
**Software engineering — Process
assessment —**

**Part 2:
Performing an assessment**

*Génie logiciel — Procédés d'évaluation —
Partie 2: Exécution d'une évaluation*
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ISO/IEC 15504-2:2003

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Contents

Page

Foreword.....	iv
Introduction	iv
1 Scope.....	1
2 Normative references	1
3 Terms and definitions.....	2
4 Performing an assessment.....	2
4.1 General	2
4.2 The assessment process	2
4.3 Roles and responsibilities.....	4
4.4 Defining the initial assessment input	4
4.5 Recording the assessment output.....	6
5 Measurement framework for process capability	6
5.1 Level 0: Incomplete process.....	6
5.2 Level 1: Performed process.....	6
5.3 Level 2: Managed process.....	7
5.4 Level 3: Established process.....	8
5.5 Level 4: Predictable process.....	9
5.6 Level 5: Optimizing process.....	9
5.7 Rating process attributes.....	10
5.8 Process capability level model.....	11
6 Models for process assessment.....	11
6.1 Introduction	11
6.2 Process Reference Models	12
6.3 Process Assessment Models	13
7 Mechanisms for verification of conformity	15
7.1 Introduction	15
7.2 Verifying conformity of Process Reference Models.....	16
7.3 Verifying conformity of Process Assessment Models.....	16
7.4 Verifying conformity of process assessments	16

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.

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

The main task of the joint technical committee 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.

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.

ISO/IEC 15504-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and system engineering*.

This first edition of ISO/IEC 15504-2 cancels and replaces ISO/IEC TR 15504-2:1998 and ISO/IEC TR 15504-3:1998, which have been technically revised.

ISO/IEC 15504 consists of the following parts, under the general title *Software engineering — Process assessment*:

- *Part 2: Performing an assessment*
- *Part 3: Guidance on performing an assessment*
- *Part 4: Guidance on use for process improvement and process capability determination*

The following parts are in preparation:

- *Part 1: Concepts and vocabulary*
- *Part 5: An exemplar Process Assessment Model*

The complete series will replace ISO/IEC TR 15504-1 to ISO/IEC TR 15504-9.

Introduction

This part of ISO/IEC 15504 defines the basis for process assessment. Other parts of ISO/IEC 15504 contain guidance that will provide a more detailed understanding of the subject. It is primarily addressed to the competent assessor and other stakeholders, such as the sponsor of the assessment, who need to be assured that the requirements of this International Standard have been met. It will also be of value to developers of assessment methods and of tools to support an assessment.

ISO/IEC 15504-2 sets out the minimum requirements for performing an assessment that ensure consistency and repeatability of the ratings. The requirements help to ensure that the assessment output is self-consistent and provides evidence to substantiate the ratings and to verify compliance with the requirements.

ISO/IEC 15504-1 provides a general introduction to the concepts of process assessment and a glossary for assessment related terms.

ISO/IEC 15504-3 provides guidance for interpreting the requirements for performing an assessment.

This part of ISO/IEC 15504 identifies the measurement framework for process capability and the requirements for:

- a) performing an assessment;
- b) Process Reference Models;
- c) Process Assessment Models;
- d) verifying conformity of process assessment.

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Process assessment, as defined in this International Standard, is based on a two dimensional model containing a process dimension and a capability dimension. The process dimension is provided by an external Process Reference Model, which defines a set of processes characterized by statements of process purpose and process outcomes. The capability dimension consists of a measurement framework comprising six process capability levels and their associated process attributes.

The assessment output consists of a set of process attribute ratings for each process assessed, termed the process profile, and may also include the capability level achieved by that process.

Process assessment is applicable in the following circumstances:

- a) by or on behalf of an organization with the objective of understanding the state of its own processes for process improvement;
- b) by or on behalf of an organization with the objective of determining the suitability of its own processes for a particular requirement or class of requirements;
- c) by or on behalf of one organization with the objective of determining the suitability of another organization's processes for a particular contract or class of contracts.

