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Information technology — Process assessment —

Part 1: Concepts and vocabulary

Technologies de l'information — Évaluation des procédés —

Partie 1: Concepts et vocabulaire

Reference number
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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.

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

This edition cancels and replaces ISO/IEC TR 15504-1:1998 and ISO/IEC TR 15504-9:1998, which have been technically revised.

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

— *Part 1: Concepts and vocabulary*

— *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 part is in preparation:

— *Part 5: An exemplar Process Assessment Model*

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

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Introduction

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

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

ISO/IEC 15504-4 identifies process assessment as an activity that can be performed either as part of a process improvement initiative or as part of a capability determination approach. The purpose of process improvement is to continually improve the organization's effectiveness and efficiency. The purpose of process capability determination is to identify the strengths, weaknesses and risks of selected processes with respect to a particular specified requirement through the processes used and their alignment with the business need.

ISO/IEC 15504-5 contains an exemplar Process Assessment Model that is based upon the Process Reference Model defined in ISO/IEC 12207 Amd 1 Annex F and Amd 2. An assessment is carried out utilizing conformant Process Assessment Model(s) related to one or more conformant or compliant Process Reference Models.

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Information technology — Process assessment —

Part 1: Concepts and vocabulary

1 Scope

This part of ISO/IEC 15504 provides overall information on the concepts of process assessment and its use in the two contexts of process improvement and process capability determination. It describes how the parts of the suite fit together, and provides guidance for their selection and use. It explains the requirements contained within ISO/IEC 15504, and their applicability to performing assessments.

Readers of this guide should familiarize themselves with the terminology and structure of the document suite, and then reference the appropriate parts of the suite for the context in which they propose to conduct an assessment. A more detailed description of the use of ISO/IEC 15504 is given in clause 4.

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 9000:2000, *Quality management systems — Fundamentals and vocabulary*

ISO/IEC 2382-1:1993, *Information technology — Vocabulary — Part 1: Fundamental terms*

ISO/IEC 2382-20:1990, *Information technology — Vocabulary — Part 20: System development*

ISO/IEC 12207:1995, Amd 1:2002, Amd 2:2004. *Information technology — Software life cycle processes*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000, ISO/IEC 2382-1, ISO/IEC 2382-20, ISO/IEC 12207 and ISO/IEC 15288 and the following apply.

3.1
acquirer
the stakeholder that acquires or procures a product or service from a supplier

[ISO/IEC 15288]

NOTE Other terms commonly used for an acquirer are buyer, customer, purchaser. The acquirer may at the same time be the owner, user or operating organization.

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3.2
assessed capability
the output of one or more relevant process assessments conducted in accordance with the provisions of ISO/IEC 15504

3.3
assessment constraints
restrictions placed on the use of the assessment outputs and on the assessment team's freedom of choice regarding the conduct of the assessment

3.4
assessment indicator
sources of objective evidence used to support the assessors' judgement in rating process attributes

EXAMPLE Work products, practice, or resource

3.5
assessment input
information required before a process assessment can commence

3.6
assessment instrument
a tool or set of tools that is used throughout an assessment to assist the assessor in evaluating the performance or capability of processes, in handling assessment data and in recording the assessment results

3.7
assessment output
all of the tangible results from an assessment (see *assessment record*)

3.8
assessment participant
an individual who has responsibilities within the scope of the assessment

NOTE Examples include but are not limited to the assessment sponsor, assessors, and organizational unit members.

3.9
assessment process
a determination of the extent to which the organization's standard processes contribute to the achievement of its business goals and to help the organization focus on the need for continuous process improvement

[ISO/IEC 12207 Amd 1]

3.10
assessment purpose
a statement, provided as part of the assessment input, which defines the reasons for performing the assessment

3.11
assessment record
an orderly, documented collection of information which is pertinent to the assessment and adds to the understanding and verification of the process profiles generated by the assessment

3.12
assessment scope
a definition of the boundaries of the assessment, provided as part of the assessment input, encompassing the organizational limits of the assessment, the processes to be included, and the context within which the processes operate (see *process context*)

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3.13
assessment sponsor
the individual or entity, internal or external to the organizational unit being assessed, who requires the assessment to be performed, and provides financial or other resources to carry it out

3.14
assessment team
one or more individuals who jointly perform a process assessment

3.15
assessor
an individual who participates in the rating of process attributes

NOTE An assessor is either a competent assessor or a provisional assessor.

3.16
attribute indicator
an assessment indicator that supports the judgement of the extent of achievement of a specific process attribute

3.17
base practice
an activity that, when consistently performed, contributes to achieving a specific process purpose

3.18
capability dimension
the set of elements in a Process Assessment Model explicitly related to the Measurement Framework for Process Capability

NOTE The attributes are organized into capability levels, comprising an ordinal scale of process capability.

3.19
capability indicator
an assessment indicator that supports the judgement of the process capability of a specific process

NOTE An attribute indicator is a specific instance of a capability indicator.

3.20
competent assessor
an assessor who has demonstrated the competencies to conduct an assessment and to monitor and verify the conformance of a process assessment

3.21
defined process
a process that is managed (planned, monitored and adjusted), and tailored from the organization's set of standard processes according to the organization's tailoring guidelines

NOTE A defined process has a maintained process description; and contributes work products, measures, and other process improvement information to the organization's process assets. A project's defined process provides a basis for planning, performing, and improving the project's tasks and activities of the project.

3.22
generic practice
an activity that, when consistently performed, contributes to the achievement of a specific process attribute

3.23
indicator
(see *assessment indicator*)

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3.24
objective evidence
data supporting the existence or verity of something

NOTE Objective evidence may be obtained through observation, measurement, test, or other means.

