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Information technology — Software process assessment —

Part 6:
Guide to competency of assessors

Technologies de l'information — Évaluation des procédés du logiciel —
Partie 6: Guide pour la compétence des évaluations

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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.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 15504-6, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology,* Subcommittee SC 7, *Software engineering*.

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

— *Part 1: Concepts and introductory guide*

— *Part 2: A reference model for processes and process capability*

— *Part 3: Performing an assessment*

— *Part 4: Guide to performing assessments*

— *Part 5: An assessment model and indicator guidance*

— *Part 6: Guide to competency of assessors*

— *Part 7: Guide for use in process improvement*

— *Part 8: Guide for use in determining supplier process capability*

— *Part 9: Vocabulary*

Annexes A to G of this part of ISO/IEC TR 15504 are for information only.

Introduction

Conducting a software process assessment in accordance with the provisions of ISO/IEC TR 15504 assumes that the assessment team includes at least one competent assessor. The competent assessor has the responsibility for ensuring that the requirements are met during the assessment.

As described in ISO/IEC TR 15504-3 and ISO/IEC TR 15504-4, rating the assessed processes ultimately depends on the skilled judgment of the assessors. The various elements of ISO/IEC TR 15504 provide the framework within which assessors exercise judgment, working together to remove, or at least reduce to a minimum, any subjective elements. Nevertheless, the achievement of an acceptable level of consistency, repeatability and reliability of results relies on competent assessors with appropriate skills, experience, and knowledge of the software process, of the model for processes described in ISO/IEC TR 15504-2, and of performing assessments as described in ISO/IEC TR 15504-3 and ISO/IEC TR 15504-4.

The competent assessor in a team has the pivotal role of ensuring that other 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 other members of the team to ensure consistency of interpretation.

This part of ISO/IEC TR 15504 is concerned with assessor competencies and appropriate education, training and experience including mechanisms that may be used to demonstrate competence and to validate education, training and experience.

This part of ISO/IEC TR 15504 is primarily directed to assessors, to those responsible for the selection and development of assessors, and to sponsors of assessments seeking assurance that an assessor is competent to carry out the task.

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Information technology — Software process assessment —

Part 6:
Guide to competency of assessors

1 Scope

This part of ISO/IEC TR 15504 provides guidance for the preparation of assessors to perform software process assessments. It describes mechanisms that may be used to demonstrate assessor competence and to validate an assessor's education, training and experience.

The guidance in this part of ISO/IEC TR 15504 is applicable to an organizational unit or a sponsor of an assessment wishing to select or specify the type of assessors to perform either self-assessments or independent assessments.

The guidance is also applicable to the identification and demonstration of the competencies necessary for the performance of assessments, and to the process of obtaining those competencies.

Guidance on the competence of those who perform process capability determination or process improvement activities is outside the scope of this part of ISO/IEC TR 15504.

2 Normative reference

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC TR 15504. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC TR 15504 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC TR 15504-9:1998, *Information technology — Software process assessment — Part 9: Vocabulary*.

3 Terms and definitions

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

4 An overview of the assessor and competence

4.1 The role of the assessor

The role of the assessor, as described in ISO/IEC TR 15504-4, is to assess the software process of an Organizational Unit in a constructive and an objective manner. The assessment should be focused on the process and not the people implementing the process. The role varies depending on the assessment approach as shown in table 1.

