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Systems and software engineering — Content of life-cycle information items (documentation)

Ingénierie des systèmes et du logiciel — Contenu des articles d'information du cycle de vie (documentation)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non- governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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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ISO/IEC/IEEE 15289 was prepared by Joint 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 cancels and replaces the first edition (ISO/IEC 15289:2011), of which it constitutes a minor revision. This second edition reflects ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) and ISO/IEC 20000-2:2012 (IEEE Std 20000-2-2013), which replaced ISO/IEC 20000-1:2005 and ISO/IEC 20000-2:2005.

Introduction

The purpose of this International Standard is to provide requirements for identifying and planning the specific information items (information products) to be developed and revised during systems and software life cycles and service processes. This International Standard specifies the purpose and content of all identified systems and software life-cycle information items, as well as information items for information technology service management. The information item contents are defined according to generic document types and the specific purpose of the document. Information items may be combined or subdivided as needed for project or organizational purposes.

This International Standard is based on the life-cycle processes specified in ISO/IEC 12207:2008 (IEEE Std 12207-2008), *Systems and software engineering — Software life cycle processes*; ISO/IEC 15288:2008 (IEEE Std 15288-2008), *Systems and software engineering — System life cycle processes*; and the service management processes specified in ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013), *Information technology — Service management — Part 1: Service Management System Requirements*; and ISO/IEC 20000-2:2012 (IEEE Std 20000-2-2013), *Information technology — Service management — Part 2: Guidance on the application of service management systems*.

IEEE contributed IEEE Std 12207.1-1997, *IEEE Guide for Information Technology — Software Life Cycle Processes — Life Cycle Data. (ISO/IEC 12207) IEEE Guide for Standard for Information Technology — Software life cycle processes — Life cycle data*, as a source for this International Standard

Systems and software engineering — Content of life-cycle information items (documentation)

1 Scope

This International Standard specifies the purpose and content of all identified systems and software life-cycle and service management information items (documentation). The information item contents are defined according to generic document types, as presented in Clause 7, and the specific purpose of the document (Clause 10).

This International Standard assumes an organization is implementing life-cycle processes, or practicing service management, using one or more of the following:

- ISO/IEC 15288:2008 (IEEE Std 15288-2008), Systems and software engineering — System life cycle processes,
- ISO/IEC 12207:2008 (IEEE Std 12207-2008), Systems and software engineering — Software life cycle processes
- ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013), Information technology — Service management — Part 1: Service management system requirements

This International Standard provides a mapping of ISO/IEC 15288:2008 (IEEE Std 15288-2008), ISO/IEC 12207:2008 (IEEE Std 12207-2008), and ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) and ISO/IEC 20000-2 (IEEE Std 20000-2-2013) clauses with a set of information items. It provides a consistent approach to meeting the information and documentation requirements of systems and software engineering and IT service management.

ISO/IEC 12207:2008 (IEEE Std 12207-2008) and ISO/IEC 15288:2008 (IEEE Std 15288-2008) define a set of processes for managing and performing the stages of a systems life cycle. They define an Information Management process, but they do “not detail documentation in terms of name, format, explicit content, and recording media”. ISO/IEC 15288:2008 (IEEE Std 15288-2008), and ISO/IEC 12207:2008 (IEEE Std 12207-2008) establish a common framework for software life-cycle processes and in passing identify or require a number of documentation items. Its process reference model does not represent a particular process implementation approach, nor does it prescribe a system/software life-cycle model, methodology, or technique. ISO/IEC 12207:2008 (IEEE Std 12207-2008) does not always specify when software information items are to be prepared, nor does it identify information item contents. ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) establishes comprehensive requirements for documents and records, with some specific requirements. ISO/IEC 20000-2:2012 (IEEE Std 20000-2-2013), Information technology — Service management — Part 2: Guidance on the application of service management systems provides guidance on the use of Part 1.

The generic document types (which may be referred to as information item types) are to be used to identify the information necessary to support the ISO/IEC 15288:2008 (IEEE Std 15288-2008) agreement, enterprise, project, and technical processes; the ISO/IEC 12207:2008 (IEEE Std 12207-2008) primary, supporting, and organizational life-cycle processes; or the ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) service management system (SMS), service delivery, relationship, resolution, and control processes.

