result in death or serious injury

Note 1 to entry: See also **caution (3.5)** and **warning (3.50)**.

[SOURCE: ISO/DIS 3864-2:2015, definition 3.3, Modified, "signal word used to indicate" removed from definition.]

3.9
document (noun)
uniquely identified unit of information for human use

EXAMPLE Report, specification, manual, or book in printed or electronic form.

Note 1 to entry: A document can be a single information item or part of a larger information item.

[SOURCE: ISO/IEC/IEEE 15289:2017]

3.10
documentation
information that explains how to use software, devices, applications, or services

Note 1 to entry: Throughout this document, the term documentation refers to software user documentation. "Software" includes application software, systems software, and software that controls machinery or hardware devices. Documentation may include a wide variety of products such as user guides, reference manuals, tutorials, wikis, input forms, error messages, user interfaces, and online help.

3.11
document set
collection of documentation that has been segmented into separately identified volumes or products for ease of distribution or use

3.12
effectiveness
accuracy and completeness with which users achieve specified goals

[SOURCE: ISO/IEC 25062:2006, definition 4.2]

3.13
efficiency
resources expended in relation to the accuracy and completeness with which users achieve goals

Note 1 to entry: Efficiency in the context of usability is related to productivity rather than to its meaning in the context of software efficiency.

[SOURCE: ISO/IEC 25062:2006, definition 4.3]

3.14
embedded documentation
information that is delivered as an integral part of a piece of software

EXAMPLE Tool tips or other text displayed or provided with the software.

3.15
evaluation
systematic determination of the extent to which an entity meets its specified criteria

3.16
function
part of a software application that provides features for users to carry out their tasks

3.17
hazard
source of potential harm

[SOURCE: ISO/DIS 3864-2:2015, definition 3.6, Modified, Note 1 to entry removed.]

3.18
heuristic evaluation
assessment by one or more experts who judge conformance to a recognized set of principles

3.19
illustration
graphical element set apart from the main body of text and normally cited within the main text

Note 1 to entry: In this document, the term *illustration* is used as the generic term for tables, figures, exhibits, screen captures, flow charts, diagrams, drawings, icons, and other graphical elements.

3.20
information architect
person who develops the structure of an information space and the semantics for accessing required task objects, system objects, and other information

3.21
information development
process of development concerned with determining what content and visuals shall be provided in product documentation and what the nature of the information shall be

3.22
information developer

person who prepares the content and visuals for product documentation

3.23
information development lead
person who leads the activities of preparing documentation

3.24
link
reference from some part of one document to some other part of another document or another part of the same document

Note 1 to entry: Synonym: hyperlink

3.25
localization
creation of a national or specific regional version of a product or its documentation

Note 1 to entry: Documentation can be localized even if the product has not been localized.

3.26
mobile device
portable computing device, typically having a wireless internet connection and a display screen with touch, pen, or keyboard input, and possibly auditory input and output features

Note 1 to entry: Mobile devices have to fulfil special usability requirements due to their size and available features for input and output.

3.27
navigation
process of accessing information and moving between different items of information

3.28
online help
information about the software that is intended to be read on the screen by the user while using the software

Note 1 to entry: Online help can be displayed in a variety of forms (contextual help, screen tips, and examples).

3.29
persona
model of a user with defined characteristics, based on research

3.30
platform
combination of an operating system and hardware that makes up the operating environment in which a program runs

3.31
procedure
ordered series of steps that a user follows to perform one or more tasks

3.32
project manager
person with overall responsibility for the management and running of a project

3.33
satisfaction
freedom from discomfort and positive attitudes towards the use of the product

[SOURCE: ISO/IEC 25062:2006, definition 4.4]

3.34
software
part of a product that is the computer program or the set of computer programs

Note 1 to entry: For the purposes of this document, the term software does not include information developed for users.

3.35
software user documentation
electronic or printed body of material that provides information and assistance to users of software

3.36
step
element of a procedure containing one or more actions that enables a user to perform a task

3.37
style
set of language-specific editorial conventions covering grammar, terminology, punctuation, capitalization, usage, word choice, structured authoring elements, and images in documentation

3.38
tailoring
process by which individual requirements in specifications, standards, and related documents are evaluated and made applicable to a specific project by selection, and in some exceptional cases, modification of existing or addition of new requirements

[SOURCE: ISO 27025:2010, definition 3.1.3]

3.39
test lead
person who leads entire testing process

3.40
test participant
person who provides feedback and allows data collection to test that the information in the software documentation is sufficient to accomplish tasks correctly and form a conceptual understanding of the system

3.41
test protocol
list of the steps to be followed in the test

3.42
testing
activity in which a system or component is executed under specified conditions, the results are observed or recorded, and an evaluation is made of some aspect of the system or component

3.43
topic
unit of information that deals with a single subject

3.44
usability
extent to which a system, product, or service can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use

[SOURCE: ISO 9241-210:2010, Modified, Note 1 to entry removed.]

3.45
usability analyst
person who observes users performing tasks using the software and documentation and records the actions the user took, problems the user encountered, and comments the user made during the test; and interprets these records to evaluate the results of the testing

3.46
use case
description of the behavioral requirements of a system and its interaction with a user

3.47
user
person who employs software to learn or to perform a task

3.48
validation
confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled

Note 1 to entry: A system is able to accomplish its intended use, goals, and objectives (i.e., meet stakeholder requirements) in the intended operational environment.

[SOURCE: ISO 9000:2015, Modified, Note 1 to entry has been modified, Notes 2 and 3 to entry have been removed.]

3.49
verification
confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

Note 1 to entry: Verification is a set of activities that compares a system or system element against the required characteristics. This includes, but is not limited to, specified requirements, design description, and the system itself.

[SOURCE: ISO 9000:2015, Modified, Note 1 to entry has been modified, Notes 2 and 3 to entry have been removed.]

3.50
warning
hazardous situation, which if not avoided, can result in death or serious injury

Note 1 to entry: See also **caution (3.5)** and **danger (3.8)**.

[SOURCE: ISO/DIS 3864-2:2015, definition 3.18, Modified, "signal word" removed from definition.]

4 Conformance

4.1 Definition of conformance

This document may be used as a conformance or a guidance document for projects and organizations claiming conformance to:

— ISO/IEC 26514:2008, *Systems and software engineering — Requirements for designers and developers of user documentation*;

— ISO/IEC/IEEE 15288:2015, *Systems and software engineering — System lifecycle processes*;

— ISO/IEC/IEEE 12207:2017, *Systems and software engineering — Software lifecycle processes*.

When the selected software lifecycle processes are tailored, the organization or project may claim conformance to this document for its information testing process.

Throughout this document, "shall" is used to express a provision that is binding, "should" to express a recommendation among other possibilities, and "may" to indicate a course of action permissible within the limits of this document. When using this document as a guide, replace the term "shall" with "should".

NOTE ISO/IEC/IEEE 12207:2017 Annex A defines the tailoring process.

