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Systems and software engineering — Software life cycle processes —

Part 2: Relation and mapping between ISO/IEC/IEEE 12207:2017 and ISO/IEC 12207:2008

Ingénierie des systèmes et du logiciel — Processus du cycle de vie du logiciel —

Partie 2: Relation et correspondance entre l'ISO/IEC/IEEE 12207:2017 et l'ISO/IEC 12207:2008

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Foreword

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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).

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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 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.

A list of all parts in the ISO/IEC/IEEE 12207 series can be found on the ISO website.

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

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Introduction

The processes in ISO/IEC/IEEE 12207:2017 form a comprehensive set from which an organization can construct software system life cycle models appropriate to its products and services. An organization, depending on its purpose, can select and apply an appropriate subset to fulfil that purpose.

However, ISO/IEC/IEEE 12207:2017 does not include "software-specific processes" as a specialization of system processes, as identified in ISO/IEC 12207:2008, Clause 7. Those processes are partially represented as activities, tasks and NOTEs in processes defined in ISO/IEC/IEEE 12207:2017. This document supports software engineering users of ISO/IEC 12207:2008 in applying their current processes, activities and tasks based on the previous edition to perform effectively and efficiently processes, activities and tasks in ISO/IEC/IEEE 12207:2017. This document also intends to help system engineers using ISO/IEC/IEEE 12207:2017 (or ISO/IEC/IEEE 15288:2015) collaborate with software engineers who have used ISO/IEC 12207:2008.

This document can be used in one or more of the following modes in conjunction with ISO/IEC/IEEE 12207:

— By an organization — to help use the current organizational software processes and assets derived from ISO/IEC 12207:2008 in establishing an environment of desired processes of ISO/IEC/IEEE 12207:2017.

— By a project — to help use the current project's software processes and assets derived from ISO/IEC 12207:2008 and extend these to processes of ISO/IEC/IEEE 12207:2017 to provide software systems as products and services.

— By an acquirer and a supplier — to help use the current agreement concerning processes and activities derived from ISO/IEC 12207:2008 in establishing an environment of desired processes of ISO/IEC/IEEE 12207:2017.

— By process assessors — to serve as an aid to mapping tasks and activities of the previous edition of ISO/IEC 12207:2008 to the process reference model in ISO/IEC/IEEE 12207:2017, Annex C for process assessments that may be used to support organizational process improvement.

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Systems and software engineering — Software life cycle processes —

Part 2: Relation and mapping between ISO/IEC/IEEE 12207:2017 and ISO/IEC 12207:2008

1 Scope

This document provides the mapping expressing corresponding relations between software life cycle processes in ISO/IEC/IEEE 12207:2017 and the processes in ISO/IEC 12207:2008.

These relations are demonstrated by means of mapping tables that show relationships between activities and tasks, and process outcomes.

This mapping assists users of ISO/IEC 12207:2008 to transition to using ISO/IEC/IEEE 12207:2017.

This document will help users understand the differences between the reference processes and requirements of the two editions of ISO/IEC/IEEE 12207, and any potential gaps or process enhancements that can be needed in seeking conformance to and/or using ISO/IEC/IEEE 12207:2017. Also, this document provides to such users the mapping which helps to identify corresponding process outcomes, activities and tasks of processes for software systems in ISO/IEC/IEEE 12207:2017.

The mapping between ISO/IEC/IEEE 12207:2017 and ISO/IEC 12207:2008 in this document can be used as a basis to continuously conduct, improve and extend current process assets including software specific process assets based on ISO/IEC 12207:2008 for effective implementation of ISO/IEC/IEEE 12207:2017. These process activities and tasks can be applied iteratively.

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC/IEEE 12207:2017 apply.

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

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

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

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

NOTE Definitions for software engineering terms typically can be found in ISO/IEC/IEEE 24765, available at www.computer.org/sevocab.

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4 Purpose

Users should apply this document to map between their current software life cycle processes consistent with ISO/IEC 12207:2008 and the processes, activities, and tasks required by ISO/IEC/IEEE 12207:2017.

The user may define and document user implemented processes differently from either ISO/IEC 12207:2008 or ISO/IEC/IEEE 12207:2017. Then, the mapping tables of this document may be modified with additional user process information, when the user's processes are mapped to the reference processes of ISO/IEC/IEEE 12207:2017 in order to claim conformance with that standard.

