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Information technology — Process assessment — Process assessment model for software testing

Technologies de l'information — Évaluation du procédé — Modèle d'évaluation du procédé pour l'essai de logiciel

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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 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 7, *Software and systems engineering*.

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Introduction

The ISO/IEC 330xx set of standards covering the domain of process assessment are based on a view of assessment that establishes architecture of the following three components:

— process models that define processes, the entities that are the subject of assessment;

— measurement frameworks that provide scales for evaluating specified attributes;

— a specification of the process to be followed in conducting assessments.

This International Standard provides an example of a process assessment model for software testing for use in performing a conformant assessment in accordance with the requirements of ISO/IEC 33002.

An integral part of conducting an assessment is to use a process assessment model (PAM) related to a process reference model (PRM) and conformant with the requirements defined in ISO/IEC 33004.

A process reference model cannot be used alone as the basis for conducting a consistent and reliable assessment of process capability since the level of detail is not sufficient. Therefore,

— the description of the process purpose and process outcome(s) provided by the process reference model needs to be supported with a comprehensive set of indicators of process performance, and

— the capability levels and process attributes defined in ISO/IEC 33020 and its associated rating scale need to be supported with a set of indicators of process capability.

Used in this way and in conjunction with a documented process, consistent and repeatable ratings of process capability is possible.

This International Standard, a process assessment model for software testing, contains a set of indicators to be considered when interpreting the intent of the process reference model. These indicators may also be used when implementing a process improvement program or to help evaluate and select an assessment model, methodology, and/or tools.

The process reference model defined in ISO/IEC/IEEE 29119-2 has been used as the basis for the ISO/IEC 33063 exemplar process assessment model for software testing.

The following are provided within this International Standard:

— Clause 4 provides a detailed description of the structure and key components of the process assessment model, which introduces the following two dimensions: a) process dimension; b) capability dimension. Assessment indicators are also introduced in this Clause;

— Clause 5 addresses the process dimension. It uses process definitions from ISO/IEC/IEEE 29119-2 to identify a process reference model. The processes of the process reference model are described in the process assessment model in terms of purpose and outcomes. The process assessment model expands the process reference model process definitions by including a set of process performance indicators called base practices for each process. The process assessment model also defines a second set of indicators of process performance by associating work products with each process;

— Clause 6 addresses the capability dimension. It duplicates the definitions of the capability levels and process attributes from ISO/IEC 33020 and expands each of the attributes through the inclusion of a set of generic practices. These generic practices belong to a set of indicators of process;

— Annex A provides a statement of conformance of the process assessment model for software testing to the requirements defined in ISO/IEC 33004;

— Annex B provides a guideline on how the planning and scoping of an assessment is done with this process assessment model for software testing;

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NOTE As the processes described in this model are generic when practically applied to an assessment, they have to be applied to the different test phases or test levels or test types encountered in the project which is to be assessed. The multiple applications of the processes have to be documented in the assessment scope. It also provides guideline on the use of additional processes from other process assessment models.

— Annex C provides selected characteristics for typical work products to assist the assessor in evaluating the capability level of processes;

— Annex D introduces additional process areas for the process assessment model;

— Annex E provides the additional process reference model processes which will be used by the PAM in Annex D;

— Bibliography contains a list of informative references.

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Information technology — Process assessment — Process assessment model for software testing

1 Scope

This International Standard

— defines a process assessment model that meets the requirements of ISO/IEC 33004 and that supports the performance of an assessment of process capability using the process measurement framework defined in ISO/IEC 33020. The process assessment model provides indicators for guidance on the interpretation of the process purposes and outcomes as defined in ISO/IEC/IEEE 29119-2 and the process attributes as defined in ISO/IEC 33020, and

— provides guidance, by example, on the definition, selection, and use of assessment indicators.

A process assessment model comprises a set of indicators of process performance and process capability. The indicators are used as a basis for collecting the objective evidence that enables an assessor to assign ratings, following the requirements of ISO/IEC 33002. The set of indicators included in this International Standard is not intended to be an all-inclusive set nor is it intended to be applicable in its entirety. Subsets that are appropriate to the context and scope of the assessment should be selected.

The process assessment model in this International Standard is directed at assessment sponsors and competent assessors who wish to select a model and associated documented process method for assessment (for either capability determination or process improvement).