[ISO 9000:2000]

3.25
organizational unit
that part of an organization that is assessed

NOTE 1 An organizational unit deploys one or more processes that have a coherent process context and operates within a coherent set of business goals.

NOTE 2 An organizational unit is typically part of a larger organization, although in a small organization, the organizational unit may be the whole organization. An organizational unit may be, for example:

- a specific project or set of (related) projects;
- a unit within an organization focused on a specific lifecycle phase (or phases) such as acquisition, development, maintenance or support;
- a part of an organization responsible for all aspects of a particular product or product set.

3.26
performance indicator
an assessment indicator that supports the judgement of the process performance of a specific process

NOTE A performance indicator is an attribute indicator for Process Attribute 1.1 for a specific process. (See ISO/IEC 15504-2.)

3.27
practice
an activity that contributes to the purpose or outcomes of a process or enhances the capability of a process

3.28
process
set of interrelated or interacting activities which transforms inputs into outputs

[ISO 9000]

3.29
process assessment
a disciplined evaluation of an organizational unit's processes against a Process Assessment Model

3.30
Process Assessment Model
a model suitable for the purpose of assessing process capability, based on one or more Process Reference Models

3.31
process attribute
a measurable characteristic of process capability applicable to any process

3.32
process attribute rating
a judgement of the degree of achievement of the process attribute for the assessed process

3.33
process capability
a characterization of the ability of a process to meet current or projected business goals

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3.34
process capability determination
a systematic assessment and analysis of selected processes within an organization against a target capability, carried out with the aim of identifying the strengths, weaknesses and risks associated with deploying the processes to meet a particular specified requirement

3.35
process capability determination sponsor
the individual or entity, internal or external to the organizational unit being assessed, who requires the process capability determination to be performed, and provides financial or other resources to carry it out

3.36
process capability level
a point on the six-point ordinal scale (of process capability) that represents the capability of the process; each level builds on the capability of the level below

3.37
process capability level rating
a representation of the achieved process capability level derived from the process attribute ratings for an assessed process

3.38
process context
the set of factors, documented in the assessment input, that influence the judgment, comprehension and comparability of process attribute ratings

3.39
process dimension
the set of elements in a Process Assessment Model explicitly related to the processes defined in the relevant Process Reference Model(s)

NOTE The processes may be grouped based on different criteria. For example in 15504-5 they are grouped into categories of related activities

3.40
process improvement
actions taken to change an organization's processes so that they more effectively and/or efficiently meet the organization's business goals

3.41
process improvement programme
all the strategies, policies, goals, responsibilities and activities concerned with the achievement of specified improvement goals

NOTE A process improvement programme can span more than one complete cycle of process improvement.

3.42
process improvement project
any subset of the process improvement programme that forms a coherent set of actions to achieve a specific improvement

3.43
process improvement sponsor
the individual or entity, internal or external to the organizational unit being assessed, who requires the process improvement to be performed, and provides financial or other resources to carry it out

3.44
process outcome
an observable result of a process

NOTE An outcome is an artefact, a significant change of state or the meeting of specified constraints.

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3.45
process performance
the extent to which the execution of a process achieves its purpose

3.46
process profile
the set of process attribute ratings for an assessed process

3.47
process purpose
the high level measurable objectives of performing the process and the likely outcomes of effective implementation of the process

3.48
Process Reference Model
a model comprising definitions of processes in a life cycle described in terms of process purpose and outcomes, together with an architecture describing the relationships between the processes

3.49
provisional assessor
a person who has the skills and competencies to carry out assessments under the guidance and supervision of a competent assessor

3.50
standard process
the set of definitions of the basic processes that guide all processes in an organization

NOTE 1 These process definitions cover the fundamental process elements (and their relationships to each other) that must be incorporated into the defined processes that are implemented in projects across the organization. A standard process establishes consistent activities across the organization and is desirable for long-term stability and improvement.

NOTE 2 The organization's set of standard processes describes the fundamental process elements that will be part of the projects' defined processes. It also describes the relationships (for example, ordering and interfaces) between these process elements.

3.51
supplier
an organization or an individual that enters into an agreement with the acquirer for the supply of a product or service

[ISO/IEC 15288]

3.52
tailoring guideline
instructions that enable an organization to adapt the process description of standard processes appropriately to meet specific needs

NOTE 1 Tailoring a process adapts the process description for a particular end. For example, a project creates its defined process by tailoring the organization's set of standard processes to meet the objectives, constraints, and environment of the project. The organization's set of standard processes is described at a general level that may not be directly usable to perform a process. Tailoring guidelines aid those who establish the defined processes for specific needs.

NOTE 2 Tailoring guidelines describe what can and cannot be modified and identify process components that are candidates for modification.

3.53
tailored process
a defined process developed by tailoring a standard process definition

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3.54
target capability
the process capability which the process capability determination sponsor judges will represent an acceptable process risk to the successful implementation of the specified requirement

3.55
work product
an artefact associated with the execution of a process

[ISO 9000]

NOTE There are four generic product categories, as follows: services (e.g. operation); software (e.g. computer program, documents, information, contents); hardware (e.g. computer, device); processed materials.

4 Concept

4.1 General

4.1.1 Purpose and benefits

ISO/IEC 15504 provides a structured approach for the assessment of processes for the following purposes:

— by or on behalf of an organization with the objective of understanding the state of its own processes for process improvement;

— by or on behalf of an organization with the objective of determining the suitability of its own processes for a particular requirement or set of requirements;

— by or on behalf of one organization with the objective of determining the suitability of another organization's processes for a particular contract or set of contracts.

