TECHNICAL SPECIFICATION

ISO/IEC TS 33053

First edition
2019-11

Information technology — Process assessment — Process Reference Model (PRM) for quality management

Technologies de l'information — Évaluation du processus — Modèle de référence de processus pour la gestion de la qualité

Reference number
ISO/IEC TS 33053:2019(E)

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Published in Switzerland

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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 document should be noted. This document was drafted in accordance with the editorial rules of 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, *Systems and Software Engineering*.

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.

Introduction

The purpose of this document is to facilitate the development of a process assessment model described in ISO/IEC TS 33073.

ISO/IEC 33002 describes the requirements for the conduct of an assessment. ISO/IEC 33004 describes the requirements for process reference, process assessment and maturity models. ISO/IEC 33020 describes the measurement scale for assessing the process quality characteristic of process capability. ISO/IEC 33001 describes the concepts and terminology used for process assessment.

A process reference model is a model comprising definitions of processes described in terms of process purpose and outcomes, together with an architecture describing the relationships between the processes. Using the process reference model in a practical application can require additional elements suited to the environment and circumstances.

The process reference model specified in this document describes the processes including the quality management system processes implied by ISO 9001. Each process of this process reference model is described in terms of a purpose and outcomes, and provides traceability to requirements. The process reference model does not attempt to place the processes in any specific environment nor does it pre-determine any level of process capability required to fulfil the ISO 9001 requirements. The process reference model is not intended to be used for a conformity assessment audit or as a process implementation reference guide.

The relationships between ISO 9001, ISO/IEC TR 24774, ISO/IEC 33002, ISO/IEC 33004, ISO/IEC 33020, ISO/IEC TS 33053 and ISO/IEC TS 33073 are shown in Figure 1.

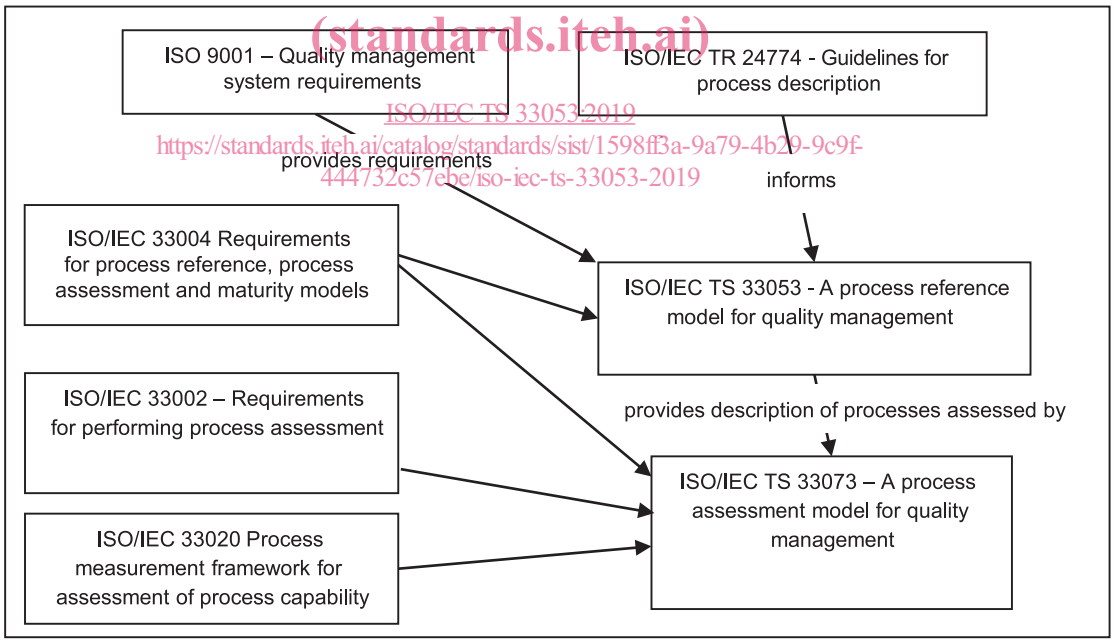

Figure 1 — Relationships between relevant standards

Any organization can define processes with additional elements in order to suit it to its specific environment and circumstances. Some processes cover general management aspects of an organization. These processes have been identified in order to give coverage to the requirements of ISO 9001.