For each life-cycle process or service, it would be possible to prepare a policy, plan, procedures, and reports, as well as numerous records, requests, descriptions and specifications. Such an elaboration of the documentation schema would be more rigorous than specified by ISO/IEC 15288:2008 (IEEE Std 15288-2008) or ISO/IEC 12207:2008 (IEEE Std 12207-2008). As ISO/IEC 15288:2008 (IEEE Std 15288-2008) points out (1.4), “This

International Standard does not detail the life-cycle processes in terms of methods or procedures required to meet the requirements and outcomes of a process." Thus, information items may be combined or subdivided as needed for project or organizational purposes, as further defined in Clause 2, Applicability, and Clause 3, Conformance.

This International Standard does not establish a service management system.

The scope of this International Standard does not include the following:

a) the format or content of recommended input data or input information items, except for the content of those input items that are also output information items;

b) instructions on combining or subdividing information items and information item contents of a similar nature;

c) guidance on selecting an appropriate presentation format, delivery media, and maintenance technology for system and software life-cycle data, records, information items, or documentation, such as electronic publishing systems, content management systems, or data repositories;

NOTE 1 ISO/IEC/IEEE 26531, System and software engineering — Content management for product life-cycle, user, and service management documentation, provides requirements for content management and component content management systems.

d) detailed content for information items related to general business, organizational, and financial management that is not specific to systems and software engineering and information technology service management, such as business strategies, human resources and investment policies, personnel selection criteria, financial budgeting and accounting policies and procedures, cost reports, or payroll data;
e) information items showing only approval of an ISO/IEC 12207:2008 (IEEE Std 12207-2008) subclause, such as ISO/IEC 12207:2008 (IEEE Std 12207-2008), 6.1.2.3.4.5;
f) any ISO/IEC 15288:2008 (IEEE Std 15288-2008) or ISO/IEC 12207:2008 (IEEE Std 12207-2008) subclause not explicitly or implicitly identifying the recording of information about an activity or task, for example, ISO/IEC 12207:2008 (IEEE Std 12207-2008), 6.4.4;
g) work products, models, software, and other artifacts of life-cycle products and services that are not information items or records used in information items.

NOTE 2 ISO/IEC 26514:2008, Systems and software engineering — Requirements for designers and developers of user documentation, provides guidance on formats for software user documentation.

NOTE 3 ISO/IEC 15504-5:2012, Information technology — Process Assessment — Part 5: An exemplar software life cycle process assessment model, Annex B (informative), and ISO/IEC 15504-6:2013 Information technology — Process assessment — Part 6: An exemplar system life cycle process assessment model, Annex B (informative) detail the content of work products as well as information items. Their guidance includes descriptions of a set of information items (documents) that an assessor may encounter. The information items in their guidance may be produced by combinations and subdivisions of the required information items in this International Standard.

2 Applicability

2.1 Purpose

The purpose of this International Standard is to provide requirements for users of ISO/IEC 12207:2008 (IEEE Std 12207-2008), ISO/IEC 15288:2008 (IEEE Std 15288-2008) and ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) for identifying and planning the specific information items (information products) to be developed and revised during systems and software life cycles and service management processes. This International Standard is intended for use as follows.

a) To address the technical information needed by those involved in ISO/IEC 15288:2008 (IEEE Std 15288-2008) and ISO/IEC 12207:2008 (IEEE Std 12207-2008) processes.

b) To specify information in an agreement process as described in ISO/IEC 15288:2008 (IEEE Std 15288-2008) or a two-party situation as described in ISO/IEC 12207:2008 (IEEE Std 12207-2008), ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) and ISO/IEC 20000-2:2012 (IEEE Std 20000-2-2013). The two-party situation may range from an informal agreement within an organization to a legally binding contract between organizations.
c) To develop information items that provide evidence for process assessment performed with respect to ISO/IEC 15504, and to guide process improvement activities.
d) To guide a single party in self-imposed tasks.

2.2 Intended users of this International Standard

This International Standard is applicable for use by:

a) project managers responsible for the Information Management process of ISO/IEC 15288:2008 (IEEE Std 15288-2008) (6.3.6) during a system life cycle;
b) project managers responsible for identifying information item requirements and document contents when using ISO/IEC 12207:2008 (IEEE Std 12207-2008), or any other software engineering life-cycle process, to help determine what should be documented, when the documentation should be developed, and what the contents of the documents should be;
c) acquirers responsible for determining what information items are needed to help ensure the quality of the project, or delivered system, product or service;
d) individuals who write or support the design and development of service, systems and software information items;
e) individuals responsible for identifying information items required to claim conformance with ISO/IEC 12207:2008 (IEEE Std 12207-2008), ISO/IEC 15288:2008 (IEEE Std 15288-2008), or ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013);
f) individuals undertaking service, system or software process improvement in their organizations.