As described in ISO/IEC 15504-4, process assessment is an activity that can be performed either as part of a process improvement initiative or as part of a capability determination approach. The formal entry to the assessment process occurs with the compilation of the assessment input which defines the purpose of the assessment (why it is being carried out), the scope of the assessment, what constraints apply to the assessment and any additional information that needs to be gathered. The assessment input also defines the responsibility of the various parties in the performance of an assessment. An assessor who has the necessary

competence and skills oversees the assessment. Assessors may be from within the organization, external to the organization or a combination of both.

An assessment is carried out against a defined assessment input utilizing conformant Process Assessment Model(s) related to one or more conformant or compliant Process Reference Models. ISO/IEC TR 15504-5 contains an exemplar Process Assessment Model that is based upon the Process Reference Model defined in ISO/IEC 12207:1995/Amd.1, Annex F.

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Software engineering — Process assessment —

Part 2: Performing an assessment

1 Scope

This part of ISO/IEC 15504 addresses the assessment of process and the application of process assessment for improvement and capability determination. It defines the minimum set of requirements for performing an assessment that will ensure assessment results are objective, impartial, consistent, repeatable and representative of the assessed processes. Results of conformant process assessments may be compared when the scopes of the assessments are considered to be similar. For guidance on this matter, refer to ISO/IEC 15504-4.

The requirements for process assessment defined in this part of ISO/IEC 15504 form a structure which:

- a) facilitates self-assessment;
- b) provides a basis for use in process improvement and capability determination;
- c) takes into account the context in which the assessed process is implemented;
- d) produces a process rating;
- e) addresses the ability of the process to achieve its purpose;
- f) is applicable across all application domains and sizes of organization;
- g) may provide an objective benchmark between organizations.

NOTE Copyright release: users of this part of ISO/IEC 15504 may freely reproduce relevant material as part of any Process Assessment Model, or as part of any demonstration of conformance with this International Standard, so that it can be used for its intended purpose.

2 Normative references

The following referenced documents are indispensable for the application 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 12207:1995/Amd.1:2002, *Information technology — Software life cycle processes*

ISO/IEC TR 15504-9, *Information technology — Software process assessment — Part 9: Vocabulary*¹⁾

ISO/IEC 15288:2002, *Systems engineering — System life cycle processes*

1) A revision of this document is in preparation under the following reference: ISO/IEC 15504-1.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TR 15504-9 apply.

4 Performing an assessment

4.1 General

The purpose of process assessment is to understand the capability of the processes implemented by an organization. As a result of successful implementation of process assessment:

- a) information and data that characterize the processes assessed is determined;
- b) the extent to which the processes achieve the process purpose is determined.

This Clause of ISO/IEC 15504-2 sets out the requirements for an assessment or assessments conformant with this International Standard. The requirements help to ensure that the assessment output is self-consistent and provides evidence to substantiate the ratings. Figure 1 shows the logical arrangement of the normative elements of this International Standard.

NOTE Higher levels of capability may give greater confidence that an organization's business goals will be met; lower levels of capability may indicate potential sources of risk.