This document will help users (who are presumably users of ISO/IEC 12207:2008 as well) to understand the similarities and differences between the reference process definitions and requirements contained in ISO/IEC 12207:2008 and ISO/IEC/IEEE 12207:2017 and then to help map their own implemented lifecycle processes to ISO/IEC/IEEE 12207:2017. Where ISO/IEC/IEEE 12207:2017 requirements (at the level of processes, outcomes, activities or tasks) differ from those in ISO/IEC 12207:2008, the user will be able to identify elements (again at the level of processes, activities or tasks) which have gaps or will not meet the requirements for conformance with ISO/IEC/IEEE 12207:2017.

Users can identify corresponding process outcomes, activities or tasks from the mapping tables in Clause 6.

This document has none of conformance requirements. However, process outcome or activity/task mapping of this document can be used to support conformance to ISO/IEC/IEEE 12207:2017. Such a case is stated in Clause 1.

NOTE 1 The mappings in this document expand on ISO/IEC/IEEE 12207:2017, Table I.1, "Comparison of processes in ISO/IEC/IEEE 12207:2017 and the previous edition", and ISO/IEC/IEEE 12207:2017, Table I.2, "Comparison of process outcomes in ISO/IEC/IEEE 12207:2017 and software-related outcomes in the previous edition".

NOTE 2 Analysis of the relationships between the tasks and activities of ISO/IEC 12207:2008 and ISO/IEC/IEEE 12207, as detailed in this document, can assist in process assessment and improvement. ISO/IEC 33004 can be used to develop a process reference model.

The following are typical use cases when users of this document can apply mappings:

— users can understand which processes, outcomes, activities, or tasks of ISO/IEC/IEEE 12207:2017 cover or subsume the outcomes, activities, or tasks of processes (including software specific processes) of ISO/IEC 12207:2008;

— users can identify outcomes, activities, or tasks of processes (including software specific processes) of ISO/IEC 12207:2008 that are to be continuously conducted, enhanced, extended or improved to meet the requirements of ISO/IEC/IEEE 12207:2017 and/or to demonstrate achievement of required outcomes, activities and tasks of the software life cycle processes.

5 Overview of the mappings

5.1 General

The process models used in ISO/IEC 12207:2008 and ISO/IEC 15288:2008 were harmonized to the process model used in both ISO/IEC/IEEE 12207:2017 and ISO/IEC/IEEE 15288:2015.

This document provides bi-directional mappings for outcomes, activities, and tasks between ISO/IEC 12207:2008 and ISO/IEC/IEEE 12207:2017.

This document contains the following tables:

— Clause 6 Outcome mappings

  — Mapping from ISO/IEC/IEEE 12207:2017 to ISO/IEC 12207:2008 (Table 1)

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  - Mapping from ISO/IEC 12207:2008 to ISO/IEC/IEEE 12207:2017 (Table 2)

- Clause 7 Activity and Task-level mappings
  - Mapping from ISO/IEC/IEEE 12207:2017 to ISO/IEC 12207:2008 (Table 3)
  - Mapping from ISO/IEC 12207:2008 to ISO/IEC/IEEE 12207:2017 (Table 4)

These tables can be used to determine how requirements in ISO/IEC 12207:2008 were treated or requirements in ISO/IEC/IEEE 12207:2017 have originated. Where a relationship is identified, it does not necessarily imply that the intent is identical.

This document provides a correspondence between ISO/IEC 12207:2008 and ISO/IEC/IEEE 12207:2017. It does not provide any explanatory commentary on why a change has been made, or the significance of the change.

NOTE Couplings of associative multiple outcomes or tasks are often mapped, rather than one-to-one mapping, from ISO/IEC 12207:2008 to ISO/IEC/IEEE 12207:2017.

5.2 Compound and singular requirements

A compound requirement is a requirement (i.e. 'shall') containing more than one obligation that needs to be satisfied. There are many instances in ISO/IEC 12207:2008 where the requirement is expressed as

'.. shall do this and do that and do the other'.

Although this may be a single sentence, it represents three separate obligations that will need to be satisfied.

Singular requirements are created from compound requirements by separating out these distinct requirements, when such a separated mapping helps to provide more obvious relations.

By way of example, the following sub-clause fragment is taken from ISO/IEC 12207:2008, 6.4.10.3.1.1, task 'Software Maintenance Process, Process implementation', "The maintainer shall develop, document, and execute plans and procedures for conducting the activities and tasks of the Software Maintenance Process."

