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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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Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO/IEC/IEEE 15289:2017), which has been technically revised.

The main changes compared to the previous edition are as follows:

— made changes to reflect ISO/IEC/IEEE 12207:2017, which replaces ISO/IEC 12207:2008;

— removed references to ISO/IEC 20000-1:2011 and ISO/IEC 20000-2:2012, which are no longer within the scope of ISO/IEC JTC 1/SC 7 and have been superseded.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these national standards bodies can be found at www.iso.org/members.html.

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/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015. ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015 establish a common framework for system and software life-cycle processes. These standards define an identical process model for the process purposes and outcomes, though their tasks and activities differ. 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. Their processes are grouped in four categories: agreement, organizational project-enabling, technical management and technical.

ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015 establish a common Information Management process as part of a framework for systems and software life-cycle processes, and identify, recommend or require a number of information items (documentation). ISO/IEC/IEEE 12207:2017 does not always specify when software information items are to be prepared, nor does it identify information item contents. This document is intended to be used in this context. IEEE contributed IEEE 12207.1-1997[1)] as a source for the first edition of this document.

1) *Guide for Information Technology — Software Life Cycle Processes — Life Cycle Data.*

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, as presented in Clause 10.

This document assumes an organization is performing life-cycle processes, or delivering system or software engineering services, using either or both of the following:

— ISO/IEC/IEEE 12207:2017 software life cycle processes;

— ISO/IEC/IEEE 15288:2015 system life cycle processes.

ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015 define an Information Management process, but do not "detail information items in terms of name, format, explicit content, and recording media" (ISO/IEC/IEEE 12207:2017, 1.4). These standards identify, recommend or require a number of documentation items. 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 engineering service management.

The generic document types defined in this document are used to identify the information necessary to support the processes required by ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015. The generic document types (which can be referred to as information item types) are used to identify the information necessary to support the 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 12207:2017 or ISO/IEC/IEEE 15288:2015. As ISO/IEC/IEEE 15288:2015, 1.4 points out, "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 and Clause 5.

This document is not a management system standard and does not establish a service management system, quality management system, or asset management system. 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 ISO/IEC/IEEE 26531 provides requirements for content management and component content management systems. ISO/IEC 26514 provides guidance on formats for user documentation (information for users).

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 engineering service management, such as business strategies, contract change notices (agreement change report), 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/IEEE 12207:2017 or ISO/IEC/IEEE 15288:2015 subclause, such as ISO/IEC/IEEE 12207:2017, 6.4.10.3 c) 3);

f) any ISO/IEC/IEEE 15288:2015 or ISO/IEC/IEEE 12207:2017 subclause not explicitly or implicitly identifying the recording of information about a process, activity or task, for example, ISO/IEC/IEEE 12207:2017, 6.2.4.3 c);

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.

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/IEEE 12207:2017, *Systems and software engineering — Software life cycle processes*

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

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

NOTE For additional terms and definitions in the field of systems and software engineering, see ISO/IEC/IEEE 24765, which is published periodically as a “snapshot” of the SEVOCAB (Systems and software Engineering Vocabulary) database and is publicly accessible at www.computer.org/sevocab.

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

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

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

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

3.1.1
approval
notification by an authorized representative that a deliverable item appears to satisfy requirements and is *complete* (3.1.3)

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 (3.1.21) of perceived non-compliance with a service level agreement or customer dissatisfaction with service

3.1.3
complete
<documentation> including all *critical information* (3.1.7) 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* (3.1.20) can be evaluated

3.1.7
critical information
information describing the safe use of the system, the security of the information created with the system, or the protection of the sensitive personal information created by or stored with the system

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 (3.1.12) 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* (3.1.22), *specification* (3.1.26), 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
include
<information> has either the information or a reference to the information

3.1.12
information item
information product
separately identifiable body of information that is produced, stored, and delivered for human use

Note 1 to entry: A *document* (3.1.10) produced to meet information requirements can be an information item, 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.

3.1.13
information item content
information included in an *information item* (3.1.12), associated with a system, product or service, to satisfy a requirement or need

3.1.14
information item type
generic document type
group of i*nformation items* (3.1.12) *consistent* (3.1.4) with a pre-arranged set of generic *criteria* (3.1.6)

EXAMPLE A "plan" is the information item type for all *plans* (3.1.16) and "report" is the information item type for all *reports* (3.1.22).

3.1.15
modifiable
structured and having a style such that changes can be made completely, consistently, and correctly while retaining the structure

3.1.16
plan
information item (3.1.12), that presents a systematic course of action for achieving a declared purpose, including when, how, and by whom specific activities are to be performed

3.1.17
policy
clear and measurable statement of preferred direction and behavior to condition the decisions made within an organization

3.1.18
presentable
retrievable and viewable

3.1.19
procedure
information item (3.1.12) that presents an ordered series of steps to perform a *process* (3.1.20), 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, procedures can be documented or not.

3.1.20
process
set of interrelated or interacting activities which transforms inputs into outputs

3.1.21
record
set of related data items treated as a unit

3.1.22
report
information item (3.1.12) that describes the results of activities such as investigations, observations, assessments, or tests

3.1.23
request
information item (3.1.12), that initiates a defined course of action or change to fulfil a need

3.1.24
service request
request (3.1.23) for information or for a routine change or *procedure* (3.1.19) with previously evaluated risk

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

3.1.25
software item
identifiable part of a software product

EXAMPLE Identification and *descriptions* (3.1.9) of the software product, source code, software life-cycle data, archive and release data, and instructions for building the executable object code.

3.1.26
specification
information item (3.1.12), that identifies, in a *complete* (3.1.3) precise, and *verifiable* (3.1.29) manner, the requirements, design, behavior, or other expected characteristics of a system, service, or *process* (3.1.20)

3.1.27
traceable
having components whose origin can be determined

3.1.28
unambiguous
described in terms that allow only a single interpretation, aided, if necessary, by a definition

3.1.29
verifiable
can be checked for correctness by a person or tool

3.2 Abbreviated terms

CFP	call for proposals
CM	configuration management
CONOPS	concept of operations
COOP	continuity of operations plan
ITT	invitation to tender
OPSCON	operational concept
RFP	request for proposal
SLA	service level agreement

4 Applicability

4.1 Purpose

The purpose of this document is to provide requirements for users of ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015 for identifying and planning the specific information items (information products) to be developed and revised during systems and software life cycles and service management. 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/IEEE 12207:2017 processes;

b) to specify information in an agreement process or two-party situation as described in ISO/IEC/IEEE 15288:2015 or ISO/IEC/IEEE 12207:2017. 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 12207:2017, 6.3.6 and ISO/IEC/IEEE 15288:2015, 6.3.6 during a system life cycle (including software systems);

b) project managers responsible for identifying information item requirements and document contents when using ISO/IEC/IEEE 12207:2017, 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/IEEE 12207:2017 or ISO/IEC/IEEE 15288:2015, and

f) individuals undertaking service, systems or software process improvement in their organizations.

4.3 Applicability to work efforts

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

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; and

d) documentation in Commercial-Off-The-Shelf (COTS) products when the COTS product is specified as a deliverable under a two-party situation.

4.4 Applicability to information item audiences

Users of this document should determine the relationship of the requirements in this document to the requirements and needs of their audience (customers or users of information), 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 document 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; and

c) to aid both users who are expected to understand technical concepts and terminology, and users who may not have this background.