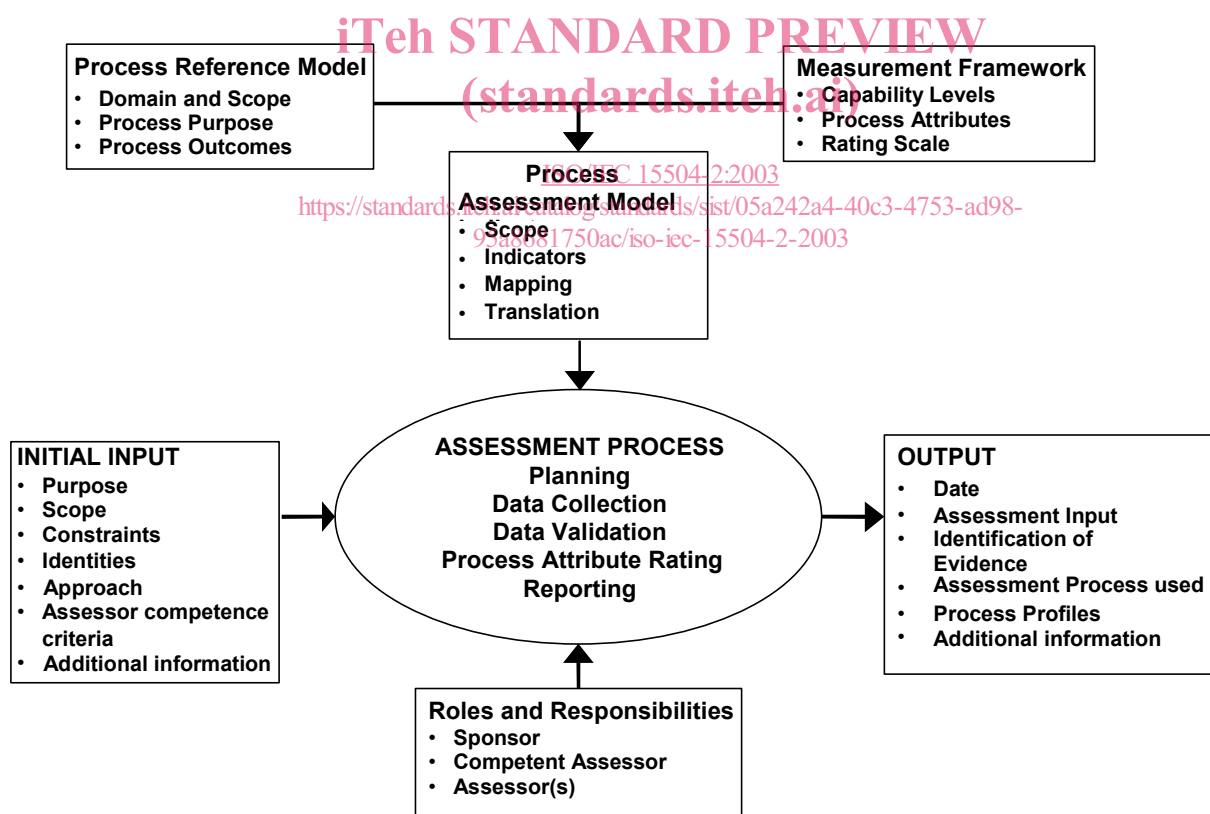


Figure 1 — The normative elements of this International Standard

4.2 The assessment process

4.2.1 The assessment shall be conducted according to a documented assessment process that is capable of meeting the assessment purpose.

4.2.2 The documented assessment process shall contain at minimum the following activities:

- a) **Planning** — a plan for the assessment shall be developed and documented, including at minimum:
 - 1) the required inputs specified in this part of ISO/IEC 15504;
 - 2) the activities to be performed in conducting the assessment;
 - 3) the resources and schedule assigned to these activities;
 - 4) the identity and defined responsibilities of the participants in the assessment;
 - 5) the criteria to verify that the requirements of this International Standard have been met;
 - 6) a description of the planned assessment outputs.
- b) **Data collection** — data required for evaluating the processes within the scope of the assessment (see 4.4.2 c)) and additional information (see 4.4.2 j)) shall be collected in a systematic manner, applying at minimum the following:
 - 1) the strategy and techniques for the selection, collection, analysis of data and justification of the ratings shall be explicitly identified and shall be demonstrable;
 - 2) correspondence shall be established between the organizational unit's processes, specified in the assessment scope, and the elements in the Process Assessment Model;
 - 3) each process identified in the assessment scope shall be assessed on the basis of objective evidence;
 - 4) the objective evidence gathered for each attribute for each process assessed shall be sufficient to meet the assessment purpose and scope;
 - 5) the identification of the objective evidence gathered shall be recorded and maintained to provide the basis for verification of the ratings.
- c) **Data validation** — the data collected shall be validated to:
 - 1) confirm that the evidence collected is objective;
 - 2) ensure that the objective evidence is sufficient and representative to cover the scope and purpose of the assessment;
 - 3) ensure that the data as a whole is consistent.
- d) **Process attribute rating** — a rating shall be assigned based on validated data for each process attribute:
 - 1) the set of process attribute ratings shall be recorded as the process profile for the defined organizational unit;
 - 2) during the assessment, the defined set of assessment indicators in the Process Assessment Model shall be used to support the assessors' judgement in rating process attributes in order to provide the basis for repeatability across assessments;
 - 3) the decision-making process that is used to derive rating judgements shall be recorded;
 - 4) traceability shall be maintained between an attribute rating and the objective evidence used in determining that rating;