The process reference model does not provide the evidence required by ISO 9001. The process reference model does not specify the interfaces between the processes.

This document describes a process reference model for quality management with descriptions of processes in Clause 5. Annex A describes the relationship between management system requirements

and process model elements. Annex B provides the statement of conformity in accordance with ISO/IEC 33004.

Information technology — Process assessment — Process Reference Model (PRM) for quality management

1 Scope

This document defines a process reference model for the domain of quality management.

The model specifies a process architecture for the domain and comprises a set of processes. Each process is described in terms of process purpose and outcomes.

NOTE Users of this document can freely reproduce the detailed descriptions contained in this process reference model as part of any tool or other material to support the performance of process assessments, so that it can be used for its intended purpose.

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 33001, *Information technology — Process assessment — Concepts and terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 33001 apply.

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

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

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

4 Overview of the process reference model

This clause describes the structure of a process reference model to support quality management. The process reference model includes processes, which can already exist in the context of a quality management system of a service provider.

Figure 2 identifies the processes derived from ISO 9001 requirements. Three process groups are identified, namely, common processes, technical processes and organizational processes. The term "common processes" refers to those processes identified with the text in the management system subclauses that is common to all management system standards. The term "technical processes" refers to processes associated with the technical domain of the application standard. In the present case of ISO 9001, the technical processes underpin the implementation of those requirements associated with the creation or support of products and services. "organizational processes" refers to those processes that support the implementation of the requirements for products and services.