The framework for process assessment:

— facilitates self-assessment;

— provides a basis for use in process improvement and capability determination;

— takes into account the context in which the assessed process is implemented;

— produces a process rating;

— addresses the ability of the process to achieve its purpose;

— is appropriate across all application domains and sizes of organization;

— may provide an objective benchmark between organizations.

One method for an organization to improve product quality is through the use of a proven, consistent and reliable method for assessing the state of its processes and using the results as part of a coherent improvement programme.

The use of process assessment within an organization should encourage:

— the culture of continuous improvement and the establishment of the proper mechanisms to support and maintain that culture;

— the engineering of processes to meet business requirements;

— the optimisation of resources.

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Through this, the organization is expected to become a capable organization that maximizes their responsiveness to customer and market requirements, minimizes the full life-cycle costs of their products and as a result maximize end-user satisfaction.

Acquirers may benefit from the use of process assessment. Its use in capability determination can:

— reduce uncertainties in selecting suppliers by enabling the risks associated with the contractor's capability to be identified before award of contract;

— enable appropriate controls to be put in place for risk containment;

— provide a quantified basis for choice in balancing business needs, requirements and estimated project cost against the capability of competing suppliers.

The major benefits of a standardized approach to process assessment, are, that it will:

— provide a public, shared approach for process assessment;

— lead to a common understanding of the use of process assessment for process improvement and process capability determination;

— facilitate capability determination in procurement;

— be controlled and regularly reviewed in the light of experience of use;

— be changed only by international consensus;

— encourage harmonization of existing schemes.

The approach to process assessment defined in ISO/IEC 15504 is designed to provide a basis for a common approach to describing the results of process assessment, allowing for some degree of comparison of assessments based upon different but compatible models and methods. The sophistication and complexity required of a process is dependent upon its context. For instance, the planning required for a five person project team is much less than for a fifty person team. This context affects how a competent assessor judges a practice when assessing its adequacy and influences the degree of comparability between process profiles.

4.1.2 Field of application

Process assessment has two principal contexts for its use, as shown diagrammatically in Figure 1.

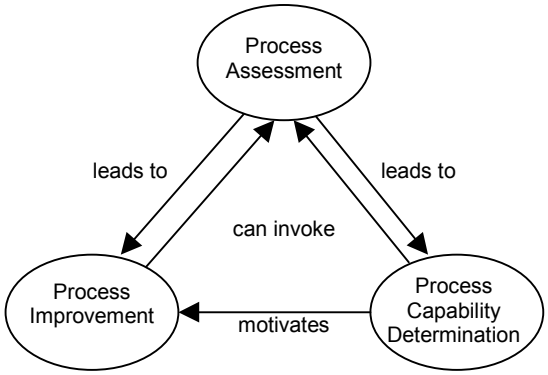


Figure 1 — Process assessment relationship

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Within a process improvement context, process assessment provides the means of characterizing the current practice within an organizational unit in terms of the capability of the selected processes. Analysis of the results identifies strengths, weaknesses and risks inherent in the processes. These provide the drivers for prioritizing improvements to processes.

Process capability determination is concerned with analysing the proposed capability of selected processes against a target process capability profile in order to identify some of the risks involved in undertaking a project using the selected processes. The proposed capability may be based on the results of relevant previous process assessments, or may be based on an assessment carried out for the purpose of establishing the proposed capability.

Part 4 of ISO/IEC 15504 addresses the use of process assessment for process improvement and for process capability determination.

ISO/IEC 15504 has been designed to satisfy the needs of acquirers, suppliers and assessors, and their individual requirements from within a single source.

The benefits arising from the use of this suite of documents include:

For **acquirers:**

— an ability to determine the current and potential capability of a supplier's processes.

For **suppliers:**

— an ability to determine the current and potential capability of their own processes;

— an ability to define areas and priorities for process improvement;

— a framework that defines a road map for process improvement.

For **assessors:**

— a framework for conducting assessments.

ISO/IEC 15504 is not intended to be used in any scheme for the certification/registration of the process capability of an organization.

ISO/IEC 15504 provides a framework for the assessment of processes. This framework can be used by organizations involved in planning, managing, monitoring, controlling and improving the acquisition, supply, development, operation, maintenance and support of products/services.

Process assessment examines the processes used by an organization to determine whether they are effective in achieving their goals. The assessment characterizes the current practice within an organizational unit in terms of the capability of the selected processes. The results may be used to drive process improvement activities or process capability determination by analyzing the results in the context of the organization's business needs, identifying strengths, weaknesses and risks inherent in the processes.

4.1.3 Components of ISO/IEC 15504

This section describes how to use the other parts of ISO/IEC 15504 to conduct process assessments and make effective use of their results. The key determinant in the use of ISO/IEC 15504 is the purpose for which the assessment is being conducted. This may be:

— to support process improvement;

— to support process capability determination.