4.2 Conformance situations

Conformance may be interpreted differently for various situations. The relevant situation shall be identified in the claim of conformance:

— When conformance is claimed for a project, the project plans or the contract shall document the tailoring of the assessment and test (validation) process;

— When conformance is claimed for a multi-supplier program, it may be the case that no individual project may claim conformance because no single contract calls for all the required activities. Nevertheless, the program, as a whole, may claim conformance if each of the required activities is produced by an identified party. The program plans shall document the tailoring of the required tasks and their assignment to the various parties, as well as the interpretation of any clauses of the document that reference "the contract."

— This document may be included or referenced in contracts or similar agreements when the parties (called the acquirer and the producer or supplier) agree that the supplier shall deliver user documentation testing or reviewing and editing services in accordance with the document. This document may also be adopted as an in-house standard by a project or organization that decides to test or assess documentation in accordance with the document.

5 Review and assessment processes of user documentation within the software lifecycle

5.1 Process overview

This clause covers the processes involved in testing and reviewing user documentation.

Testers and reviewers of software user documentation work within the lifecycle processes of the software product, which are defined in ISO/IEC/IEEE 12207:2017. The applicable processes are the following:

— implementation;

— validation;

— verification; and

— maintenance.

5.2 Review and assessment activities

The typical lifecycle of documentation and its testing and review includes the following activities:

— user needs assessment;

— task analysis;

— user documentation requirements definition;

— document (information) design;

— draft or prototype;

— revision;

— early testing (prototype, information architecture, issue identification);

— beta review (accuracy, editing);

— evaluative testing (efficiency, effectiveness, satisfaction, accessibility);

— final release; and

— evaluative testing, optional (performance, learnability, A/B testing).

In addition to leading the activities of preparing documentation, the information development lead identifies reviewers during the design and development stages. Review activities include review of structure, format, and technical content against established guidelines and documentation standards. Within the Software Validation process described in ISO/IEC/IEEE 12207:2017, the relevant functions are performed so that representative users can successfully complete their intended tasks and the product satisfies its intended use.

Testing and reviewing user information, which includes the user interface, the navigation, and the information architecture, should be part of the same processes as the product lifecycle and should be performed in conjunction with the development of the software so that the software and the user documentation are tested, distributed, and maintained together. The testing of all the documentation should be a part of the development of the product as a whole and not a separate exercise. Although accurate user documentation cannot be completed until the software product has been fully developed, the user documentation and the product both benefit from concurrent development and testing.

The validation and verification processes apply to software and documentation developed under both the classic documentation development process (development of a new product with a new user manual), and also more complex circumstances, such as previous documentation that should be:

— converted to a different format or different media, such as mobile device interfaces;

— converted into different information products such as tutorials, online help, or advanced reference guides;

— adapted or used as models for different products acquired or supplied by an organization;

— modified to adhere to new regulations, business process guidelines, or compliance requirements;

— converted into different languages or variants including localization and tailoring.

In addition, the test process should also be applied in the following circumstances:

— a previously documented software product is being upgraded, offered in a new version or on different operating system platforms, or tailored as part of system integration requiring the revision of previous documentation;

— documentation developed along with software product development methods such as Agile or eXtreme that require multiple iterations before release;

— software or documentation delivered on multiple platforms with tailoring for these environments; and

— documentation migrated from unstructured content to structured content.

Testing and reviewing software user documentation is greatly assisted by the presence of other documentation produced during the software lifecycle, such as a documentation plan, prototypes, system design document, system test plan, release records, and usability reports. Other documentation specific to the information management process may be produced, such as style guides and business processes for content management and documentation reviews, and accessibility standards.

NOTE 1 ISO/IEC/IEEE 15289:2017 provides recommendations for the required documents throughout the systems and software lifecycle.

NOTE 2 This document is also related to the following standards: ISO/IEC 25000:2015 and ISO/IEC 14598, Parts 1-6, 1998-2001. These documents describe the quality metrics characteristics of software and the evaluation process for providing quality in a software product. The same processes can be used to help the documentation meet the required quality through the use of evaluation metrics (such as effectiveness and satisfaction, learnability, errors, and safety).

NOTE 3 Of particular relevance is ISO/IEC 25066:2015, as usability performance targets are often closely associated with information design and content.

For the sake of simplicity, this document describes the lifecycle as if there were a clear starting point for developing documentation and a clear end point. However, there is no sequence of activities that can be followed in all cases for all products and all types of information. For example, implementation and review activities are very closely related, as are testing and maintenance, and the way they relate together varies among projects.

6 Documentation evaluation strategy

6.1 Requirements, objectives, and constraints

The purpose of documentation evaluation is to help ensure that documentation assists end users achieve their goals. This clause describes the processes of documentation evaluation in two forms: reviewing and testing. Documentation evaluations are performed throughout the document's development, production, and maintenance lifecycle.

Documentation evaluation shall be based on documentation quality. Quality is the ability of documentation to meet user needs, expectations, and requirements. Managers, developers, testers, and maintainers should evaluate the quality of the documentation. Managers shall be responsible for assuring that the quality of user documentation has been evaluated. Evaluations can be performed by developers, testers, maintainers, managers, and other roles. Ultimately, the users should be satisfied with the documentation quality; however, managers, developers, testers, and maintainers shall accept the quality before the documentation is released to the users. The evaluation of documentation quality depends on the recognition of various perspectives for acceptability:

— **Managers.** Managers are more concerned with overall quality than with specific quality characteristics. They can assign different weights to certain characteristics to reflect the business needs of the organization, comparing the documentation to what is commercially available in the market and what is less costly to produce. Managers should be aware that the quality of documentation can appreciably affect costs for customer support and future sales.

— **Software developers.** Developers are concerned with the conformance of documentation to the software functionality.

— **Product testers.** Testers are concerned with how the product operates in its innovative or advanced functions in the same way as other developers, but should have a better understanding of how the product supports the users' tasks, and whether the documentation matches the product and helps the users to accomplish tasks. For online information, interface design, and navigation, product test can provide valuable assessment of content accuracy. Product testers can stress-test to assess performance under extreme or sensitive conditions.

— **Product support staff.** Staff who maintain the software and systems after the product release have special requirements for quality in addition to those of other developers. Product support staff can be concerned with the accuracy, the availability, and the searchability of different versions of the documentation.

— **Content managers.** Content managers are concerned with how documentation can be controlled for subsequent document releases, different versions, information reuse, metadata associated with content for search and retrieval, and translation and localization.

— **Editors.** Editors are concerned with documentation conformance to organizational style, formats, language, terminology, and structure.

— **Usability analysts.** Analysts record the actions of the test participants, the problems the participants encountered, and comments made during and after the test activity. They also interpret records of usability test data (such as user actions, problems, and comments, time-on-task, and successful task completion) to evaluate the results of the testing. Usability analysts can be concerned with whether the documentation meets the end users' needs with satisfaction. Early in the development cycle, usability analysts identify design issues and errors; later, the focus can shift to performance, satisfaction, and learnability measures

— **Users.** Users are likely to assess quality in terms of ease of use and product satisfaction. When involved in usability testing, users who function as test participants provide both qualitative and quantitative feedback.

6.2 Documentation evaluation activities

Documentation evaluation shall include review as well as testing and shall consist of the following four activities: Plan, Do, Check, Act. Figure 1 shows the iterative cycle of evaluation to support documentation quality.