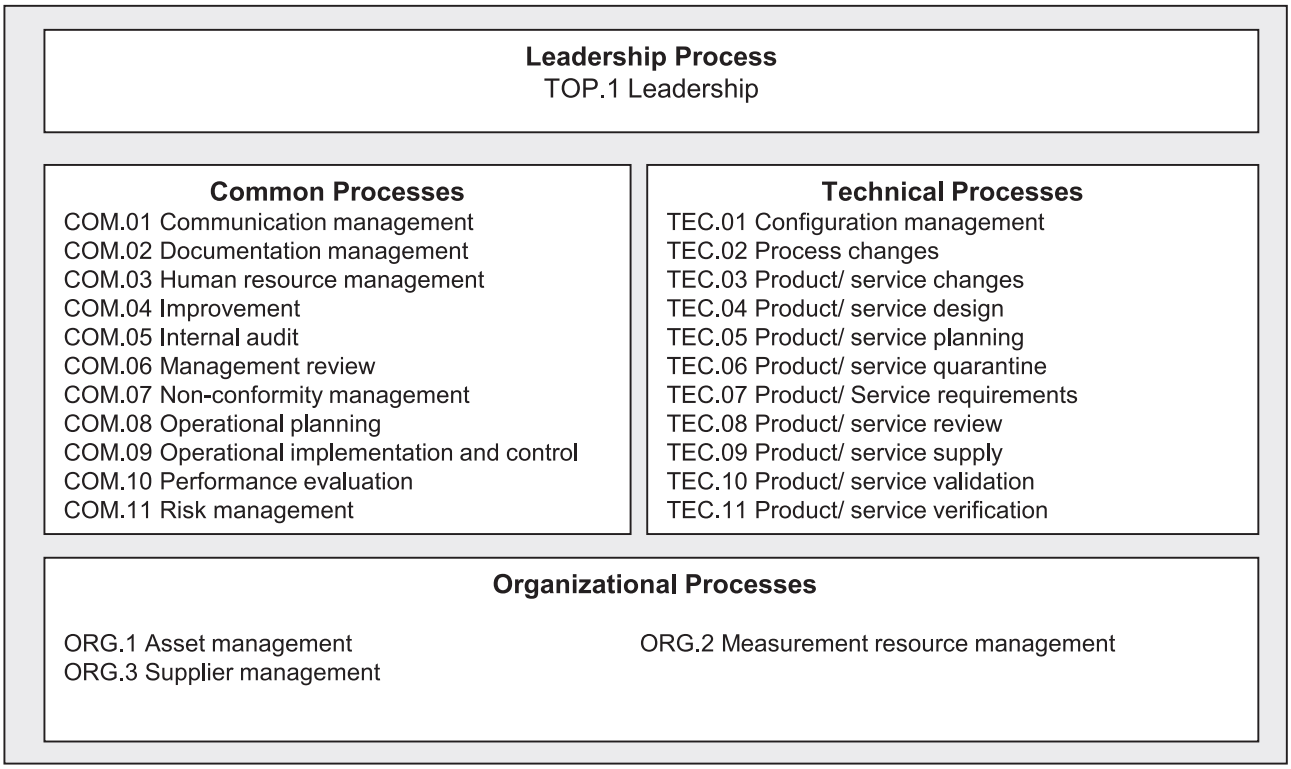

Figure 2 — Processes in the process reference model

5 Process descriptions

5.1 General

The process descriptions in this process reference model are defined following the guidance set out in ISO/IEC TR 24774. Each process in the process reference model has the following descriptive elements.

a) Process ID: each process belonging to a group is identified with a process identifier (ID) consisting of the group abbreviated name and a sequential number of the process in that group.

b) Name: the name of a process is a short phrase that summarizes the scope of the process, identifying the principal concern of the process, and distinguishes it from other processes within the scope of the process reference model.

c) Purpose: the purpose of the process is a high level, overall goal for performing the process.

d) Outcomes: an outcome is an observable result of the successful achievement of the process purpose. Outcomes are measurable, tangible, technical or business results that are achieved by a process. Outcomes are observable and assessable.

e) Requirements traceability: the outcomes are based on the requirements of ISO 9001. The references identify the applicable subclauses of ISO 9001, the subclause heading, and the outcomes that are supported.

In 5.2 to 5.27, all entries in the requirements traceability row end with numbers in square brackets, (i.e. [n]). Each number in the square brackets is a reference to a numbered outcome. These outcomes are directly linked to the requirements of ISO 9001.

Some outcomes are shown in square brackets. These are only indirectly linked to requirements of ISO 9001. The outcomes in square brackets are not referenced by any of the entries in the requirements traceability row. These additional outcomes have been included because they are considered necessary

in order for this type of process reference model to serve as the basis of the process assessment model (ISO/IEC TS 33073). With these additional outcomes, the process is complete and the process purpose can be achieved.

5.2 COM.01 Communication management

Process ID	COM.01
Name	Communication management
Purpose	The purpose of communication management is to produce timely and accurate information products to support effective communication and decision making.
Outcomes	As a result of successful implementation of this process: [1) Information content is defined in terms of identified communication requirements.] 2) Parties to communicate with are identified. 3) The party responsible for the communication is identified. 4) Events that require communication actions are identified. 5) The channel for the communication is selected. 6) Information products are communicated to relevant interested parties.
Requirements traceability	ISO 9001:2015, 5.1.1, General [6] ISO 9001:2015, 5.2.2, Communicating the quality policy [6] ISO 9001:2015, 7.4, Communication [2][3][4][5] ISO 9001:2015, 8.2.4, Changes to requirements for products and services [6] ISO 9001:2015, 8.4.3, Information for external providers [6] ISO 9001:2015, 8.7.1 [6] ISO 9001:2015, 9.2.2 [6]

5.3 COM.02 Documentation management

Process ID	COM.02
Name	Documentation management
Purpose	The purpose of document management is to provide relevant, timely, complete, valid documented information to designated parties.
Outcomes	As a result of successful implementation of this process: 1) Documented information to be documented is identified. 2) The forms of documented information representation are defined. 3) The documented information content status is known. 4) Documented information is current, complete and valid. 5) Documented information is released according to defined criteria. 6) Documented information is available to relevant interested parties. 7) Documented information is archived, or disposed of, as required.