- 5) for each process attribute rated, the relationship between the indicators and the objective evidence shall be recorded.
- e) **Reporting** — the assessment results, including at minimum the outputs specified in 4.5, shall be documented and reported to the assessment sponsor or to their delegated representative.

4.3 Roles and responsibilities

4.3.1 The sponsor of the assessment shall:

- a) verify that the individual who is to take responsibility for conformity of the assessment is a competent assessor;
- b) ensure that resources are made available to conduct the assessment;
- c) ensure that the assessment team has access to the relevant resources.

4.3.2 The competent assessor shall:

- a) confirm the sponsor's commitment to proceed with the assessment;
- b) ensure that the assessment is conducted in accordance with the requirements of this part of ISO/IEC 15504;
- c) ensure that participants in the assessment are briefed on the purpose, scope and approach of the assessment;
- d) ensure that all members of the assessment team have knowledge and skills appropriate to their roles;
- e) ensure that all members of the assessment team have access to appropriate documented guidance on how to perform the defined assessment activities;
- f) ensure that the assessment team has the competencies to use the tools chosen to support the assessment;
- g) confirm receipt of the assessment result deliverables by the sponsor;
- h) on completion of the assessment, verify and document the extent of conformance of the assessment to ISO/IEC 15504 (see also 7.4).

4.3.3 The assessor(s) shall:

- a) carry out assigned activities associated with the assessment, e.g. detailed planning, data collection, data validation and reporting;
- b) rate the process attributes.

4.4 Defining the initial assessment input

4.4.1 The assessment input shall be defined prior to the data collection phase of an assessment and approved by the sponsor of the assessment or the sponsor's delegated authority.

4.4.2 At minimum, the assessment input shall specify:

- a) the identity of the sponsor of the assessment and the sponsor's relationship to the organizational unit being assessed;
- b) the assessment purpose;

- c) the assessment scope including:
 - 1) the processes to be investigated within the organizational unit;
 - 2) the highest capability level to be investigated for each individual process within the assessment scope;
 - 3) the organizational unit that deploys the processes;
 - 4) the context which includes:
 - i) the size of the organizational unit;
 - ii) the application domain of the products or services of the organizational unit;
 - iii) key characteristics (e.g. size, criticality, complexity and quality) of the products or services of the organizational unit;
- d) the assessment approach;
- e) the assessment constraints considering, at minimum:
 - 1) availability of key resources;
 - 2) the maximum duration of the assessment;
 - 3) specific processes or organizational units to be excluded from the assessment;
 - 4) the quantity and type of objective evidence to be examined in the assessment;
 - 5) the ownership of the assessment outputs and any restrictions on their use;
 - 6) controls on information resulting from a confidentiality agreement;
- f) the identity of the Process Assessment Model (including the identity of the Process Reference Model(s) used) that meets the requirements defined in 6.3;
 - 1) if the Process Reference Model(s) includes system or software engineering processes then the relationship of these processes with ISO/IEC 15288 or ISO/IEC 12207:1995/Amd.1:2002, Annex F shall be defined;
- g) the identity of the competent assessor;
- h) the criteria for competence of the assessor who is responsible for the assessment;
- i) the identity and roles of assessees, the assessment team and assessment support staff with specific responsibilities for the assessment;
- j) any additional information to be collected during the assessment to support process improvement or process capability determination, e.g. specific data (or measurement results) that are needed to quantify the organization's ability to meet a particular business goal (this may also include information detailed at 6.3.5 and associated note).

4.4.3 Any changes in the assessment input shall be agreed with the sponsor or the sponsor's delegated authority and documented in the assessment record.