Figure 1 — Iterative cycle of documentation evaluation

— **Plan.** The Information development organization shall identify the requirements for acceptable performance or quality. The organization shall prepare for the evaluation exercise by specifying the schedule, the resources needed, how the evaluation is carried out (test scenarios and scripts), how the results are measured and recorded, how the results are analyzed, and the acceptance criteria for the evaluation lifecycle;

— **Do.** The information development organization shall draw up test protocols based on the requirements of the planning stage. The organization shall then evaluate the documentation against the requirements, and record the results. Tests may be carried out by members of the project team during development by following the test scripts so that tests are systematic and complete. Usability tests require the recruitment of test participants who are representative of the target audience;

— **Check.** The information development organization shall analyze and report the results of the evaluation, recommending next steps. See: ISO/IEC 25062:2006; and

— **Act.** Based on the evaluation results and recommendations, the information development organization shall revise the documentation, and determine if further evaluation cycles are needed.

Revisions can entail changes in the project schedule and documentation plan or even changes in the requirements to produce acceptable results. For example, documentation of advanced functions can be deferred until a later project stage, or product release dates can be deferred until acceptable documentation is produced. Data from review and evaluation activities should be handled in accordance with organizational policies, data handling requirements, and ethical considerations.

The documentation evaluation activities recommended in this document should be carried out under the control of the quality management system for the software product. Users of this document are advised to adhere to a quality management system, which may be independently assessed for ISO 9001:2015 compliance.

6.3 Selection of an evaluation method

The evaluation methods selected depend on a variety of factors including:

— the reasons for carrying out the evaluation;

— the stage in the lifecycle at which the evaluation is being carried out;

— the time and physical resources available;

— the amount of information available about the product or service;

— the availability of test participants with the correct ranges of experience and skill; and

— the availability of experts in information development.

Different methods may be used at different stages in the development, after the documentation is complete, and when the documentation has been used for a specified period. A combination of methods is likely to be needed in each case.

6.4 Documentation evaluation criteria

Planning for documentation evaluation shall establish criteria such as the following:

— accuracy of content;

— topic coverage;

— safety (provision of critical information to protect against hazards or defects);

— legal, statutory, and regulatory requirements for those regions where the product is offered;

— documentation's structure, format, and style compared to plans, requirements, and established standards;

— suitability for translation and localization; and

— overall readiness of the documentation for release.

In addition, the review process should include data from usability testing and accessibility testing. A more detailed description of these criteria is in 7.2 and 7.3.

6.5 Documentation test process

Documentation test requirements shall be specific and measurable. Documentation testing identifies issues with the information, interface, product, or service early in the development process so that changes can be rapidly incorporated. The purpose of the test process is to provide formal evidence that the user documentation:

— enables users to accomplish their goals;

— meets the requirements and constraints, such as the documentation policy and standard formats and styles set by the producer of the software product;

— is technically accurate (consistent with the product);

— is sufficient and meets the usability targets identified; and

NOTE ISO/IEC 26514:2008, 11.1, provides additional information on the completeness of documentation.

— meets the needs of the intended purchaser, owner, or end user of the software product and documentation.

6.6 Project requirements affecting documentation evaluation

The user documentation tester or reviewer shall gather or receive information about the testing of the whole project to understand the requirements that affect the testing of the documentation components. Documentation testers and reviewers need the following information in order to plan the evaluation of the documentation:

- Who are the users and in what contexts do they use the product and the documentation?
- Is there a pool of test participants available or do recruitment strategies need to be developed?
- Have personas been established and used in the development of the product and the documentation?
- Have accessibility testing requirements been identified?
- What is the purpose of the software product?
- Is there a previous version of the product or the documentation? If so, which features have changed and which have remained the same?
- What types of documentation and in what formats and media are the documentation produced for the end users?
- What is the scope of the evaluation; that is, how much documentation needs to be tested?
- On which platforms or software environments do the product run at this release? Are there plans for other platforms or software environments later?
- Are localized or tailored versions of the product required?
- Does the documentation need to be translated into foreign languages? If so, which languages?

Documentation testers need to know the following about the product development schedule:

- Does the software development use a predictive or adaptive lifecycle model (waterfall or agile) approach?
- What product tests are planned and what is the schedule?
- What is the delivery date for the finished product?
- What are the major dependencies between different activities in the overall project?

6.7 Resource requirements and planning

6.7.1 General

The test lead should obtain information on the planned or required tools for:

- reviewing the documentation; and
- testing the documentation and user interface, including usability test protocols and tests for accessibility.

NOTE If the new product is part of a suite of products, consider the use of any tools already specified for testing documentation for that suite.

In planning the evaluation of the documentation, the availability of resources should be considered. The evaluation plan should include the time and effort to acquire resources or services that are not already available in the organization. Recruitment of test participants for usability testing can be done within the organization or by an outside agency. Sampling methods should result in participants reflecting the target population.

6.7.2 Resources for documentation evaluation

Resources for evaluating the documentation include facilities, services, tools, and human resources, such as:

- required variety of hardware and software (especially mobile devices in different environments) for testing prototypes or other versions of the documentation and software;
- tools for authoring and managing test cases;
- testing tools (recording, data handling, analysis applications);
- provision for the use of a working model or prototype of the documentation or the user interface;
- laboratory or space for usability testing;
- resources to enable remote testing;
- translators and knowledgeable staff where translation or localization is a requirement;
- subject matter experts who review the documentation for technical accuracy;
- editors who editorially review drafts of the documentation;
- test staff with different roles (reviewer, observer, moderator, information developer);
- test participants;
- usability testers;
- data analysts;
- secure networks and storage space; and
- adequate budget for participant compensation.

NOTE The individual who developed the content can also be the same individual who performs the test protocol.

6.7.3 Impact of evaluation on project schedules

During the project implementation stage, the organization shall prepare a preliminary schedule for documentation activities including evaluation and test. Documentation designers, developers, testers, and the project manager shall agree on the overall schedules for the project.

NOTE Agile development can occur in sprints which makes it crucial for the information developer to stay abreast of the interface development, as well as aligning to the test cycles as content becomes available and testing is done as part of a sprint. Additional information on Agile can be found in ISO/IEC/IEEE 26515:2012.

Changes in the software product and in planned delivery dates resulting from defects discovered during documentation reviews and tests shall be promptly communicated to all concerned. The impact of these changes on the review or test schedule and project schedule shall be evaluated. If schedules need to be adjusted during the project, activities such as document tests, reviews, and usability tests should not be removed from the schedule to save time at the expense of quality.

The documentation plan details the assumptions and dependencies on which the test schedule is based. Examples of test schedule dependencies include: the availability of the product content documentation, availability of test personnel, time required for training personnel, and the status of testing in earlier stages of the development cycle. For first time documentation testing, time should be allocated for learning how to use the required documentation test tools and assistive technologies.

Consideration also needs to be given in the schedule to the timing and requirements for translation if translated or localized versions of the documentation are required.

Ideally, the test, development, and documentation development milestones should coincide. However, it is acceptable to overlap the schedules for different milestones and, if the schedules allow for it, other test organizations may begin reviewing the documentation prior to the start of a formal documentation test cycle. However, this early review may result in increased risk that can impact the quality of the deliverables and should be assessed by the project team.