Requirements traceability	ISO 9001:2015, 4.3, Determining the scope of the quality management system [1][3] ISO 9001:2015, 5.2.2, Communicating the quality policy [1][4][6] ISO 9001:2015, 6.2.1 [3][4] ISO 9001:2015, 7.1.5.1, General [1] ISO 9001:2015, 7.1.6, Organizational knowledge [4][6] ISO 9001:2015, 7.2, Competence [1] ISO 9001:2015, 7.5.2, Creating and updating [2][5] ISO 9001:2015, 7.5.3.1 [4][6] ISO 9001:2015, 7.5.3.2 [2][4][6][7] ISO 9001:2015, 8.1, Operational planning and control [1] ISO 9001:2015, 8.2.3.2 [1] ISO 9001:2015, 8.2.4, Changes to requirements for products and services [3][4] ISO 9001:2015, 8.3.2, Design and development planning [1] ISO 9001:2015, 8.3.3, Design and development inputs [1] ISO 9001:2015, 8.3.4, Design and development controls [1] ISO 9001:2015, 8.3.5, Design and development outputs [1] ISO 9001:2015, 8.3.6, Design and development changes [1] ISO 9001:2015, 8.4.1, General [1] ISO 9001:2015, 8.5.1, Control of production and service provision [1] ISO 9001:2015, 8.5.2, Identification and traceability [1] ISO 9001:2015, 8.5.3, Property belonging to customers or external providers [1] ISO 9001:2015, 8.5.6, Control of changes [1] ISO 9001:2015, 8.6, Release of products and services [5] ISO 9001:2015, 8.7.2 [1] ISO 9001:2015, 9.1.1, General [1] ISO 9001:2015, 9.2.2 [1] ISO 9001:2015, 9.3.3, Management review outputs [1] ISO 9001:2015, 10.2.2 [1]

5.4 COM.03 Human resource management

Process ID	COM.03
Name	Human resource management
Purpose	The purpose of human resource management is to provide the organization with necessary competent human resources and to improve their competencies, in alignment with business needs.
Outcomes	As a result of successful implementation of this process: 1) The competencies required by the organization to produce products and services are identified. 2) Identified competency gaps are filled through training or recruitment. 3) Understanding of roles and activities in achieving organisational objectives in product and service provision is demonstrated by each person.

Requirements traceability	ISO 9001:2015, 7.2, Competence [1][2] ISO 9001:2015, 7.3, Awareness [3]

5.5 COM.04 Improvement

Process ID	COM.04
Name	Improvement
Purpose	The purpose of improvement is to continually improve the management system, its processes, products and services.
Outcomes	As a result of successful implementation of this process: 1) Opportunities for improvement are identified. 2) Opportunities for improvement are evaluated against defined criteria. [3) Improvements are prioritized.] [4) Improvements are implemented.] [5) The effectiveness of implemented improvements is evaluated.]
Requirements traceability	ISO 9001:2015, 9.1.3, Analysis and evaluation [2] ISO 9001:2015, 9.3.3, Management review outputs [1] ISO 9001:2015, 10.1, General [1] ISO 9001:2015, 10.3, Continual improvement [1]