Table 1 — The role of the assessor in different assessment approaches

| Self-assessment approach	Independent assessment approach
Is task and people oriented.	Is task oriented.
Guides the assessment.	Controls the assessment.
Agrees a rating.	Delivers a rating.
Promotes discussion.	Regulates discussion.
Works with projects.	Works separately from projects.
Uses Organizational Unit's business goals.	May be indifferent to Organizational Unit's business goals.
Influences through results obtained, relationships established and expertise.	Influences through position and expertise.
Seeks commitment.	Determines process adequacies.
Is like being a change agent.	Is like being an auditor.
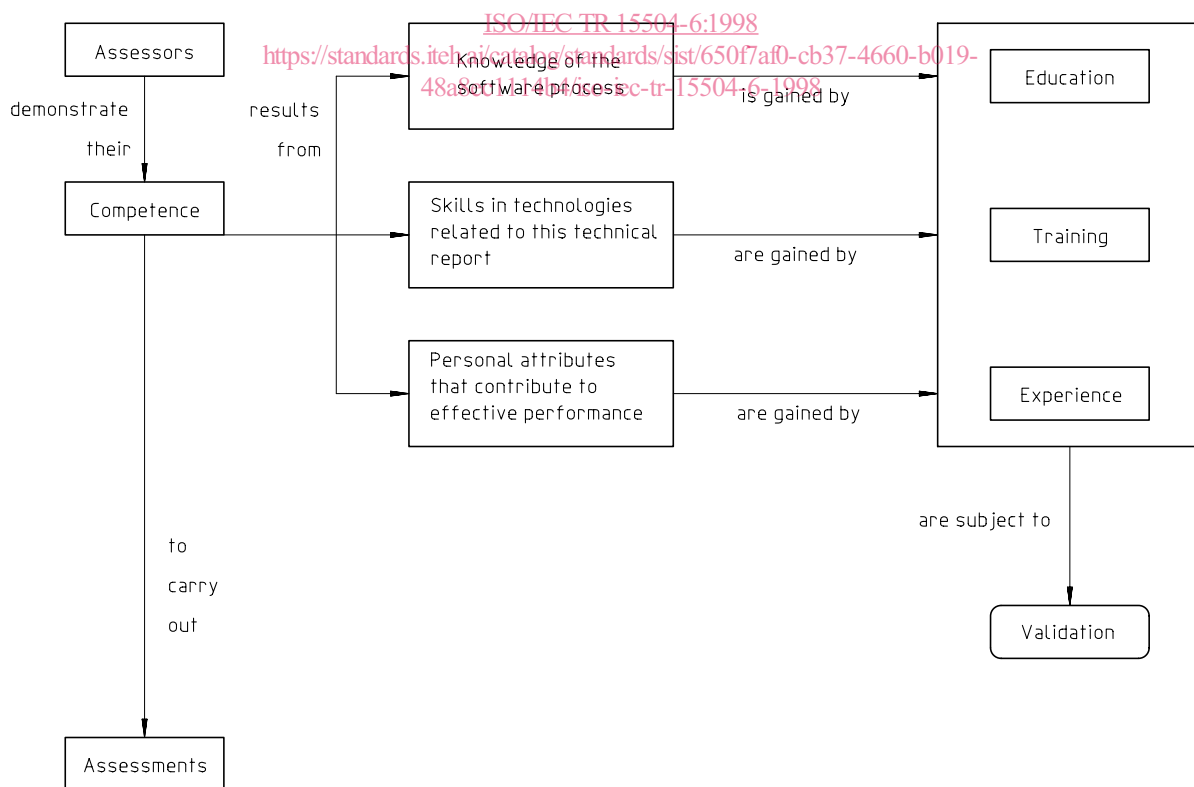
Figure 1 — Entity relationships

4.2 Philosophy

Figure 1 shows the key entities and relationships which may be articulated as follows:

a) assessors demonstrate their competence to carry out assessments;

b) competence results from:

    1) the knowledge of the software process,

    2) skills in the principal technologies of ISO/IEC TR 15504 including: the reference model; assessment models, methods and tools; and rating processes,

    3) personal attributes which contribute to effective performance;

c) the knowledge, skills and personal attributes are gained by a combination of education, training and experience;

d) an alternative to the demonstration of competence is to validate an intending assessor's education, training and experience.

4.3 The process of gaining and maintaining competence

4.3.1 Becoming a provisional assessor

A provisional assessor is a person who has reached the required levels of education, training and experience but who has not necessarily participated in assessments conducted according to the provisions of ISO/IEC TR 15504.

A provisional assessor should be trained and experienced in the software process as well as in software process assessment or software quality assessovisional assessor should have received training that satisfies the guidance of ISO/IEC TR 15504. A provisional assessor should also have evidence of an acceptable level of education. (Education is a combination of general education and software education.)

Acceptable levels of education may comprise:

— courses offered by a college or university;

— professional courses organized by recognized local or international bodies;

— vendor sponsored courses;

— employer sponsored courses.

Acceptable levels of training may comprise:

— training provided by recognized local or international bodies;

— training provided by vendors and trainers based on the guidance in this part of ISO/IEC TR 15504.

Acceptable levels of experience may comprise:

— direct "hands-on" experience in specialist areas such as software engineering, software development/maintenance, software quality, or quality assurance;

— management experience overseeing software specialist areas such as software engineering, software development/maintenance, software quality or quality assurance.

4.3.2 Becoming a competent assessor

To become a competent assessor, one should have participated in assessments conducted according to the provisions of ISO/IEC TR 15504. Competent assessors should maintain a record of ongoing professional activities to demonstrate continuing competencies of skills, knowledge and training. Assessors' professional activities should be recorded (see Annex D and Annex E) for validation.

4.3.3 Maintenance of competence

To maintain their competence, assessors should update their knowledge and skills by engaging in a number of professional activities as well as carrying out further assessments conducted according to the provisions of ISO/IEC TR 15504.

5 Assessor competence

5.1 The software process

An assessor should be familiar with software development and maintenance including various life cycle models and be able to demonstrate competence in at least one of the process categories of the process model described in ISO/IEC TR 15504-2.

An assessor should also be able to demonstrate familiarity with the software process, and should be experienced with the use of one or more development models such as Waterfall or Rapid Prototyping.