7 Documentation evaluation methods and procedures

7.1 General

This clause provides examples of the different methods of documentation evaluation and the procedures and activities relating to them. In most cases, a range of evaluation methods are used. In the subclauses below, the following document evaluation methods are explained:

— documentation review (7.2);

— system test of documentation (7.3);

— usability testing of documentation (7.4);

— accessibility testing of documentation (7.5); and

— translation and localization review and testing (7.6).

Documentation review can be considered as evaluation by inspection. Inspection-based evaluation is a generic term for methods that include heuristic evaluation, cognitive walkthroughs, standards inspection, pluralistic walkthroughs, and consistency inspections (see 7.2.3). Some reviews are more accurately performed automatically, such as system checks for consistent spelling and terminology.

User-centered review and test guidelines are provided in Annex A.

7.2 Documentation review

7.2.1 Planning documentation review

Documentation review should both precede and follow documentation testing to improve documentation quality, thereby reducing the number of flaws and defects remaining to be identified in testing, and thus the amount of rework and retest at a later stage.

After documentation is released, evaluation continues in the form of feedback from users and evaluative usability tests. Surveys and interviews may also be useful in gathering user and customer satisfaction on released documentation. Problem reports gathered by trainers, sales staff, and customer support can also indicate where the documentation or product needs improvement.

7.2.1.1 General

The information development lead and the project manager should determine the review participants, processes, and procedures. Reviewers may be peers, editors, subject matter experts, developers, testers, product managers, trainers, or customers. Reviewers should be selected based on their expertise, familiarity with the requirements and standards, and ability to provide thorough and usable comments and corrections.

The order in which review activities are conducted should also be considered. For example, it is inefficient to hold detailed editorial reviews before the technical content is accurate and consistent.

Annex A of this document provides user-centered guidelines that can be used to help plan the test and review of the documentation. The guidelines included in this annex are informational only and provide examples of guidelines used by some organizations. Different types of documentation, such as printed and online information, may use different guidelines.

7.2.1.2 Objective for documentation review

The objective of documentation review is to verify that the documentation conforms to agreed plans, requirements, and established standards, and that the information is technically accurate and complete.

7.2.1.3 Requirements for documentation review

The full review process should begin after the design of the documentation is finished and the draft content is substantially complete.

In an Agile environment, assessment should occur at the end of each sprint.

7.2.1.4 Plan for evaluating documentation

A plan should be produced for documentation review by the information development lead. The plan should include the following information:

— schedules, tools, and the resources required for review;

— identification of any training needs for participants about the review process;

— reviewers and their focus for the review, for example, technical accuracy before style; and

— review methods to use (synchronous where reviewers simultaneously review the same content or sequential where a reviewer passes on a review to the next reviewer to avoid duplicate comments on the same material).

Where the volume of the information is significant, a sampling technique may be used to select a representative sample of documentation for review. However, a risk analysis should be conducted beforehand to ascertain risks to the users if sections that are not reviewed contain inaccuracies or safety issues.

In addition, the plan should include:

— methods to provide, store, and share review comments; and

— methods to resolve review comments.

In reviewing topics used in multiple versions (reusable content), check that a change in one version does not adversely affect other uses of the topic. Have a policy that indicates whether previously approved topics need to be reviewed again in context as specified in ISO/IEC/IEEE 26531:2015.

When reviewing online documentation with working software, information developers should include with all drafts distributed to reviewers:

— clear review criteria;

— instructions for how to provide comments and for using review tools; and

— instructions concerning the return of comments to a specified person by a specified date.

Consider assisting reviewers by highlighting changes made from previous drafts, for example, by vertical lines in the margin, to avoid the need to reread unchanged text. This technique is useful if reviewers only read the highlighted sections.

Determine if reviewers are permitted to keep a copy of the draft, based on security or configuration control restrictions.

7.2.2 Administering quality review

Reviewers shall review documentation drafts for the following:

— **Technical accuracy.** The information developer identified in the documentation plan is responsible for the technical accuracy of all the documentation for the product and for resolving any conflicting comments from subject matter experts;

NOTE 1 Technical accuracy of instructional procedures is better verified by testing the documentation with the software than by reviews. Technical reviews of embedded documentation (such as pop-up help) are best performed in conjunction with software product testing.

— **Safety and security.** An expert shall review the documentation to check that it contains hazard statements and recovery instructions for risks associated with use of the product. The reviewers shall verify that hazard statements are correctly labelled and worded. Hazard statements may be labelled as Caution, Warning, or Danger.

— **Conformance and consistency.** Information developers or editors should verify that the documents conform to all the requirements of selected standards and organizational policies and style guides, follow the documentation and design plans, and are consistent with each other in appearance and terminology. See Annex A, User-centered review and test guidelines, to check for consistency and accuracy in references or links to other parts of the document or document set;

— **Completeness.** A documentation section or topic should include or refer to all the information that users need. Review the total set of documentation, printed and online, including the items that are integrated with the software;

— **Editorial consistency and correctness.** An editor should check near-final drafts for spelling, grammar, punctuation, editorial standards, and styles;

— **Legal accuracy.** Check that near-final drafts have the correct legal notices and that trademarks have been handled correctly;

— **Accuracy of links, cross-references, and page references.** Verify that all links and page references point to the correct location in the documentation and that screen interactions and navigation paths are suitable for all target devices (desktop, notebook, or mobile);

— **Tables and images**. Verify that the size of the documentation (both text and graphics) adapts to all target screen sizes. Verify that all images or icons display properly and are correctly mapped to the application they represent. Verify that all images have appropriate metadata (ALT tags) for assistive technology tools (see 7.3);

— **Storage and sharing of review feedback.** Processes need to be in place for shared access to reviewer feedback; and

— **Translation and localization.** A SME with language fluency should verify that translations and localizations are correct, complete, and compliant with the legal requirements of the local jurisdiction.

This activity should ideally be conducted near the final drafts.

Topics, sections, and partial documents may be reviewed. For a long document, the author may send a new topic to a subject matter expert for review before the whole document is finished. For document

revisions, only topics with new or revised content may be reviewed. Depending on organization policy, documentation may be reviewed in its entirety before production or release of the documentation to users or acquirers.

NOTE 2 In Agile development, a full release review can require an examination of previous iteration cycle documentation.

7.2.3 Managing the results of documentation review

Reviewers may offer divergent opinions and comments. The organization should determine who on the project team may see and assess other reviewers' suggestions. Review and acceptance procedures shall specify who is the final authority for accepting and implementing changes. The default authority is the information developer.

Reviewers' comments shall be retained at least until the next cycle of reviews has been completed. Reviewers should be able to access their previous comments while reviewing subsequent drafts.

7.2.4 Configuration change review

Revised drafts should be reviewed for editorial accuracy (making sure that the comments made on the previous draft have been incorporated correctly and have not introduced inconsistencies) and for technical accuracy, particularly if the software design has changed since the previous documentation draft. The information developer should check with those responsible for product configuration management to identify any changes to the software application as a result of software reviews and tests, which should be reflected in the documentation. All review comments need to be assessed and incorporated if applicable.