Any process assessment model for software testing meeting the requirements defined in ISO/IEC 33004 concerning models for process assessment may be used for assessment. Different models and methods might be needed to address differing business and testing needs. This assessment model is provided as an exemplar of a model meeting all the requirements expressed in ISO/IEC 33004.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC/IEEE 29119-1, *Software and systems engineering — Software testing — Part 1: Concepts and definitions*

ISO/IEC/IEEE 29119-2, *Software and systems engineering — Software testing — Part 2: Test processes*

ISO/IEC 33001, *Information technology — Process assessment — Concepts and terminology*

ISO/IEC 33004, *Information technology — Process assessment — Requirements for process reference, process assessment and maturity models*

ISO/IEC 33020, *Information technology — Process assessment — Process measurement framework for assessment of process capability*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 33001, ISO/IEC/IEEE 29119-1, and ISO/IEC/IEEE 29119-2 apply.

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4 Overview of the process assessment model

4.1 General

ISO/IEC 33063 provides an exemplar Process assessment model (PAM) for software testing that includes examples of assessment indicators.

The process reference model (PRM) defined in ISO/IEC/IEEE 29119-2, together with the process attributes defined in ISO/IEC 33020, establish the process assessment model used as a common basis for performing assessments of software testing process capability, allowing for the reporting of results using a common rating scale.

The process assessment model is a two-dimensional model of process capability. In one dimension, the process dimension, the processes are defined and classified into process categories. In the other dimension, the capability dimension, a set of process attributes grouped into capability levels is defined. The process attributes provide the measurable characteristics of process capability.

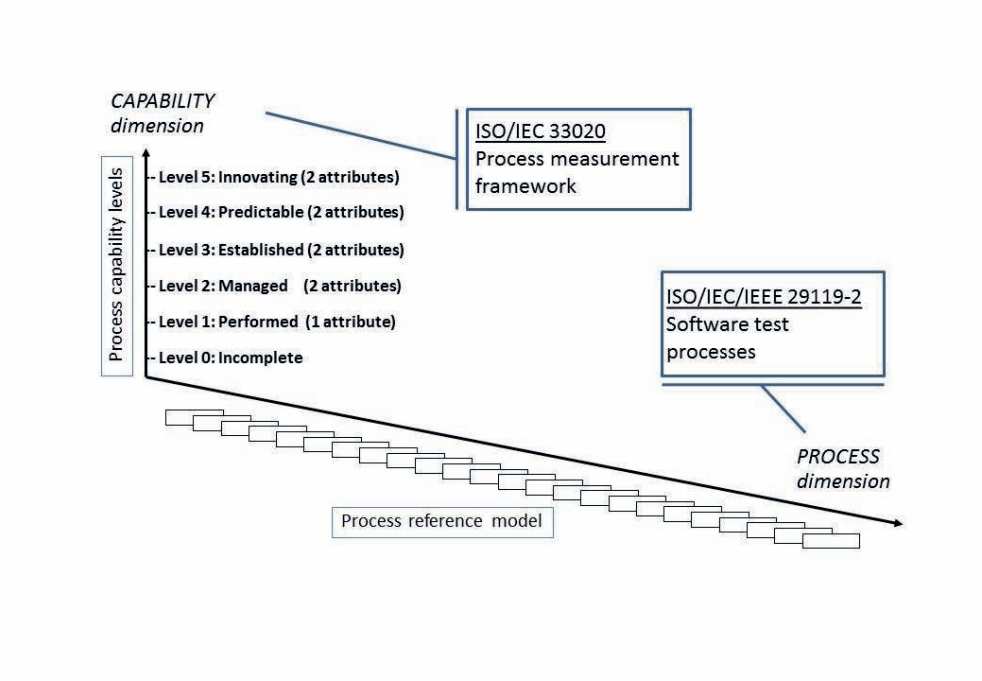


Figure 1 — Relationship between the process assessment model and its inputs

Figure 1 shows the relationship between the general structure of the process assessment model, ISO/IEC 33020 and ISO/IEC/IEEE 29119-2.

The process reference model and the capability dimension defined in ISO/IEC 33020 cannot be used alone as the basis for conducting reliable and consistent assessments of process capability since the level of detail provided is not sufficient. The descriptions of the process purpose and outcomes in the process reference model, and the process attribute definitions in ISO/IEC 33020, need to be supported with a comprehensive set of indicators of process performance and process capability that are used for assessment performance.

The exemplar process assessment model for software testing defined in ISO/IEC 33063 is conformant with the ISO/IEC 33004 requirements for a process assessment model, and can be used as the basis for conducting an assessment of software testing process capability.

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