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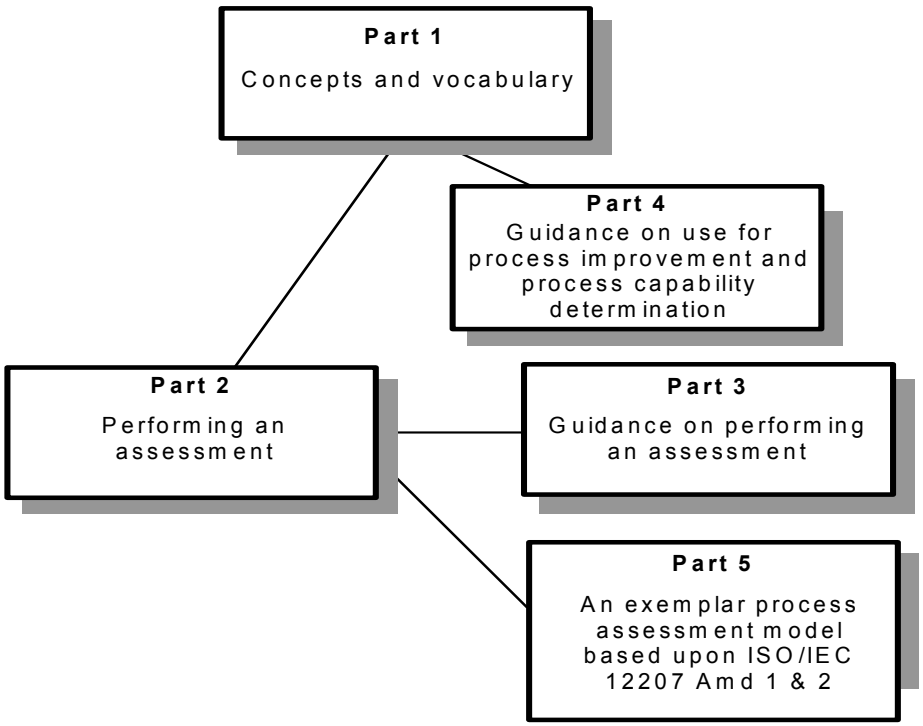


Figure 2 — Components of ISO/IEC 15504

Figure 2 shows a potential road map for users of ISO/IEC 15504. Part 1 (this document) provides a general entry point to ISO/IEC 15504. It also contains the consolidated terms and definitions for ISO/IEC 15504. Readers with specific interest in either process improvement or supplier capability determination should then read part 4 for detailed guidance on these contexts of use. This part will enable the user to identify the appropriate usage of the normative components of ISO/IEC 15504 (part 2). Part 3 provides guidance of the application of part 2 while part 5 is an exemplar assessment model compatible with the requirements of ISO/IEC 15504 (part 2).

Table 1 identifies the principal classes of reader for ISO/IEC 15504 and shows where their primary areas of interest are addressed within the document set.

Table 1 — Readership of ISO/IEC 15504

Class of Reader	Interests	Suggested parts to be read
Assessment Sponsor	How an assessment is conducted, what tools and other support are required, how to initiate an assessment.	1, 2, 3
Process Improvement Sponsor	Initiating an improvement programme, defining assessment inputs for an assessment for improvement purposes, using assessment results for improvement.	1, 4
Process Capability Determination Sponsor	Initiating a programme for the determination of supplier capability, defining a target capability profile, verifying and using assessment results in a capability determination exercise.	1, 4

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Table 1 (*continued*)

Class of Reader	Interests	Suggested parts to be read
Assessors	Conducting a conformant assessment, developing the skills and competencies needed to perform an assessment.	1, 2, 3, 4, 5
Developers of Process Assessment Models	Developing Process Assessment Models for performing assessments based on a compliant Process Reference Model and the measurement framework as defined in ISO/IEC 15504-2.	1, 2, 3, 5
Developers of Assessment Methods	Developing a method that will support the performance of conformant assessments.	1, 2, 3, 5
Tool Developers	Developing tools that will support assessors by collecting, recording and classifying evidence in the performance of assessments.	1, 2, 3, 5

Part 1 (informative) is an entry point into ISO/IEC 15504. It describes how the parts of the suite fit together, and provides guidance for their selection and use. It explains the requirements contained within ISO/IEC 15504 and their applicability to the performance of an assessment. It also contains the consolidated terms and definitions for ISO/IEC 15504.

Part 2 (normative) sets out normative requirements for process assessment and for process models in an assessment, and defines a measurement framework for evaluating process capability. The measurement framework defines nine process attributes that are grouped into six process capability levels that define an ordinal scale of capability that is applicable across all selected processes.

Part 3 (informative) of ISO/IEC 15504 provides guidance on meeting the requirements for performing an assessment contained in ISO/IEC 15504-2. It provides an overview of process assessment and interprets the requirements through the provision of guidance on:

— an assessment process;

— the measurement framework for Process Capability;

— Process Reference Models and Process Assessment Models;

— instruments or tools for assessments;

— competency of the assessors.

Part 4 (informative) This part of ISO/IEC 15504 provides guidance on utilizing process assessment for the purposes of process improvement and capability determination. The guidance provided does not presume specific organizational structures, management philosophies, life cycle models or development methods. In the case of process improvement, the concepts and principles are appropriate for the full range of different business needs, application domains and sizes of organization, so that they may be used by all types of organizations to guide their improvement activities. In the case of process capability determination, this guidance is intended to be applicable within any customer-supplier relationship, and to any organization wishing to determine the process capability of its own processes.

Part 5 (informative) of ISO/IEC 15504 provides an exemplar model for performing process assessments that is based upon and directly compatible with the Process Reference Model in ISO/IEC 12207 Amd 1 and Amd 2. 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 is based upon the Measurement Framework defined in Part 2. The assessment model(s) extend the Process Reference Model and the Measurement Framework through the inclusion of a comprehensive set of indicators of process performance and capability.

The high level view of the relationships between process assessment, process improvement and process capability determination is shown in Figure 1.

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Figure 3 shows an indication of the places of the various components of ISO/IEC 15504 in the processes. An assessment may be used for purposes of either process improvement or capability determination. Guidance on such usage is found in ISO/IEC 15504-4. Performing an assessment requires an assessment model (or models) referred to in ISO/IEC 15504-2; an exemplar model is provided in ISO/IEC 15504-5. The assessment process must be documented and should be based upon a method in line with the requirements defined in ISO/IEC 15504-2 and following the guidance provided in ISO/IEC 15504-3. A competent assessor is responsible for ensuring that the assessment is conformant. Guidance for tools, verification and the necessary skills and competencies is provided in ISO/IEC 15504-3.