7.3 System test of documentation

7.3.1 General

The system test of documentation validates and verifies documentation in conjunction with the system that it supports. System test of documentation involves using the documentation in conjunction with the software to determine whether the documentation is consistent with the software or system. The system test of documentation determines whether the documentation is technically accurate (verify), but does not determine whether the documentation is usable (validate). However, system testing of documentation can highlight usability issues.

System test of documentation may be considered to be part of the technical processes in the lifecycle and is a part of the verification process or system qualification testing. These lifecycle processes are defined in ISO/IEC/IEEE 12207:2017, and ISO/IEC/IEEE 15288:2015.

Verification or system test of documentation is a process for determining whether the software products and documentation fulfill the design and other requirements or conditions imposed on them. This process may include analysis, review, and test. For documentation, verification or system test includes testing that the specified design requirements are met by the software and documentation. The process provides the information required to correct nonconformances in the documentation.

If the documentation is integrated with documentation from other products, then integration testing should be used for testing documentation as part of a given scenario or solution. Use cases or scenarios may be used to validate against the documentation, ensuring that it is correct when integrated with the documentation from other products.

System test of information applies to information for the following system elements:

— devices such as desktop computers, notebook computers, and mobile devices;

— user interfaces such as embedded information;

— visualizations such as videos, 3D animations, illustrations, and tutorials; and

— documents such as user manuals.

System test of documentation includes the following activities:

— planning the tests;

— designing the tests;

— performing the tests; and

— assessing and reporting the test results.

The information development team should perform testing at every stage in documentation development when the software is available.

System test of documentation should include both embedded and separate documentation and should verify that:

— the access methods and navigation features for embedded documentation and guided instructions perform properly;

— the links and cross-references for related information work correctly on all platforms;

— the correct information (such as an error message) is displayed in each given situation;

— the instructions in the documentation have the desired effect when carried out;

— all the examples, including illustrations and screen captures in the documentation and tutorials, have been thoroughly verified for consistency with the software function; and

— the documentation headings and metadata quickly lead users to the needed information for performing their tasks.

NOTE In some instances, system test is an independent group from the information development team.

7.3.2 Planning system test of documentation

A determination should be made by the project team whether the project requires a system test of the documentation and the degree of organizational independence of any needed effort. The categorization of errors or deficiencies should be identified in advance of a system test. Severity levels should be established before testing. Certain deficiencies can be associated with particular issue severity levels (e.g., high, medium, low).

If the project requires a system test of documentation, a test plan shall be established by the tester, or test lead, to verify the documentation with the software product.

Documentation products requiring verification shall be established, and the associated verification activities including associated methods, techniques, and tools for performing the tasks, shall be selected by the project team or tester. The strategy for verifying the documentation throughout the lifecycle shall be established.

This strategy applies to the system and to its descriptions; for example, requirements, designs, and definitions. It includes the context and purpose for each instance of a verification action; for example, verifying the design, ability to build the design correctly, ability to reproduce the system, ability to correct a fault, and ability to predict failures. Use cases should be developed for each test activity.

Drafts of the documentation and prototypes of the software may be used for the system test of documentation. Using drafts and prototypes is particularly relevant in Agile development environments.

7.3.3 Creating the system test plan for documentation

The system test plan for documentation complements a product system test plan and illustrates what needs to be done to validate the end-user support materials that are produced. The system test plan for documentation specifies the documentation and software products subject to test and describes the strategy, procedures, responsibilities, requirements, schedules, tools, quality goals, measurements, and testing tasks for the user documentation. It also specifies procedures for reporting the results of the testing to the information development team and the project manager.

Ownership and authorship of the system test plan for documentation varies on a project basis, depending on, for example, organizational structure. The system test plan for documentation should be developed, documented, and controlled by someone who has the authority to assign dedicated resources to the testing of the documentation such as the tester or test lead. The author of the system test plan for documentation should work in conjunction with the documentation development team and the software project test team.

The test plan shall include criteria and measures for the integrated software and documentation package to demonstrate compliance with the requirements. Suitable measures for system test of documentation include the following:

— test coverage;

— the value of testing compared to required resources;

— defect numbers;

— defect severity;

— defects fixed; and

— time taken to fix defects.

Problems and nonconformances detected by the documentation system test effort shall be recorded using a problem management process. Problems and nonconformances shall be resolved by the project team. Results of the test activities shall be made available to the designated stakeholders.

7.3.1.1 System test plan for documentation entry and exit criteria

The system test plan for documentation should include entry and exit criteria for the successful completion of the documentation testing activities included in the system test plan for documentation. If there are multiple test stages within a product's schedule, entry and exit criteria should be specified for each stage. The following criteria are provided as guidelines for use in testing documentation in any stage.

General entry criteria:

— system test plan for documentation is reviewed and approved;

— necessary test resources (hardware, software, and testers) are available; and

— sufficient functionality is implemented and included in the software to enable documentation testing.

General exit criteria:

— the defined documentation test cases have been attempted;

— high-severity documentation defects have been resolved (for example, those documentation defects that contain inaccurate or missing information); and

— software product testing (functional verification testing, system verification testing, and so on) is complete.

7.3.2 System test plan for documentation approvals

The system test plan for documentation should be agreed by those responsible for information development, software development, and test. Reviewers of the system test plan for documentation should include the following:

— test lead;

— software development lead;

— information architect; and

— information development lead.

7.3.3 Problem management and the system test of documentation lifecycle

When the results of the system test cases have been analyzed, any problems or discrepancies found shall be reported and stored according to the problem management process of the organization (7.2.5 explains the problem management process). Sufficient details should be provided to the information developers so that they may make the necessary corrections. Where there is a conflict between the documentation and the software, a decision may need to be made as to whether the software or the documentation is incorrect, and which, therefore, needs to be corrected. The severity of the unresolved issues is assessed as part of the exit criteria for acceptance

A retest and regression strategy should be applied for testing updates to the documentation as a result of problem management. Depending on the severity level of the problem or issue, both retesting and regression testing may be performed when a change is made to existing system elements. See 7.2.5 for more information about the problem management process.

7.4 Usability testing of documentation

7.4.1 General

Usability testing shall be carried out using real or representative users. Documentation usability testing is related to user acceptance and validation testing activities (as defined by ISO/IEC/IEEE 29119, parts1-4:2013) and to determine whether the prototype design or the draft documentation being tested meets the users' needs and aids in the safe use of the product. Documentation usability testing occurs throughout the lifecycle, from the early part of the development cycle to when the product is close to release or subsequent to release. Documentation usability testing should be viewed as a complement to inspection and review. Documentation usability testing may be used to measure usability as defined by ISO/IEC 25051:2014. Early testing during the development cycle should use a prototype to evaluate the user interface design and interactions.

Usability tests are the most acceptable method of checking that the information provided in the documentation meets users' needs, and that users can find it, understand it, and apply it. This method is useful for evaluating systems that are partially developed while there is still time to change the documentation.

NOTE 1 The usability of the documentation is not the same as the usability of the software. The usability of the documentation includes structure, content, and formatting considerations that can affect the ability of user to successfully understand and use the software.