5.6 COM.05 Internal audit

Process ID	COM.05
Name	Internal audit
Purpose	The purpose of internal audit is to independently determine conformity of the management system, products, services, and processes to the requirements, policies, plans and agreements, as appropriate.
Outcomes	As a result of successful implementation of this process: 1) The scope and purpose of each audit is defined. 2) The objectivity and impartiality of the conduct of audits and selection of auditors are assured. 3) Conformity of selected services, products and processes with requirements, plans and agreements is determined.
Requirements traceability	ISO 9001:2015, 9.2.1 [3] ISO 9001:2015, 9.2.2 [1][2][3]

5.7 COM.06 Management review

Process ID	COM.06
Name	Management review
Purpose	The purpose of management review is to assess the performance of the management system, to identify and make decisions regarding potential improvements.
Outcomes	As a result of successful implementation of this process: 1) The objectives of the review are established. 2) The status and performance of an activity or process are assessed in terms of the established objectives. 3) Risks, problems and opportunities for improvement are identified.
Requirements traceability	ISO 9001:2015, 9.3.1, General [2] ISO 9001:2015, 9.3.2, Management review inputs [1] ISO 9001:2015, 9.3.3, Management review outputs [3]

5.8 COM.07 Non-conformity management

Process ID	COM.07
Name	Non-conformity management
Purpose	The purpose of the non-conformity management process is to resolve non-conformities and to eliminate their causes when appropriate.
Outcomes	As a result of successful implementation of this process: 1) Non-conformities are identified. 2) Non-conformities are resolved and closed. 3) The cause(s) of selected non-conformities is determined. 4) The need for action to eliminate the causes of non-conformities is evaluated. 5) A selected action proposal is implemented. 6) The effectiveness of changes to eliminate the non-conformities is confirmed.
Requirements traceability	ISO 9001:2015, 7.1.5.2, Measurement traceability [1] ISO 9001:2015, 7.4, Communication [5] ISO 9001:2015, 9.2.2 [1] ISO 9001:2015, 10.2.1 [1][2][3][4][5][6]

5.9 COM.08 Operational planning

Process ID	COM.08
Name	Operational planning
Purpose	The purpose of operational planning is to define the characteristics of all operational and organizational processes, and to plan their execution.

Outcomes	As a result of successful implementation of this process: 1) Process requirements are identified. 2) Process input and output products are determined. 3) The set of activities that transform the inputs into outputs is determined. 4) The sequence and interaction of the process with other processes is determined. 5) The required competencies and roles for performing the process are identified. 6) The required resources for performing the process are identified. 7) Methods for monitoring the effectiveness and suitability of the process are determined. 8) Plans for the deployment of the process are developed.
Requirements traceability	ISO 9001:2015, 4.4.1, [2][4][5][6][7] ISO 9001:2015, 5.2.1, Establishing the quality policy [1] ISO 9001:2015, 5.3, Organizational roles, responsibilities and authorities [5] ISO 9001:2015, 6.1.1 [1][8] ISO 9001:2015, 6.1.2 [8] ISO 9001:2015, 6.2.2 [1][5][6][7][8] ISO 9001:2015, 6.3, Planning of changes [1] ISO 9001:2015, 7.1.1, General [6] ISO 9001:2015, 7.1.3, Infrastructure [1] ISO 9001:2015, 7.1.4, Environment for the operation of processes [1] ISO 9001:2015, 7.1.5.1, General [1] ISO 9001:2015, 7.5.2, Creating and updating [1] ISO 9001:2015, 8.1, Operational planning and control [1][2][4][6] ISO 9001:2015, 8.2.1, Customer communication [1] ISO 9001:2015, 8.3.2, Design and development planning [8] ISO 9001:2015, 8.3.4, Design and development controls [1] ISO 9001:2015, 8.5.1, Control of production and service provision [3][4][5][6][7] ISO 9001:2015, 9.1.1, General [8] ISO 9001:2015, 9.2.1 [8] ISO 9001:2015, 9.2.2 [8] ISO 9001:2015, 9.3.1, General [8] ISO 9001:2015, 9.3.2, Management review inputs [8]

5.10 COM.09 Operational implementation and control

Process ID	COM.09
Name	Operational implementation and control
Purpose	The purpose of the operational implementation and control process is to deploy and control the execution and performance of operational and organizational processes.