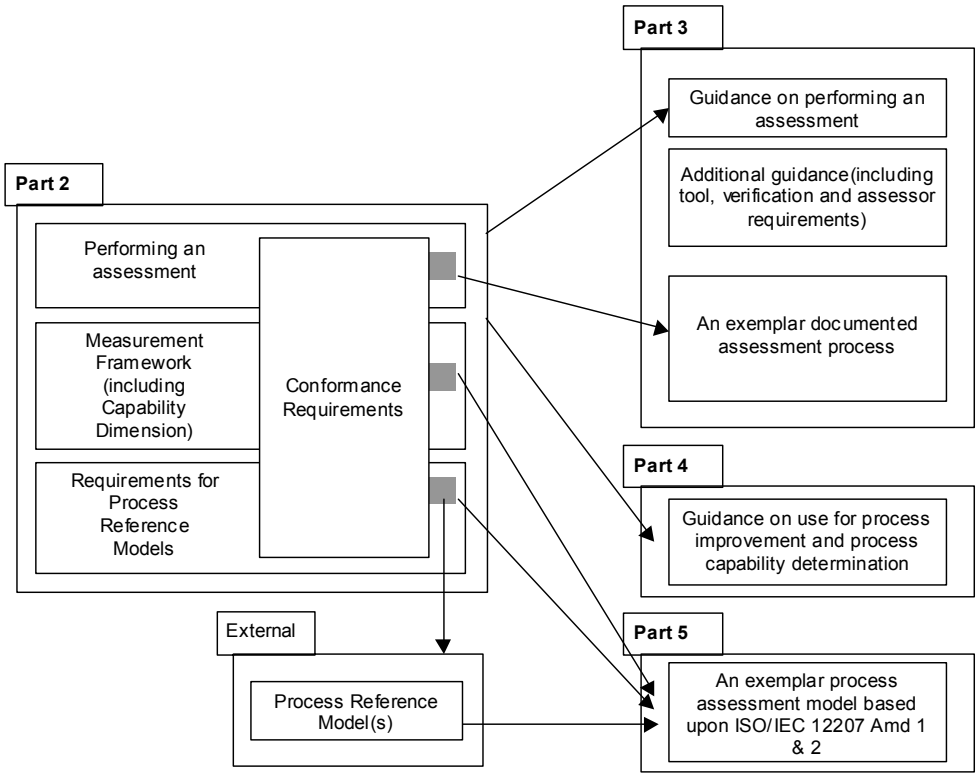


Figure 3 — Overview of relationship among elements of ISO/IEC 15504

ISO/IEC 15504 is designed to provide assessment results that are repeatable, objective, comparable within similar contexts, and able to be used for either process improvement or process capability determination.

The framework for the conduct of assessments is designed to support the achievement of dependable assessment results. The framework includes an architecture for rating processes and for presenting assessment ratings. The assessment framework also provides guidance on the conduct of the assessment. ISO/IEC 15504 provides guidance in the contexts of both process improvement and process capability determination. It further provides a definition of the required skills and experience for assessors.

4.1.4 Relationship to other International Standards

ISO/IEC 15504 incorporates the intent of the ISO 9000 series to provide confidence in a supplier's quality management while providing acquirers with a framework for assessing whether potential suppliers have the capability to meet their needs. Process assessment provides users with the ability to evaluate process capability on a continuous scale in a comparable and repeatable way, rather than using the pass/fail characteristic of quality audits based on ISO 9001. ISO/IEC 15504 can be used within ISO 9001 sub-clause 8.2.3 (Monitoring and measurement of processes) as a means to measure the quality of the management system processes. In addition, the framework described in ISO/IEC 15504 provides the opportunity to adjust the scope of assessment to cover specific processes of interest, rather than all of the processes used by an organizational unit.

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ISO/IEC 12207 Amd 1 and Amd 2 and ISO/IEC 15288 are especially important to this Standard. ISO/IEC 15504-2 indicates that if the Process Reference Model(s) used in the Process Assessment Model includes system or software. engineering processes then the relationship of these processes with ISO/IEC 15288 or ISO/IEC 12207 Amd 1 (Annex F) and Amd 2 must be defined.

4.2 The assessment framework

4.2.1 The context of assessment process

The context of an assessment process is summarized in Figure 4. ISO/IEC 15504-2 defines a measurement framework that provides a basis for rating the capability of processes, based on their achievement of defined process attributes. ISO/IEC 15504-2 also defines the requirements for performing an assessment and sets out the circumstances under which assessment results may be compared. ISO/IEC 15504-3 provides guidance on performing an assessment and interpreting the requirements in ISO/IEC 15504-2. This guidance is generic enough to be applicable across all organizations, and for conducting assessments using a variety of methods, techniques and tools.

Process assessment is performed either during a process improvement initiative or as part of a process capability determination exercise as described in ISO/IEC 15504-4. In either case, the formal entry to the assessment processes occurs with the assessment sponsor's commitment to proceed. The assessment input may then be compiled. The assessment input defines the purpose of the assessment (why it is being carried out), the scope of the assessment, and what constraints, if any, apply to the assessment. The assessment input also defines the responsibilities for carrying out the assessment.