As an assurance of usability, a usability analyst may review documentation to assess whether the documentation meets its specified qualitative usability goals (often called a heuristic evaluation). Expert

evaluation should be informed by research and should be conducted by more than one expert since a single expert uncovers only about 35% of the possible issues.

Empirical evaluation is carried out by experts observing test participants (actual users or others who represent the intended audience) using the documentation to perform selected tasks. A range of different recording techniques may be used, such as an observer taking notes during the test, recording user actions by video, or using Concurrent Think Aloud Protocol asking the users to explain what they are doing and why.

Information developers should be aware of usability requirements from the beginning of the project. Usability targets should be built into the structure, content, and format of the documentation and associated user assistance. Therefore, the usability requirements, and the method of testing them, shall be specified in the analysis stage where other user needs are being determined. Testing can be moderated or unmoderated.

Other opportunities for structured and unstructured observation of documentation users may be arranged if there are evaluative usability tests or field trials for different usage situations before general release of the product. In both evaluative usability testing and field trials, problems with the software and its documentation should be identified together and solutions sought to any problems by considering the software and its documentation together.

If evaluative usability testing and field trials highlight major problems with the product, the whole product is likely to require another design stage to resolve the problems. The information, therefore, should go through another design stage as part of this process.

7.4.2 Objectives and activities for usability testing of documentation

The purpose of usability testing of user documentation is to provide objective evidence that the documentation is sufficient to allow users to perform required functions using the system and that some measure is made of user experience and satisfaction.

The following activities shall occur before the actual usability testing:

- requirements for documentation usability testing are established;
- recruitment requirements, including sample sizes, informed consent, compensation, etc. are determined;
- criteria for documentation usability testing are identified; and
- a test protocol is developed (for example, pass/fail criteria, the involvement of actual users, and test methods).

During the usability test, data shall be collected to provide information for corrective action.

The following activities shall occur after usability testing:

- results of the documentation usability test activities should be made available to other interested parties and recommendations should be made to resolve problems; and
- evidence should be provided that the software and documentation are fit for their purpose, meet the users' needs, and are suitable for their intended use.

7.4.3 Measures and metrics for documentation usability testing goals

The usability of the documentation is an integral part of the usability of the software product. When the usability targets are set and measured for the product, the documentation shall be treated as an integral part of the product. Measures of the usability of the documentation, independent of the usability of the software, shall include the following:

— the time taken to perform a specified task using the instructions in the documentation;

— the ability of the users to accomplish the task at hand using the documentation;

— the comprehensibility of the documentation to the users;

— the time taken by users to navigate to documentation sections needed to accomplish their goals; and

— the user experience as a whole (satisfaction, loyalty, trust, etc.).

Common metrics used for usability testing from Common Industry Format for Usability Test Reports (ISO/IEC 25062:2006), are the following:

— efficiency;

— effectiveness; and

— satisfaction.

The usability targets for the software system and the documentation determine the usability test methods to be used.

Once an analysis of usability requirements has been made, the usability analysts or the test team should translate those requirements into usability goals for the documentation. The goals are the qualitative or quantitative targets that are measured in usability tests.

7.4.4 Planning documentation usability tests

A usability test plan shall be developed and documented by either the usability analysts on the project, the test lead, or the information developer who is responsible for the content. The plan shall include, but is not limited to, the following:

— the documentation and software products to test;

— the usability protocols to be used and their logical timing during the project; and

— resources, responsibilities, and schedule for the documentation usability testing, including testing for translation and localization;

— the recruitment plan for test participants;

— considerations for the safety and comfort of test participants;

— platforms and environments to be tested; and

— process for identifying problem severity.

During the testing, participants can be observed by a usability analyst as they work with the documentation, performing tasks designed to test the documentation against the defined usability goals stated in terms of user effectiveness and efficiency. Test participants can also record data in the case of unmoderated testing. A questionnaire may be used to assess the level of user satisfaction. The tests are performed in a specified context of measurement, which is related to the context of the use of the product. The resulting performance levels are compared with the required levels. These measures of assurance can provide a thorough assessment of the usability of the documentation.

NOTE 1 An increasing amount of non-moderated testing is now performed remotely.

To perform documentation usability testing, the documentation should be tested with a prototype or simulation of the software it supports. Documentation usability test participants shall have access to the software to perform specified tasks. Usability testing may take place before the software and documentation are available. For example, card sorting, reverse card sorting, and first-click can all be done in advance of software availability. Rapid paper prototyping can be conducted before the hardware or software design is complete.

Methods for documentation usability testing may include:

— **Paper prototyping.** Paper prototyping is commonly used early in the design process to obtain quick feedback on content arrangement, task progression, and hierarchy. Low-fidelity designs allow for quick exploration of ideas and, more importantly, identify design issues so they can be resolved through iteration before moving on to higher fidelity designs. Test participants engage fully with a moderator providing input on all parts of a design and may even identify possible design solutions;

— **Card sorting.** Card sorting allows representative users to organize information according to their mental models and provides critical insights into the navigational cues users are expecting. Open card sorting allows participants to group and provide category labels in ways that make sense to them. In a closed card sort activity, the information developer provides categories into which the participants sort content. Card sorting techniques can also be used in instances where researchers are interested in how people group items and what the strength of the relationships are within these groupings;

— **First-click navigation paths.** Test participants or automated systems can provide feedback on the start of a task or the beginning point within a task by recording the cursor position and keystroke. This information allows the usability analyst or the information developer to determine if user behaviour matches the design expectation; and

— **Readability.** Measures of comprehension and understanding can be used to assess participant expectations and perceptions around items such as degree of difficulty. Read aloud, Cloze tests, and vocabulary lists can identify where participants struggle. Readability metrics (such as the Flesch Reading Ease Score or Flesch Kincaid Grade level test) that use sentence length and syllables to give an indication of linguistic complexity should be used with caution.

— **Heuristic evaluation.** Documentation is reviewed by a usability analyst to assess whether the documentation meets its specified qualitative usability goals;

— **Usability testing.** A representative user or test participant is observed performing tasks using the software and documentation. The usability analyst records the actions the user took, problems the user encountered, and comments the user made during the test. The usability analyst may also record other information, such as time-on-task and number of keystrokes used to complete a task, as well as the identification of product or documentation problems;

— **Video analysis.** A representative user or test participant is recorded performing tasks using the software and documentation. The user interface may also be filmed or recorded. These videos can be played back later to record the user actions and problems or to show the developers how the user interacts with the software and documentation; and

— **Contextual observation.** Representative users or test participants are observed performing tasks using the software and documentation in their actual business environment by usability analysts. The usability analyst records the actions the user took, problems the user encountered, and comments the user made during the contextual observation.

Methods for debriefing after documentation usability testing may include:

— **User debrief by usability analysts.** Representative users are questioned on their experiences and satisfaction by usability analysts before and after a test session, as well as before and after performing tasks using the software and documentation. The usability analyst records the responses of the users or customers; and

— **User questionnaire analysis.** Representative users complete questionnaires on their experiences and satisfaction after performing tasks using the software and documentation. The responses in the questionnaires are recorded and reported to the development teams.