2.3 Applicability to work efforts

Use of this International Standard is not limited by size, complexity or criticality of the project. It may be applied to:

a) any type of project and life-cycle process;
b) any of the activities and tasks of a project and system or software product or service life cycle;
c) all forms of information items, information item content and document delivery media;
d) documentation in Commercial-Off-The-Shelf (COTS) products when the COTS product is specified as a deliverable under a two-party situation.

NOTE See ISO/IEC 12207:2008 (IEEE Std 12207-2008), 1.2.

2.4 Applicability to information item audiences

Users of this International Standard should map this International Standard to the requirements and needs of their agreements, or project and organizational procedures. The type of decision to be made or the work to be performed, by users of the information should be considered before an information item is prepared. Reviewing and understanding the requirements, needs, and background of users and stakeholders are essential to applying this International Standard accurately and economically, since some information items are designed for various purposes and user groups:

a) To provide information to specialized types of users who may not be a part of a particular project;
b) To address the same type of user but in environments not normally coexisting in the same effort;
c) To aid both users who are expected to be computer-literate and understand technical terminology, and users who may not have this background.

3 Conformance

3.1 Definition of conformance

This International Standard may be used as a conformance or a guidance document for projects and organizations claiming conformance to ISO/IEC 15288:2008 (IEEE Std 15288-2008), ISO/IEC 12207:2008 (IEEE Std 12207-2008), or ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013).

NOTE 1 Service providers should refer to ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013) and ISO/IEC TR 20000-3:2012 regarding claims of conformance for a defined certification scope, for example, organizational units, services, location.

NOTE 2 ISO/IEC 20000-1:2011 is a management system standard stating requirements for service providers. Some requirements of this standard are not requirements of ISO/IEC 20000-1. Some requirements of ISO/IEC 20000-1 are not requirements of this standard.

If the selected system or software life-cycle processes have been tailored in conformance with ISO/IEC 15288 or ISO/IEC 12207, to claim conformance to this International Standard, the user of this International Standard shall prepare the information items identified in this International Standard applicable to the selected and tailored ISO/IEC 15288:2008 (IEEE Std 15288-2008), ISO/IEC 12207:2008 (IEEE Std 12207-2008), processes.

The generic and specific record and information item titles and contents in Clauses 7, 9, and 10 of this International Standard may be tailored to satisfy requirements of an organization, its projects, or agreements based on the tailored conformance to ISO/IEC 15288:2008 (IEEE Std 15288-2008) or ISO/IEC 12207:2008 (IEEE Std 12207-2008). In tailoring, information items provided in this International Standard may be modified (added to, combined or retitled). The contents of the information items shall correspond to the selected and tailored processes.

NOTE 3 Annex A of ISO/IEC 15288:2008 (IEEE Std 15288-2008) and ISO/IEC 12207:2008 (IEEE Std 12207-2008) provide requirements for the Tailoring Process.

In this International Standard, for simplicity of reference, each information item is described as if it were published as a separate document. However, information items shall be considered as conforming if they are unpublished but available in a repository for reference, divided into separate documents or volumes, or combined with other information items into one document. Use of the nomenclature of the specific records in Clause 9 or the information item titles in Clause 10 is not required to claim conformance with this International Standard.

Throughout this International Standard, “shall” is used to express a provision that is normative, “should” to express a recommendation among other possibilities, and “may” to indicate a course of action permissible within the limits of this International Standard.

The verb “include” used in this International Standard indicates that either (1) the information is present or (2) a reference to the information is listed.

3.2 Conformance situations

Conformance may be claimed for organizations, projects, multi-supplier projects, services, and information items, as identified in the claim of conformance:

a) When conformance is claimed for an organization or a service provider, the organization or service provider shall make public a document declaring its tailoring of the records and information items, and its interpretation of any clauses of the standard that reference “the contract.”
b) When conformance is claimed for a project (or program), the project plans or the contract shall document the tailoring of the records and information items, and the interpretation of any clauses of the standard that reference “the contract.”

c) When conformance is claimed for multi-supplier projects, it may be the case that no individual project can claim conformance because no single contract calls for all the required records and information items. Nevertheless, the projects, as a whole, may claim conformance if each of the required records and information items is produced by an identified party. The program plans shall document the tailoring of the records and information items, and their assignment to the various parties, as well as the interpretation of any clauses of the standard that reference "the contract."
d) When conformance is claimed for an information item, the item shall contain the generic contents required in Clause 7 of this International Standard and the specific content required in Clause 10.