Three singular requirements can be identified in this compound requirement:

- "6.4.10.3.1.1-1 The maintainer shall develop[, document, and execute] plans and procedures for conducting the activities and tasks of the Software Maintenance Process."
- "6.4.10.3.1.1-2 The maintainer shall [develop,] document[, and execute] plans and procedures for conducting the activities and tasks of the Software Maintenance Process."
- "6.4.10.3.1.1-3 The maintainer shall [develop, document, and] execute plans and procedures for conducting the activities and tasks of the Software Maintenance Process."

Square brackets (i.e. [ ]) are used to identify the particular requirement(s) to be ignored in reading the numbered compound requirements.

NOTE Additionally, 'should' and 'may' statements and descriptions in NOTEs are used to make mapping, when they are helpful for user to understand reasons for correspondences.

6 Outcome mappings

6.1 Outcome mapping from ISO/IEC/IEEE 12207:2017 to ISO/IEC 12207:2008

Table 1 correlates process outcomes required by ISO/IEC/IEEE 12207:2017 to process outcomes required in ISO/IEC 12207:2008. The mapping indicates related outcomes that may be helpful in meeting

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the requirements of ISO/IEC/IEEE 12207:2017. There is no assumption that all the required outcomes of ISO/IEC 12207:2008 are required to fulfil the required outcomes of ISO/IEC/IEEE 12207:2017.

When the subclause is indicated by 'l.m.n.2 x)', it indicates the process outcome x) that is described in the subclause for outcome 'l.m.n.2' of process 'l.m.n' in ISO/IEC/IEEE 12207:2017 and ISO/IEC 12207:2008 respectively.

NOTE An only process outcome with asterisk marking, i.e. ' (*) ', has a discrepancy mapping between the one in ISO/IEC/IEEE 12207:2017, Table I.2 to provide the more obvious relation, though this is extension of ISO/IEC/IEEE 12207:2017, Table I.2.

Table 1 — Outcome mapping from ISO/IEC/IEEE 12207:2017 to ISO/IEC 12207:2008

Outcomes (ISO/IEC/IEEE 12207:2017)	Sub clause	Sub clause	**Outcomes (ISO/IEC 12207:2008)**
6.1.1 Acquisition process			
Acquisition 2. a) A request for supply is prepared.	6.1.1.2a)	6.1.1.2a)	**Acquisition** 2. a) acquisition needs, goals, product and/or service acceptance criteria and acquisition strategies are defined;
Acquisition 2. b) One or more suppliers are selected.	6.1.1.2b)	6.1.1.2c)	**Acquisition** 2. c) one or more suppliers is selected;
Acquisition 2. c) An agreement is established between the acquirer and supplier.	6.1.1.2c)	6.1.1.2b)	**Acquisition** 2. b) an agreement is developed that clearly expresses the expectation, responsibilities and liabilities of both the acquirer and the supplier;
Acquisition 2. d) A product or service complying with the agreement is accepted.	6.1.1.2d)	6.1.1.2d)	**Acquisition** 2. d) a product and/or service is acquired that satisfies the acquirer's stated need;
	6.1.1.2d)	6.1.1.2e)	**Acquisition** 2. e) the acquisition is monitored so that specified constraints such as cost, schedule and quality are met;
	6.1.1.2d)	6.1.1.2f)	**Acquisition** 2. f) supplier deliverables are accepted;
Acquisition 2. e) Acquirer obligations defined in the agreement are satisfied.	6.1.1.2e)	6.1.1.2g)	**Acquisition** 2. g) any identified open items have a satisfactory conclusion as agreed to by the acquirer and the supplier.
6.1.2 Supply process			
Supply 2. a) An acquirer for a product or service is identified.	6.1.2.2a)	6.1.2.2a)	**Supply** 2. a) an acquirer for a product or service is identified;
Supply 2. b) A response to the acquirer's request is produced.	6.1.2.2b)	6.1.2.2b)	**Supply** 2. b) a response to an acquirer's request is produced;
Supply 2. c) An agreement is established between the acquirer and supplier.	6.1.2.2c)	6.1.2.2c)	**Supply** 2. c) an agreement is established between the acquirer and the supplier for developing, maintaining, operating, packaging, delivering, and installing the product and/or service;
Supply 2. d) A product or service is provided.	6.1.2.2d)	6.1.2.2d)	**Supply** 2. d) a product and/or service that meets the agreed requirements are developed by the supplier;
Supply 2. e) Supplier obligations defined in the agreement are satisfied.	6.1.2.2e)	6.1.2.2e)	**Supply** 2. e) the product and/or service is delivered to the acquirer in accordance with the agreed requirements;
Supply 2. f) Responsibility for the acquired product or service, as directed by the agreement, is transferred.	6.1.2.2f)	6.1.2.2f)	**Supply** 2. f) the product is installed in accordance with the agreed requirements.