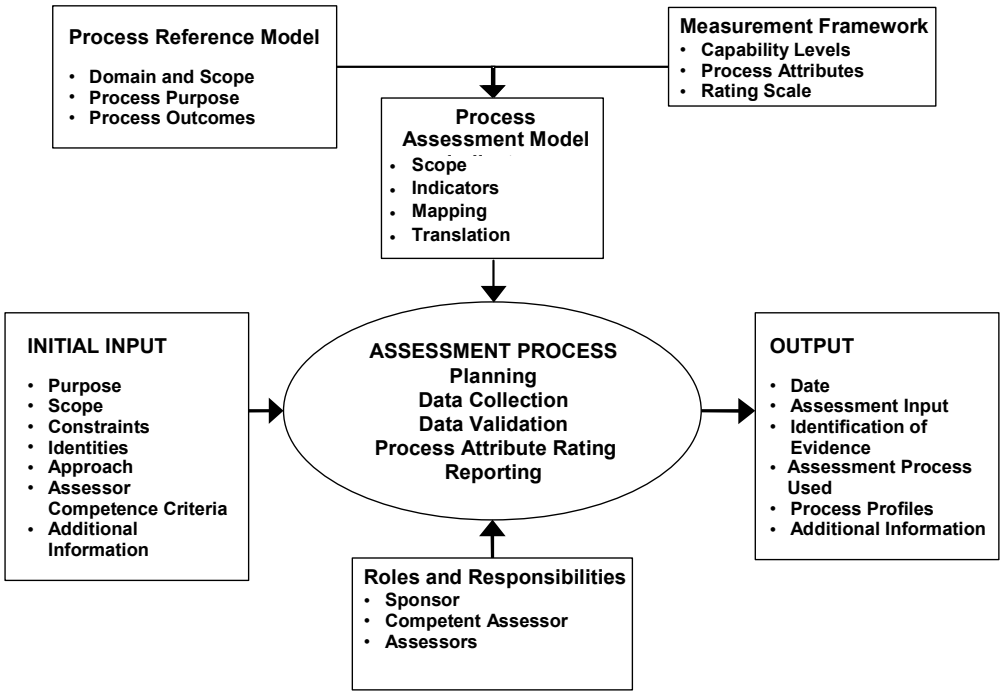


Figure 4 —Major elements of the assessment process

An assessment is carried out by assessing selected processes against the assessment model(s) chosen for the assessment. The assessment model(s) have to be compatible with the requirements defined in ISO/IEC 15504-2. The Process Reference Model is selected according to the application domain of interest. For example, in the field of software engineering, the process models in ISO/IEC 12207 Amd 1 and 2 apply. Figure 5 shows the relationship between a Process Reference Model, corresponding assessment model and the measurement framework. The two-dimensional model, as depicted in Figure 5, consists of a set of processes defined in terms of their purpose and outcomes and a measurement framework which contains a set of process attributes. The process attributes apply across all processes. They are grouped into capability levels that may be used to determine the capability of the process. The assessment output includes a set of process profiles and optionally a capability level rating for each process assessed.

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The assessment process contains at least five specified activities: planning, data collection, data validation, process attribute rating, and reporting. The assessment process must be documented; in addition, the assessors must record the objective indicators of performance or capability used to justify the ratings. The process assessment is carried out by a team with at least one competent assessor who has the competencies described in ISO/IEC 15504-3.

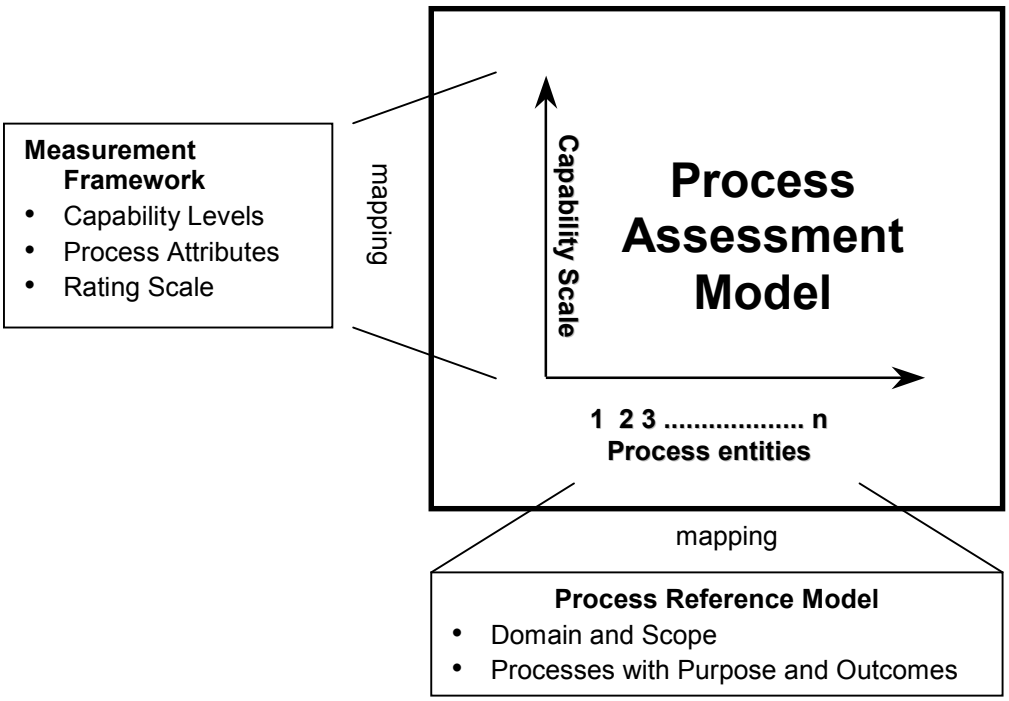


Figure 5 — Process Assessment Model relationships

4.2.2 Assessment indicators

In order to maximize the repeatability, reliability and consistency of assessments, documented evidence justifying the ratings of process capability must be recorded and retained. This evidence is in the form of indicators of process performance and capability, which typically take the form of objectively demonstrated characteristics of work products and practices associated with the processes assessed. A complete model for process assessment contains details of the indicators to be used.