NOTE 1 One possible way for an organization to deal with clauses that cite "the contract" is to specify that they shall be interpreted in the project plans for any particular project. A project's claim of conformance is typically specified with respect to the organization's claim of conformance.

NOTE 2 In accordance with ISO/IEC 17000:2004, *Conformity assessment — Vocabulary* and general principles, an organization or a project or a multi-supplier program may be said to comply with this document when its products (the information items) fulfill the requirements, but the organization, project or program has not met the specific requirements for conformance stated in items (a), (b) or (c) above.

3.3 Type of conformance

One of the following types of conformance shall be asserted. The selected type shall be identified in the claim of conformance:

a) Tailored: The minimum set of required information items is determined by tailoring of processes and activities in accordance with Annex A of ISO/IEC 12207:2008 (IEEE Std 12207-2008) or Annex A of ISO/IEC 15288:2008 (IEEE Std 15288-2008).
b) Absolute: The minimum set of required information items is all of those specified as normative (that is, clauses containing "shall") in the text of the normative reference standards.

NOTE Absolute conformance may be claimed for selected processes or information items even if absolute conformance with the entire standard is not claimed.

4 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 12207:2008 (IEEE Std 12207-2008), *Systems and software engineering — Software life cycle processes*

ISO/IEC 15288:2008 (IEEE Std 15288-2008), *Systems and software engineering — System life cycle processes*

ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013), *Information technology — Service management — Part 1: Service management system requirements*

5 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC/IEEE 24765 (available at www.computer.org/sevocab and the following apply.

NOTE ISO/IEC 20000-1:2011 contains different definitions for the terms document, procedure, record and service request. The definitions used in ISO/IEC 20000-1 should be used when conforming to that standard.

5.1
approval
notification by an authorized representative that a deliverable item appears to satisfy requirements and is complete

Note 1 to entry: Such approval does not shift responsibility from the supplier to meet requirements under a two-party situation.

5.2
complaint
record of perceived non-compliance with a service level agreement or customer dissatisfaction with service

5.3
complete [documentation]
including all critical information and any necessary, relevant information for the intended audience

5.4
consistent
without internal conflicts

5.5
Commercial-Off-The-Shelf
COTS
product available for purchase and use without the need to conduct development activities

5.6
criteria
rules on which a judgment or decision can be based, or by which a product, service, result, or process can be evaluated

5.7
critical information
information describing the safe use of the software, the security of the information created with the software, or the protection of the sensitive personal information created by or stored with the software

[SOURCE: ISO/IEC 26514:2008]

5.8
database
collection of data organized according to a conceptual structure describing the characteristics of the data and the relationships among their corresponding entities, supporting one or more application areas

5.9
description
information item that represents a planned or actual concept, function, design, or object

5.10
document
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.

5.11
documentation plan
plan identifying the documents to be produced during the system or software life cycle

5.12
include [information]
having either the information or a reference to the information present in the document

5.13
information item
separately identifiable body of information that is produced, stored, and delivered for human use

Note 1 to entry: "information product" is a synonym. A document produced to meet information requirements can be an information item, or part of an information item, or a combination of several information items.

Note 2 to entry: An information item can be produced in several versions during a project life cycle.

5.14
information item content
information included in an information item, associated with a system, product or service, to satisfy a requirement or need

5.15
information item type
group of information items consistent with a pre-arranged set of generic criteria

Note 1 to entry: "generic document type" is a synonym.

EXAMPLE A "plan" is the information item type for all plans and "report" is the information item type for all reports.

5.16
modifiable
structured and has a style such that changes can be made completely, consistently, and correctly while retaining the structure

5.17
plan
information item that presents a systematic course of action for achieving a declared purpose, including when, how, and by whom specific activities are to be performed

5.18
policy
clear and measurable statement of preferred direction and behavior to condition the decisions made within an organization

[SOURCE: ISO/IEC 38500:2008]

5.19
presentable
retrievable and viewable

5.20
procedure
information item that presents an ordered series of steps to perform a process, activity, or task

Note 1 to entry: A procedure defines an established and approved way or mode of conducting business in an organization. It details permissible or recommended methods in order to achieve technical or managerial goals or outcomes.