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Table 1 *(continued)*

Outcomes (ISO/IEC/IEEE 12207:2017)	Sub clause	Sub clause	Outcomes (ISO/IEC 12207:2008)
6.2.1 Life cycle model Management process			
Life cycle model management 2. a) Organizational policies and procedures for the management and deployment of life cycle models and processes are established.	6.2.1.2a)	6.2.1.2a)	**Life Cycle Model Management** 2. a) policies and procedures for the management and deployment of life cycle models and processes are provided;
Life cycle model management 2. b) Responsibility, accountability, and authority within life cycle policies, processes, models, and procedures are defined.	6.2.1.2b)	6.2.1.2b)	**Life Cycle Model Management** 2. b) responsibility, accountability and authority for life cycle management are defined;
Life cycle model management 2. c) Life cycle models and processes for use by the organization are assessed.	6.2.1.2c)	6.2.1.2c)	**Life Cycle Model Management** 2. c) life cycle processes, models and procedures for use by the organization are defined, maintained and improved;
Life cycle model management 2. d) Prioritized process, model, and procedure improvements are implemented.	6.2.1.2d)	6.2.1.2d)	**Life Cycle Model Management** 2. d) prioritized process improvements are implemented.
6.2.2 Infrastructure Management process			
Infrastructure Management 2. a) The requirements for infrastructure are defined.	6.2.2.2a)	6.2.2.2a)	**Infrastructure Management** 2. a) the requirements for infrastructure to support processes are defined;
Infrastructure Management 2. b) The infrastructure elements are identified and specified.	6.2.2.2b)	6.2.2.2b)	**Infrastructure Management** 2. b) the infrastructure elements are identified and specified;
Infrastructure Management 2. c) Infrastructure elements are developed or acquired.	6.2.2.2c)	6.2.2.2c)	**Infrastructure Management** 2. c) the infrastructure elements are acquired;
	6.2.2.2c)	6.2.2.2d)	**Infrastructure Management** 2. d) the infrastructure elements are implemented;
Infrastructure Management 2. d) The infrastructure is available.	6.2.2.2d)	6.2.2.2e)	**Infrastructure Management** 2. e) a stable and reliable infrastructure is maintained and improved.
6.2.3 Portfolio Management process			
Portfolio Management 2.a) Business venture opportunities, investments or necessities are qualified and prioritized.	6.2.3.2a)	6.2.3.2a)	**Project Portfolio Management** 2. a) business venture opportunities, investments or necessities are qualified, prioritized and selected;
Portfolio Management 2. b) Projects are identified.	6.2.3.2b)	6.3.1.2a)	**Project Planning** 2. a) the scope of the work for the project is defined;
Portfolio Management 2. c) Resources and budgets for each project are allocated.	6.2.3.2c)	6.2.3.2b)	**Project Portfolio Management** 2. b) resources and budgets for each project are identified and allocated;
Portfolio Management 2. d) Project management responsibilities, accountability, and authorities are defined.	6.2.3.2d)	6.2.3.2c)	**Project Portfolio Management** 2. c) project management accountability and authorities are defined;
Portfolio Management 2. e) Projects meeting agreement and stakeholder requirements are sustained.	6.2.3.2e)	6.2.3.2d)	**Project Portfolio Management** 2. d) projects meeting agreement and stakeholder requirements are sustained;