Outcomes	As a result of successful implementation of this process: 1) The required roles, responsibilities and authorities are allocated. 2) The required resources are allocated and applied. 3) Actions required to achieve the management system objectives are implemented. 4) Suitability and effectiveness of the actions taken to achieve the management system objectives are reviewed. 5) Deviations from planned arrangements are corrected when targets are not achieved. 6) Data is collected and analysed as a basis for understanding the behaviour of, and to demonstrate the suitability and effectiveness of the processes.
Requirements traceability	ISO 9001:2015, 4.1, Understanding the organization and its context [4] ISO 9001:2015, 4.2, Understanding the needs and expectations of interested parties [4] ISO 9001:2015, 5.2.1, Establishing the quality policy [3][4] ISO 9001:2015, 5.3, Organizational roles, responsibilities and authorities [1] ISO 9001:2015, 7.1.1, General [2] ISO 9001:2015, 7.1.2, People [2] ISO 9001:2015, 7.1.3, Infrastructure [3] ISO 9001:2015, 7.1.4, Environment for the operation of processes [3][4] ISO 9001:2015, 7.1.5.1, General [2][3] ISO 9001:2015, 7.2, Competence [4] ISO 9001:2015, 8.1, Operational planning and control [3][4][5] ISO 9001:2015, 8.2.3.1 [4] ISO 9001:2015, 8.4.3, Information for external providers [4] ISO 9001:2015, 8.5.1, Control of production and service provision [3] ISO 9001:2015, 9.1.3, Analysis and evaluation [6] ISO 9001:2015, 9.2.2 [3][4]

5.11 COM.10 Performance evaluation

Process ID	COM.10
Name	Performance evaluation
Purpose	The purpose of performance evaluation is to collect and analyse data that will be used to evaluate the performance of the management system and the business processes in terms of the defined objectives.
Outcomes	As a result of successful implementation of this process: 1) Performance monitoring and measurement needs are defined. [2) Performance measures, derived from the performance measurement needs, are identified.] 3) Performance measurement methods, supportive of the performance measures, are identified. 4) Data is collected using the identified performance measurement methods. 5) The collected performance data is analysed.

Requirements traceability	ISO 9001:2015, 9.1.1, General [1][3][4] ISO 9001:2015, 9.1.2, Customer satisfaction [1][3] ISO 9001:2015, 9.1.3, Analysis and evaluation [5]

5.12 COM.11 Risk management

Process ID	COM.11
Name	Risk management
Purpose	The purpose of risk management is to identify, analyse, evaluate, treat and monitor risks.
Outcomes	As a result of successful implementation of this process: [1) Criteria for the assessment of risks and the acceptable level of risk are identified.] 2) Risks are identified. [3) Identified risks are analysed.] [4) Risks are evaluated against defined criteria.] [5) Risks are selected for treatment.] 6) Selected risks are treated.
Requirements traceability	ISO 9001:2015, 6.1.2 [6] ISO 9001:2015, 10.2.1 [2]

5.13 ORG.01 Asset management

Process ID	ORG.01
Name	Asset management
Purpose	The purpose of the asset management process is to establish and maintain the integrity of all identified product assets.
Outcomes	As a result of successful implementation of this process: 1) Items requiring asset management are identified. 2) Asset status is known. [3) Changes to assets under management are controlled.] 4) The integrity of assets is assured.
Requirements traceability	ISO 9001:2015, 8.5.3, Property belonging to customers or external providers [1][2][4]

5.14 ORG.02 Measurement resource management

Process ID	ORG.02
Name	Measurement resource management
Purpose	The purpose of the measurement resource management process is to ensure that measurement resources used to perform tests and calibrations is acquired, controlled and maintained.