7.4.5 Performing usability evaluation of documentation

7.4.5.1 General

The usability tests shall be performed according to the usability test plans. Usability testing is typically broken into four stages that include the following:

— participant setup and readiness;

— execution of the test session;

— conclusion of the test session; and

— examination and analysis of test data.

A usability tester shall help ensure that the systems for testing and associated facilities are available and ready to perform usability testing. The person responsible for planning the test may also be the test lead or usability analyst. The usability tester shall identify any concerns with the data collected during the analysis.

The project team shall make available the usability test data according to legal, regulatory, data handling, and product sector requirements.

7.4.5.2 Usability test reports of the documentation

The usability analyst shall analyze and report usability test data according to criteria defined in the usability test plan.

A standard format for usability test reports is provided by ISO/IEC 25062:2006 and ISO/IEC 25066:2015. Each usability test should be documented in a test report. The usability test report should include the following information:

— an executive summary that includes the top three findings, the top three issues, and the associated recommendations;

— details of the product and version under test;

— details of the test protocol;

— a description of the product and the test objectives;

— methods used, including sufficient test steps that allow an independent tester to replicate the procedure used in testing;

— descriptions of participants and the recruitment process;

— context of product use in the test;

— tasks performed;

— test facilities and equipment used;

— results including data collection, data analysis, data scoring, data reduction, and statistical analysis;

— performance results including confidence intervals;

— satisfaction results;

— participant questionnaires, participant general instructions, and participant task instructions; and

— recommendations.

7.4.6 Problem management for documentation usability tests

Usability tests can highlight problems ranging from the design of the documentation or software to general defects.

The problem management process is a process for analyzing and resolving the problems (including nonconformances), regardless of their nature or source, which are identified during the test or review activities. The objective is to provide a timely, responsible, and documented means to analyze and resolve all identified problems and to recognize trends.

When problems (including nonconformances) have been detected in a document or software product, a problem report shall be prepared by the usability analyst to describe each problem detected.

Problem management may be used during early usability testing; however, it should be used when performing evaluative usability testing.

NOTE 1 Agile development can require continuous assessment with multiple reviews.

The problem report shall be used as part of a process to identify the root cause and resolve the problem. Use of an ISO 9001 compliant quality management system includes processes to handle nonconforming product requirements.

If problems are detected during the review or testing of the documentation or software product, a process should be in place to re-review or retest the area where the problem was found so that the problem is resolved and that no further defects have been introduced.

NOTE 2 Testing of documentation can highlight problems with the software being documented. Resolving problems with the software is not in the scope of this document.

7.5 Accessibility testing of documentation

7.5.1 Scope of accessibility testing

Accessibility means enabling hardware, software, and services to be used by people either directly or in combination with assistive technology products. Accessibility requirements extend usability requirements so that the documentation is provided in a suitable format for the users of the software product.

NOTE 1 The U.S. Government has published specific requirements that include software accessibility known as Section 508 of the Rehabilitation Act (see the Bibliography for the URL to Section 508).

NOTE 2 Content for mobile devices can require specialized accessibility testing for a variety of devices.

Accessibility testing may need to be performed on the following types of documentation:

— printed manuals and other documentation;

— online documentation; and

— the user interface of online documentation including navigation, links, metadata associated with information objects, etc.

Accessibility testing of documentation should be included as part of the product test cycle so that people with disabilities can use the documentation. Accessibility testing of the documentation should be performed by the documentation tester or by a specialized accessibility tester. After the documentation has been created, the product should be checked that it complies with accessibility requirements. Several tools such as online checkers and assistive technologies are available to verify that documentation is accessible to people with disabilities.

NOTE A good starting point for Accessibility test tools is the Web Accessibility Evaluation Tool List (http://www.w3.org/WAI/ER/tools/).

7.5.2 Performing accessibility tests

The following techniques should be used to test the accessibility of electronic documentation:

— assistive technologies that use hardware or software to increase accessibility such as braille readers, screen readers, screen magnification software, and eye tracking devices; and

— web checking tools for HTML documentation that include software or web-based services to check website compliance with established accessibility guidelines.

If possible, include people with disabilities in usability tests of the product. The W3C Web Accessibility Initiative website (http://www.w3.org/WAI/intro/wcag) references resources and tools that can be used to check documentation accessibility.

7.6 Translation and localization review and testing

7.6.1 General

Language and cultural requirements have a significant impact on the design of documentation, including schedules, costs, presentation formats, writing style, and usability testing. Depending on organizational and regulatory requirements, the content may need to be translated and may also need to be localized. The product manager should determine in which countries the content is used and if translation and localization is required. Reviewers and testers of the translated and localized content should know the target language and have the necessary technical knowledge.

7.6.2 Planning for translation and localization review and testing

The following factors should be specified in a test plan for translated and localized versions:

— how the translated localized versions are reviewed and tested;

— who is responsible for reviewing the accuracy of the translated and localized versions;

— what system resources are needed to test the translated and localized versions; and

— when the translated and localized versions are available.

7.6.3 Performing translation and localization review and testing

Localized information shall be reviewed and tested.

The types of problems that may be identified during localization review and testing include the following:

— inadequate translations of text due to errors in word choice;

— editorial errors in grammar and spelling;

— composition errors in page layout, including missing text;

— missing translations of the text in images and diagrams;

— localization errors due to inadequate choice of examples, illustrations, and other culturally significant subjects in the original language; and

— compliance with local laws and regulations.

NOTE Usability testing of text in different languages is not the same as testing for translation adequacy.

Annex A
(informative)

User-centered test and review guidelines

These guidelines are focused on activities that impact the quality of information for users and that support stakeholders' needs and requirements. In addition to using these guidelines, a review should be conducted to validate that the grammar, spelling, usage, punctuation, and graphics conform to organizational guidelines and standards.

The material in this annex includes guidelines for both printed and electronic information unless stated otherwise.

A.1 Support for an action-oriented approach

A.1.1 Inclusion of only necessary information

1. The **number of pages or topics** that users would need to read in printed or electronic documentation before they get to do something they recognize as real work (not simply installing the product or logging on to software) is reviewed and minimized.

2. Only **essential information** is included in introductory sections.

3. Prefaces containing descriptions of the text have been excluded.

4. Only **essential product descriptions are** included.

5. **Chapters or sections** are written without introductions that distract users from the real tasks they want to perform. Chapter tables of contents are included only if they perform a useful function in electronic content rather than simply occupying space.

6. Only **instructions** that users are unable to complete on their own are included. Instructions that describe and point out the obvious, e.g., how to complete the fields in a simple form, are avoided.

A.1.2 Assistance for users to easily understand and use task instructions

1. **Real work** is emphasized instead of using the features and functions of the product.

2. **Topics** cover only one subject or answer only one question.

3. **Advance organizers** explain how a group of tasks is interrelated or describe a broad process that requires multiple tasks to complete.

4. **Extended conceptual** and background information is separated from tasks and reference materials. Extended conceptual information is not buried in the middle of a task.

5. **Reference** information is separated from task steps and incorporated into tables or flow charts that are easier to scan and use.