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Table 1 *(continued)*

Outcomes (ISO/IEC/IEEE 12207:2017)	Sub clause	Sub clause	Outcomes (ISO/IEC 12207:2008)
Portfolio Management 2. f) Projects not meeting agreement or satisfying stakeholder requirements are redirected or terminated.	6.2.3.2f)	6.2.3.2e)	**Project Portfolio Management** 2. e) projects not meeting agreement or stakeholder requirements are redirected or terminated;
Portfolio Management 2. g) Projects that have completed agreements and satisfied stakeholder requirements are closed.	6.2.3.2g)	None	None of outcomes is mapped.
6.2.4 Human Resource Management process			
Human Resource Management 2. a) Skills required by projects are identified.	6.2.4.2a)	6.2.4.2a)	**Human Resource Management** 2. a) skills required by projects are identified;
Human Resource Management 2. b) Necessary human resources are provided to projects.	6.2.4.2b)	6.2.4.2b)	**Human Resource Management** 2. b) necessary human resources are provided to projects;
Human Resource Management 2. c) Skills of personnel are developed, maintained or enhanced.	6.2.4.2c)	6.2.4.2c)	**Human Resource Management** 2. c) skills of personnel are developed, maintained or enhanced;
	6.2.4.2c)	6.2.4.2e)	**Human Resource Management** 2. e) individual knowledge, information and skills are collected, shared, reused and improved throughout the organization.
Human Resource Management 2. d) Conflicts in multi-project resource demands are resolved.	6.2.4.2d)	6.2.4.2d)	**Human Resource Management** 2. d) conflicts in multi-project resource demands are resolved;
6.2.5 Quality Management process			
Quality Management 2. a) Organizational quality management policies, objectives, and procedures are defined and implemented.	6.2.5.2a)	6.2.5.2a)	**Quality Management** 2. a) organization quality management policies and procedures are defined;
	6.2.5.2a)	6.2.5.2b)	**Quality Management** 2. b) organization quality objectives are defined;
	6.2.5.2a)	6.2.5.2c)	**Quality Management** 2. c) accountability and authority for quality management are defined;
Quality Management 2. b) Quality evaluation criteria and methods are established.	6.2.5.2b)	6.2.5.2a)	**Quality Management** 2. a) organization quality management policies and procedures are defined;
Quality Management 2. c) Resources and information are provided to projects to support the operation and monitoring of project quality assurance activities.	6.2.5.2c)	6.2.4.2b)	**Human Resource Management** 2. b) necessary human resources are provided to projects;
Quality Management 2. d) Quality assurance evaluation results are gathered and analyzed.	6.2.5.2d)	6.2.5.2d)	**Quality Management** 2. d) the status of customer satisfaction is monitored;
Quality Management 2. e) Quality management policies and procedures are improved based upon project and organizational results.	6.2.5.2e)	6.2.5.2e)	**Quality Management** 2. e) appropriate action is taken when quality objectives are not achieved.

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Table 1 *(continued)*

Outcomes (ISO/IEC/IEEE 12207:2017)	Sub clause	Sub clause	Outcomes (ISO/IEC 12207:2008)
6.2.6 Knowledge Management process			
Knowledge Management 2. a) A taxonomy for the application of knowledge assets is identified.	6.2.6.2a)	7.3.2.2a)	**Reuse Asset Management** 2. a) an asset management strategy is documented;
	6.2.6.2a)	7.3.2.2b)	**Reuse Asset Management** 2. b) an asset classification scheme is established;
	6.2.6.2a)	7.3.1.2a)	**Domain Engineering** 2. a) the representation forms for the domain models and the domain architectures are selected;
	6.2.6.2a)	7.3.1.2b)	**Domain Engineering** 2. b) the boundaries of the domain and its relationships to other domains are established;
	6.2.6.2a)	7.3.1.2c)	**Domain Engineering** 2. c) a domain model that captures the essential common and different features, capabilities, concepts, and functions in the domain is developed;
	6.2.6.2a)	7.3.1.2d)	**Domain Engineering** 2. d) a domain architecture describing the family of systems within the domain, including their commonalities and variabilities is developed;
	6.2.6.2a)	7.3.3.2a)	**Reuse Program Management** 2. a) the organization's reuse strategy, including its purpose, scope, goals and objectives, is defined;
	6.2.6.2a)	7.3.3.2b)	**Reuse Program Management** 2. b) the domains for potential reuse opportunities are identified;
Knowledge Management 2. b) The organizational knowledge, skills, and knowledge assets are developed or acquired.	6.2.6.2b)	6.2.4.2c)	**Human Resource Management** 2. c) skills of personnel are developed, maintained or enhanced;
	6.2.6.2b)	7.3.1.2e)	**Domain Engineering** 2. e) assets belonging to the domain are specified;
	6.2.6.2b)	7.3.1.2f)	**Domain Engineering** 2. f) assets belonging to the domain are acquired or developed and maintained throughout their life cycles;
	6.2.6.2b)	7.3.2.2c)	**Reuse Asset Management** 2. c) Criteria for asset acceptance, certification and retirement are defined;
	6.2.6.2b)	7.3.3.2c)	**Reuse Program Management** 2. c) the organization's systematic reuse capability is assessed;
	6.2.6.2b)	7.3.3.2d)	**Reuse Program Management** 2. d) the reuse potential of each domain is assessed;
	6.2.6.2b)	7.3.3.2e)	**Reuse Program Management** 2. e) reuse proposals are evaluated to ensure the reuse product is suitable for the proposed application;

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