In addition, an assessor should show an understanding of the activities required to support the software process, methods and tools, including when and how they should be applied according to the development model chosen within the application domain in which the assessor is experienced.

An assessor should be familiar with a range of relevant software engineering standards.

5.2 Aspects of assessment

Assessors should demonstrate competence in aspects of the assessment pertaining to ISO/IEC TR 15504, particularly the core aspects included in parts 2 to 5 as shown below.

a) Overview of the framework for process assessment

   (ISO/IEC TR 15504-1: *Information technology - Software process assessment - Part 1: Concepts and introductory guide*)

b) The process assessment architecture

   (ISO/IEC TR 15504-2: *Information technology - Software process assessment - Part 2: A reference model for processes and process capability*)

c) Performing process assessment

   (ISO/IEC TR 15504-3: *Information technology - Software process assessment - Part 3: Performing an assessment*, and ISO/IEC TR 15504-4: *Information technology - Software process assessment - Part 4: Guide to Performing assessments*)

d) Compatible assessment models

   (ISO/IEC TR 15504-5: *Information technology - Software process assessment - Part 5: An assessment model and indicator guidance; or other compatible model*)

e) Relevant software standards

5.3 Personal attributes

5.3.1 General

Figure 2 — Personal attributes

Assessors should possess the personal attributes shown in figure 2 and described below. Their functional and hierarchical position relative to the Organizational Unit should allow them to take advantage of these attributes.

5.3.2 Effective written and verbal communication

Assessors who perform assessments will interact with members of the organizational unit being assessed. They may be feeding back the results of the assessment in the form of written reports and/or presentations. Assessors should be able to communicate the findings of the assessments in a clear, non-judgmental style. Assessment findings should be documented in clear and unambiguous language.

5.3.3 Diplomacy

Assessors should act with professionalism and decorum at all times. Independent assessors are guests of the organizational unit being assessed and their conduct should be above reproach at all times.

5.3.4 Discretion

Assessors should develop and maintain the confidence of the assessment participants. In particular, assessors should preserve the confidentiality of the results of the assessment and of information received during an assessment in accordance with the terms of any confidentiality agreement included in the assessment constraints (see ISO/IEC TR 15504-3 and ISO/IEC TR 15504-4).

5.3.5 Persistence and resistance handling ability

Assessors should be persistent in carrying out the duties that are expected of them. They should be able to resolve any conflicts and handle any resistance that they may experience from assessment participants.

5.3.6 Judgment and leadership

It is critical that the Organizational Unit being assessed has confidence in, and respect for individual assessment team members. If they are not respected within the Organizational Unit, then the assessment findings may not be accepted by the organizational unit.

5.3.7 Integrity

The assessment team leader, team coordinator and team members should have no conflict of interest in performing the assessment. For example, the risks should be considered including as team members' managers who evaluate the performance of individuals involved in a project being assessed.

5.3.8   Rapport

Individuals who might stifle the open and honest flow of information because of their organizational position or personality should not participate in the assessment. Assessors should create an open and honest spirit of communication between people so that project personnel will freely discuss issues.

6.1 Overview

Validation of an assessor's education, training and experience is an alternative to the demonstration of competence. The education, training and experience may be validated by a review of these elements. The right balance is of prime importance. In general terms, the balance includes general education and software education together with a combination of training and experience in both software development activities and assessments, including those that are conducted according to the provisions of ISO/IEC TR 15504.

The following factors should be considered when reviewing the education, training and experience of an assessor.

Duration: The amount of time the assessor has spent in a particular process category. (See ISO/IEC TR 15504-2 for process categories).

Range: The assessor's breadth of exposure to the process categories.

Depth: The level of specialization.

Responsibility: The extent to which an assessor has held responsibility in terms of both range and depth.

Currency: How recent is the assessor's education, training and experience, and the extent to which the assessor's knowledge and skill have been updated.

6.2 Education

Assessors should maintain documented evidence of their education in terms of certificates and course outlines for validation. The following levels of educational achievement may be considered as appropriate in the categories of general education and software education.

General education: A degree or equivalent in any discipline from an educational establishment.

Software education: A degree or equivalent in Computer Science, Software Engineering or a similar discipline.

6.3 Training

6.3.1   General

An assessor's training should be recorded (see Annex A) for validation.

Acceptable training would cover at least some aspects of software development.

In order to be familiar with software development and maintenance processes, the assessor should have been trained, or have documented experience, in all the processes in the Engineering (ENG) process category.

Project management or technical leadership training provides a background in the Customer Supplier (CUS) and the Organizational (ORG) process categories. Assessors need not have been trained in each process in the two process categories, but should be familiar and conversant with the topics. Assessors should have extensive training in at least one of the processes in these two process categories.

6   Validation of education, training and experience