6. **Procedural steps and process flows** are separate from long paragraphs of text.

7. **Procedural steps** begin with an action verb that signifies the action that users perform. Exceptions might be procedures that begin with a conditional phrase.

8. **Step results** are separated from step actions. Step results that are obvious, i.e., "a screen appears," are avoided.

9. Users' attention is directed to the **product interface**, encouraging them to learn from hands-on experience.

10. The **post-requisite of a task** (if applicable) provides the users with a transition to the next task in a task sequence.

11. **Closure** helps users know when a task is complete if it is not obvious.

A.2 Support for real tasks

A.2.1 Information keeps user needs and tasks in mind

1. **User Personas** (based on research) are developed so that learning needs and task goals are well understood.

2. **Topic titles** are written in users' language rather than product or systems terminology so that users recognize their goals in the topic titles.

3. **User tasks** emphasize achieving user goals rather than using the product's features and functions.

4. **Terminology** is used that is familiar to the users.

5. Text that has a product point of view is changed to a **user point of view**.

6. Information for different **audiences** is placed in separate sections.

7. In **online content**, novice users can access additional information that provides more detail on performing a step.

8. Users acquire experience using the product before they are required to learn product terminology.

9. Users can readily find **information about unfamiliar terms or names of parts** without needing to learn a list of new terms or names of parts.

A.2.2 Task instructions support real user activities

1. **Real scenarios** from the users' environment enable them to find solutions to complex problems.

2. **Tasks are presented** in the order in which they are performed.

3. Only **actions** or **concepts** that the users do not already know how to perform or are likely to misunderstand are included.

4. Only **conceptual** information that is necessary for users to successfully perform their tasks is included.

5. Users are provided with **basic tasks** they recognize as real work so they can start using the product right away.

6. Only descriptive or **conceptual information** that enables users to perform their tasks more successfully is included. Do not simply pass on content from the product specifications.

7. **Conceptual information** is presented as complete topics that help users understand how to accomplish real work. Do not provide conceptual information only as snippets buried in task topics that do not add up to complete information.

A.3 Support for error recognition and recovery

A.3.1 Troubleshooting information assists users in error recovery

1. A separate **troubleshooting section** is provided.

2. **Troubleshooting informatio**n in the task is labeled so that it is easily accessible.

3. Explanations for **undoing** actions or **reverting** to an earlier state help users feel confident about successfully using the product.

4. Problems and error recovery are described from the **users' point of view** and in their language.

5. **Troubleshooting information** is tailored to user profiles to meet their particular needs.

6. Different types of **remedial actions** are provided for users who have different levels of experience and expertise.

7. **Questions** from customers that are posted to product support websites or called in to customer support are monitored and the answers are applied to later releases of the documentation.

A.3.2 Information helps users prevent errors

1. **Explicit steps** help prevent common mistakes within the task itself.

2. **Troubleshooting information** is provided in the task when a mistake is likely to occur.

3. **Instructional steps** include preventive actions before hazards are or can be encountered

4. **Hazard statement**s are included only when necessary.

5. A **shift in tone or writing style** is used in areas where a significant error is likely to occur, where consequences are severe, or where a user can miss a critical action or concept while performing a task.

A.4 Support for information access

A.4.1 Navigational elements facilitate information access

1. The **table of contents** has sufficient heading levels to be useful.

2. If applicable in the environment, texts have a **table of contents** that can serve as a quick reference for the content.

3. The titles in the **table of contents** are meaningful and reflect the users' goals.

4. The titles and structure of the **table of contents** reflect the users' workflow.

5. An **index** is complete, accurate, useful, and organized by terms that users are likely to look up.
6. **Alternatives** to downloading large PDFs on websites are provided (electronic only).
7. A website search function enables users to find information inside of a PDF without performing a secondary search (electronic only).
8. User search terms are researched and added to the **index** and **metadata**, if applicable (electronic only).
9. **Topic metadata** enhances searchability online (electronic only).
10. A website's **search system** returns topics based on title, first paragraph, and metadata (electronic only).
11. The **search system** allows users to narrow their searches based on facets such as product name, product features, user role, and information type (electronic only).
12. The **search system** returns the best topics for common user searches (electronic only).
13. **Links** to relevant additional information as enhancements to the topics are provided and inline links are eliminated (electronic only).
14. The **search** system allows users to view and print an individual topic (electronic only).
15. The context of an **individual topic**, in the larger collection of topics or the table of contents (e.g., viewable table of contents, page headers and footers, breadcrumb paths) is clear to users.
16. Different instances of a topic clearly indicate the **product or version** of the product to which they apply.

A.4.2 Accessibility aids are included (electronic only)

1. Users with low vision can **access content** in various ways (e.g., through screen reader, keyboard shortcuts, or tool tips).
2. Content such as audio, animations, or graphics has additional **access methods** such as alternative text.
3. **Type sizes and colors** suitable for color blind or low vision users are used.

A.5 Content for translation

1. All **instances of a word** are spelled the same way.
2. **Terms** are used consistently and have only one meaning.
3. **Terms** that can be used as both a noun and a verb are avoided (English only).
4. The use of **uppercase and lowercase** is consistent.
5. **Acronyms and abbreviations** are translatable.
6. **Contractions** are used consciously, as needed for audience and tone of voice (English only).

7. **Definite articles** in relevant languages are included.

8. The word **"that"** is used before restrictive clauses (English only)

9. A **list or a table** is not inserted in the middle of a sentence.

10. **Pronouns** like "this" or "it" are not used as the subjects of sentences (English only).

11. **Symbols l**ike "/" or "&" are not used in text.

12. **Noun clusters**, **multiple modifiers** of a noun, or modifiers that might have multiple meanings are not used.

13. Examples that are related to a particular **culture**, including place names, holidays, and people, that readers in other countries would not recognize, are not used.

14. Specific **religious references** are not used in examples.

15. Dates, times, and telephones numbers are written correctly for each **locale**.

16. **Local addresses and telephone numbers** are used where available.

17. **Technical support information** has the correct support emails and telephone numbers available for the locale.

18. The language has been reviewed for **adequate style and tone** for the locale. Idiomatic expressions, colloquialisms, humor, and irony may be difficult to translate or unknown to non-native readers.

19. **Metaphoric expressions** that may be difficult to translate or unknown to non-native readers have not been used.

20. **Illustrations** are reviewed and revised for locale-specific details.

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Abstract: This document supports the need for software users to receive consistent, complete, accurate, and usable documentation. This document was developed to assist those who review, assess, and test software user documentation as part of the software lifecycle process. It is not limited to the review and test phase of the software lifecycle, but includes activities throughout the information management and documentation management processes. This document applies to printed and electronic documentation such as user manuals, online help, instructions, user assistance, tutorials, websites, and user reference documentation. Much of its guidance is applicable to user documentation for systems as well as the software used to control machinery or hardware devices. It applies to both initial development and subsequent releases of the software and user documentation. This document is intended for use by all types of organizations, whether or not a dedicated documentation department is present. Readers are assumed to have experience with or general knowledge of reviewing and testing processes.

Keywords: software documentation review, software documentation testing, user documentation, testing and reviewing user documentation, usability testing

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