The simplest way in which such indicators can be documented is through the use of some form of assessment instrument. Instruments may be designed for manual operation (for example, in the forms of checklists or questionnaires), or for automated operation. ISO/IEC 15504-3 includes guidance concerning the availability and use of indicators during the assessment. Guidance for the selection and use of assessment instruments and tools is included in ISO/IEC 15504-3.

4.3 Competency of assessors

The competent assessor in a team has the pivotal role of ensuring that the team members collectively have the right blend of specialized knowledge and assessment skills. The competent assessor provides the necessary guidance to the team, and helps to moderate the judgments and ratings made by the members of the team to ensure consistency of interpretation.

ISO/IEC 15504-3 is concerned with assessor competencies and appropriate education, training and experience, and includes mechanisms that may be used to demonstrate competence and to validate education, training and experience.

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Assessor competence results from the knowledge of the process being assessed, possessing skills in the application of the principle technologies of ISO/IEC 15504, and personal attributes which contribute to effective performance.

Knowledge, skills and personal attributes are gained by a combination of education, training and experience.

4.4 Process improvement context

Successful process improvement occurs in a business context by addressing specific needs and business goals of the organization, and by understanding the key constraints such as resources, culture, etc. that are clearly stated and understood.

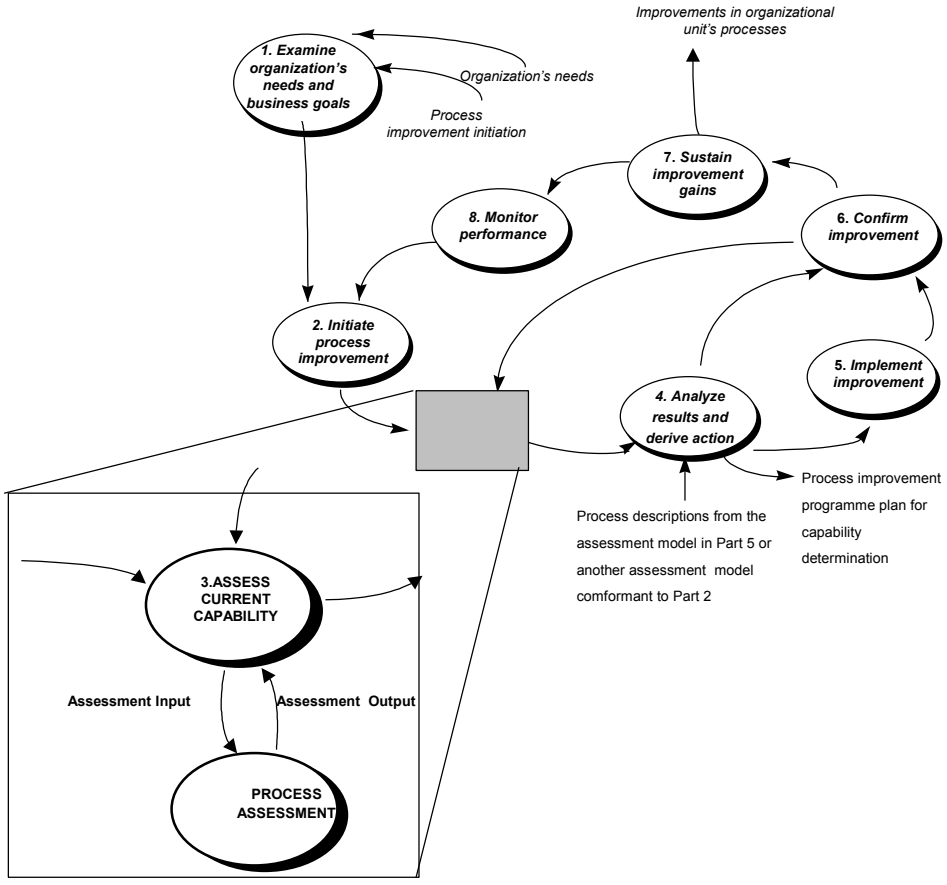


Figure 6 — Process improvement

ISO/IEC 15504-4 provides guidance on using process assessment as part of a complete framework and method for performing process improvement in a continuous cycle although there is no reason why the organization could not employ the guidance for a single cycle of improvement activity. The overall context of process improvement is shown in Figure 6. The guidance covers:

— invoking a process assessment;

— using the results of a process assessment;

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— measuring process effectiveness and improvement effectiveness;

— identifying improvement actions aligned to business goals;

— cultural issues in the context of process improvement;

— dealing with management issues for process improvement.

4.5 Process capability determination context

The procedure for process capability determination is described in ISO/IEC 15504-4. Process capability determination is mainly built upon process assessment as described in ISO/IEC 15504-2. Processes are rated against an assessment model or models and results are expressed using the measurement and rating framework included in the process capability. The context of process capability determination is shown in Figure 7.

