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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) 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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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Systems and software 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 third edition cancels and replaces the second edition (ISO/IEC/IEEE 15289:2015), of which it constitutes a minor revision. This third edition reflects ISO/IEC/IEEE 15288:2015, *Systems and software engineering—System life cycle processes*, which replaced ISO/IEC 15288:2008 (IEEE Std 15288:2008).

Introduction

The purpose of this document 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 document 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 are combined or subdivided as needed for project or organizational purposes.

This document 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/IEEE 15288:2015, *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*.

ISO/IEC 12207:2008 (IEEE Std 12207-2008) and ISO/IEC/IEEE 15288:2015 define a set of processes for managing and performing the stages of a system life cycle. They define an Information Management process, but they do “not detail information items in terms of name, format, explicit content, and recording media”. ISO/IEC/IEEE 15288:2015, and ISO/IEC 12207:2008 (IEEE Std 12207-2008) establish a common framework for systems and software life-cycle processes and identify or require a number of documentation items. Their 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.

IEEE contributed IEEE 12207.1-1997, *Industry Implementation of International Standard ISO/IEC 12207:1995. (ISO/IEC 12207) Standard for Information Technology — Software life cycle processes — Life cycle data*, as a source for the first edition of this document.

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

1 Scope

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

- ISO/IEC 12207:2008 (IEEE Std 12207-2008), Systems and software engineering — Software life cycle processes;
- ISO/IEC/IEEE 15288:2015, 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; and
- ISO/IEC 20000-2 (IEEE Std 20000-2:2013), *Information technology — Service management — Part 2: Guidance on the application of service management systems*.

This document provides a mapping of processes from the above standards to 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.

This document does not establish a service management system.

ISO/IEC 12207:2008 (IEEE Std 12207-2008) and ISO/IEC/IEEE 15288:2015 define a set of processes for managing and performing the stages of a software or system life cycle. They define an Information Management process, but do not “detail information items in terms of name, format, explicit content, and recording media”.

ISO/IEC/IEEE 15288:2015 and ISO/IEC 12207:2008 (IEEE Std 12207-2008) establish a common framework for system and software life-cycle processes. They identify or require a number of documentation items. Their process reference model does not represent a particular process implementation approach, nor prescribe a system/software life-cycle model, methodology or technique.

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), provides guidance on the use of ISO/IEC 20000-1:2011 (IEEE Std 20000-1:2013).

The generic document types defined in this document are used to identify the information necessary to support the following:

- the ISO/IEC/IEEE 15288:2015 agreement;
- organizational project-enabling;
- technical management and processes;
- the ISO/IEC 12207:2008 (IEEE Std 12207-2008) primary, supporting, and organizational life-cycle processes; and

— the ISO/IEC 20000-1:2011 (IEEE Std 20000-1:2013) service management system (SMS), service delivery, relationship, resolution, and control processes.

The generic document types (which can be referred to as information item types) are used to identify the information necessary to support the ISO/IEC/IEEE 15288:2015 agreement, organizational project-enabling, technical management, 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/IEEE 15288:2015 or ISO/IEC 12207:2008 (IEEE Std 12207-2008). As ISO/IEC/IEEE 15288:2015 points out (1.4), “The users of this document are responsible for selecting a life cycle model for the project and mapping the processes, activities, and tasks in this document into that model. The parties are also responsible for selecting and applying appropriate methodologies, methods, models and techniques suitable for the project.” Thus, information items are combined or subdivided consistent with the life cycle model, as needed for project or organizational purposes, as further defined in Clause 4, Applicability, and Clause 5, Conformance.

The scope of this document 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 systems or software life-cycle data, records, information items, or documentation, such as electronic publishing systems, content management systems, or data repositories;

NOTE 1 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.

NOTE 2 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, contractual, organizational, and financial management that is not specific to systems and software engineering and information technology service management, such as business strategies, contract change notices, 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/IEEE 15288:2015 or ISO/IEC 12207:2008 (IEEE Std 12207-2008) subclause not explicitly or implicitly identifying the recording of information about a process, 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 3 ISO/IEC 26514:2008, Systems and software engineering — Requirements for designers and developers of user documentation, provides guidance on formats for user documentation.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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/IEEE 15288:2015, *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*

3 Terms, definitions, and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/IEC/IEEE 24765 (available at www.computer.org/sevocab) 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/>
- IEEE Standards Dictionary Online: available at <http://ieeexplore.ieee.org/xpls/dictionary.jsp>

NOTE ISO/IEC 20000-1:2011 contains different definitions for the terms document, procedure, record and service request. Those definitions are applicable when conforming to that document.

3.1 Terms and definitions

3.1.1

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.

3.1.2

complaint

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

3.1.3

complete [documentation]

including all critical information and any necessary, relevant information for the intended audience

3.1.4

consistent

without internal conflicts

3.1.5

Commercial-Off-The-Shelf

COTS

product available for purchase and use without the need to conduct development activities

3.1.6

criteria

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

3.1.7

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]

3.1.8

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

3.1.9

description

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

3.1.10

document

uniquely identified unit of information for human use

EXAMPLE A 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.

3.1.11

documentation plan

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

3.1.12

include [information]

having either the information or a reference to the information present in the document

3.1.13

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 or system life cycle.

3.1.14

information item content

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

3.1.15

information item type

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

Note 1 to entry: A "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.

3.1.16

modifiable

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

3.1.17**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

3.1.18**policy**

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

[SOURCE: ISO/IEC 38500:2008]

3.1.19**presentable**

retrievable and viewable

3.1.20**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.

Note 2 to entry: According to ISO 9000:2015, procedures can be documented or not.

3.1.21**process**

set of interrelated or interacting activities which transforms inputs into outputs

3.1.22**record**

set of related data items treated as a unit

3.1.23**report**

information item that describes the results of activities such as investigations, observations, assessments, or tests

3.1.24**request**

information item that initiates a defined course of action or change to fulfill a need

3.1.25**service request**

request for information, or for a routine change or procedure with previously evaluated risk

EXAMPLE

A request to provide access to a controlled application, a request to move hardware.

3.1.26**software item**

identifiable part of a software product

EXAMPLE

Identification and descriptions of the software product, source code, software life-cycle data, archive and release data, and instructions for building the executable object code.

3.1.27**specification**

information item that identifies, in a complete, precise, and verifiable manner, the requirements, design, behavior, or other expected characteristics of a system, service, or process

3.1.28

traceable

having components whose origin can be determined

3.1.29

unambiguous

described in terms that allow only a single interpretation, aided, if necessary, by a definition

3.1.30

verifiable

can be checked for correctness by a person or tool

3.2 Abbreviated terms

CFP Call for Proposals

CM Configuration management

COTS Commercial-Off-The-Shelf

ITT Invitation to Tender

RFP Request for Proposal

SLA Service level agreement

SMS Service management system

4 Applicability

4.1 Purpose

The purpose of this document is to provide requirements for users of ISO/IEC 12207:2008 (IEEE Std 12207-2008), ISO/IEC/IEEE 15288:2015, 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 document is intended for use as follows:

- a) To address the technical information needed by those involved in ISO/IEC/IEEE 15288:2015 and ISO/IEC 12207:2008 (IEEE Std 12207-2008) processes;
- b) To specify information in an agreement process as described in ISO/IEC/IEEE 15288:2015 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 33001, and to guide process improvement activities; and
- d) To guide a single party in self-imposed tasks.

4.2 Intended users of this document

This document is applicable for use by the following:

- a) project managers responsible for the Information Management process of ISO/IEC/IEEE 15288:2015 (6.3.6) during a system life cycle;