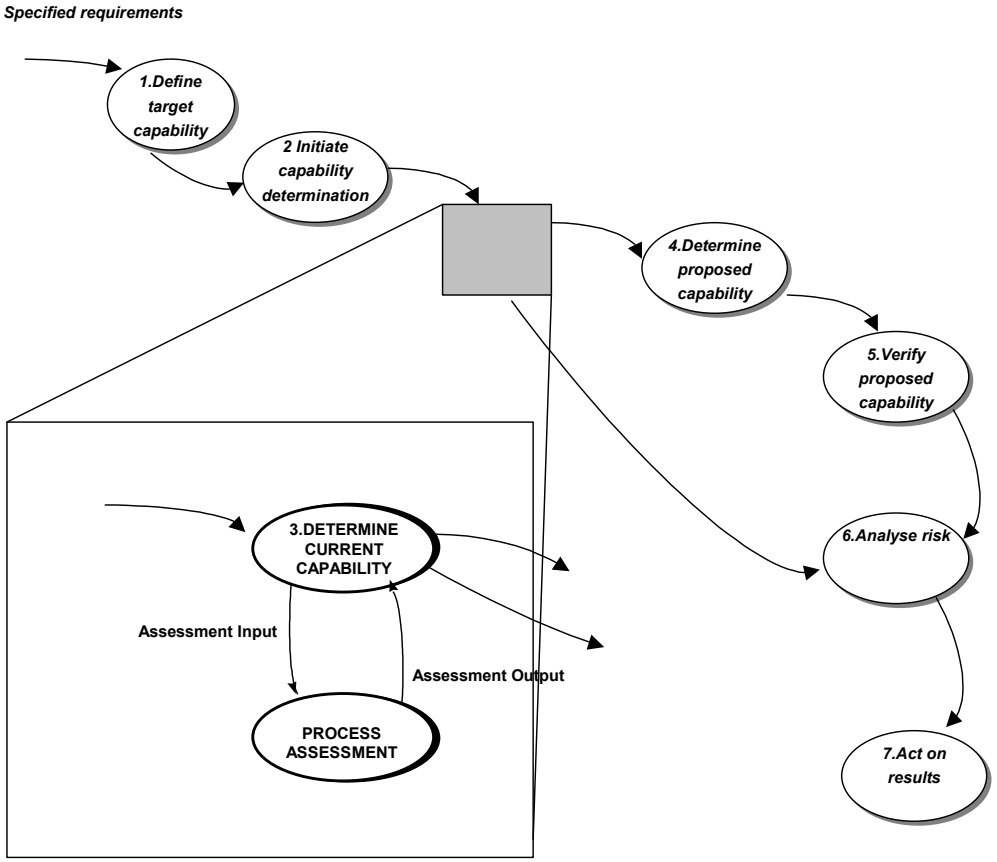


Figure 7 — Process capability determination

An acquirer of products or services has technical and other needs as expressed in the specified requirements. Before making a contract the acquirer may need to determine the process capability of the prospective contractor, or a supplier may want to ascertain its own process capability before responding to an acquirer's request for proposal. The technical and other needs for process capability determination are documented in the specified requirements.

The specified requirement is translated into: 1) a target capability that represents the required process capability. 2) the process assessment input that will scope the process assessment. The supplier may put forward a proposed process capability as a set of process-by-process capability level ratings to be offered by the organizational unit concerned. In a straightforward situation, the proposed process capability may be

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based on a recent self-assessment or by other means. In more complex cases, a supplier may propose a process capability to be achieved in the future based on the supplier's current process profile and relevant improvement plans, backed up if possible with improvement records, or a constructed capability including the capability of one or more sub-contractors or partners. Alternatively the results of an assessment can be used for several different contracts, or the comparison of several contenders for a contract. For such complex cases, refer to the description in ISO/IEC 15504-4.

The credibility of the proposed process capability is analyzed together with the risks involved and reported in the process capability report.

ISO/IEC 15504-4 provides guidance on how to use the results of an assessment for the purpose of determining the process capability of suppliers. The guide specifically addresses process capability determination both for use within an organization to determine the risks associated with undertaking a new project (sometimes called first party use) and for use by an acquirer for assessing external suppliers (sometimes called second party or contractual use).

5 Conformance

ISO/IEC 15504 contains three principal areas where conformance may be claimed:

— conformance of Process Reference Models;

— conformance of Process Assessment Models;

— conformance of process assessments.

Conformance is addressed in ISO/IEC 15504-2 (Section 7) and ISO/IEC 15504-3 (Section 11).

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Annex A
(informative)

Classified terms and definitions

This section groups terms, as defined in Section 3, into the major categories of intended usage.

A.1 Model architecture terms

The following terms are relevant to the general concepts of ISO/IEC 15504.

process
process assessment
process assessment model
process capability determination
process improvement
process reference model

A.2 Process terms

The following terms are relevant to the process concepts.

acquirer
practice
process
process dimension
process outcome
process performance
process purpose
supplier
tailoring guideline
work product

A.3 Measurement framework terms

The following terms are relevant to the measurement framework.

assessment indicator
attribute indicator
base practice
capability dimension
capability indicator
defined process
generic practice
indicator
performance indicator
practice
process attribute
process attribute rating
process capability
process capability level
process capability level rating

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process dimension
process performance
process profile
standard process
tailored process

A.4 Assessment process terms

The following terms are relevant to performing assessments.

assessed capability
assessment constraints
assessment input
assessment instrument
assessment output
assessment participant
assessment process
assessment purpose
assessment record
assessment scope
assessment sponsor
assessment team
objective evidence
organizational unit
process context

A.5 Assessor terms

The following terms describe the competency of assessors.

assessor
competent assessor
provisional assessor

A.6 Process improvement terms

The following terms are relevant to process improvement concepts.

process improvement
process improvement programme
process improvement project
process improvement sponsor
target capability

A.7 Process capability determination terms

The following terms are relevant to process capability determination concepts.

assessed capability
process capability determination
process capability determination sponsor
target capability

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