INTERNATIONAL STANDARD

ISO/IEC 33071

First edition
2016-10-15

Information technology — Process assessment — An integrated process capability assessment model for Enterprise processes

Technologies de l'information — Évaluation des processus — Modèle d'évaluation de la capacité des processus intégrés pour les processus d'entreprise

Reference number
ISO/IEC 33071:2016(E)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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).

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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO/IEC 33071 was prepared by SPICE User Group and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

About Enterprise SPICE

The process community recognized the need for an integrated standards-based enterprise process assessment model and requested an international activity to develop such a model. The initiative was first proposed and discussed at SPICE 2006 conference in Luxembourg and formally launched at SPICE 2007 conference in Seoul, Korea.

A call for participation resulted in the community signing up to support the project in various roles (e.g. advisory board member, author, reviewer, and assessor). Over 120 project team members from 31 different countries participated in developing the Enterprise SPICE integrated process assessment model for enterprise processes (Enterprise SPICE process assessment model).

The Enterprise SPICE project is hosted by the SPICE User Group, and it is governed by a 15 member Advisory Board voted in by the project stakeholders every two years. The Advisory Board has reserved seats for representatives from various geographical regions, for the SPICE User Group, and for the SPICE Academy. The Enterprise SPICE project is guided by the Enterprise SPICE strategy, which identifies goals, objectives and activities, and is led by an International Project Leader who coordinates several authoring teams. A charter governs the working of the Advisory Board.

The Enterprise SPICE process assessment model was developed and released in review cycles. In 2008, the project team developed the draft process reference model, providing a description of the proposed architecture/high-level relationship of processes, the names, purposes, and outcomes for those processes, and a list of the sources and references integrated to develop each process. All process reference model review comments were adjudicated, and accepted comments were included in the next major review cycle which provided a draft process assessment model. This 2009 release of the process assessment model elaborated the process reference model with indicators (base practices and work products), a new section on relationship notes, plus a detailed mapping table for all processes indicating the sources and references integrated at the purpose, outcome, and base practice level. All comments were adjudicated by the project team and approved comments are reflected in *Enterprise SPICE® An Integrated Model for Enterprise-wide Assessment and Improvement, Technical Report – Issue 1*, The Enterprise SPICE Project Team, September 2010. This document which provides an integrated process capability assessment model for enterprise processes is based on that Technical Report.

The public website for information about the Enterprise SPICE project is: www.enterprisespice.com.

Introduction

This document provides an integrated process capability assessment model for enterprise processes (process assessment model) that integrates and harmonizes selected process models and standards into a single enterprise improvement model. By bringing together best practices from several disciplines and several models and standards into a comprehensive improvement model, this document provides an efficient effective mechanism for assessing and improving processes deployed across a typical, large or small, enterprise.

This document provides the following benefits to stakeholders:

— **Single Unified Model**: the model integrates practices from the widely recognized standards and sources of best practice; no need to use many separate standards and models concurrently - they are consolidated into a single unified model

— **Pick and Choose**: select from the model those areas relevant to your business needs

— **Authoritative**: provides best guidance available drawn from widely recognized standards and sources, with detailed mapping tables tracing each practice to sources if further information is desired/required

— **Comprehensive**: addresses a broad, and expanding, range of disciplines

— **Synergized:** the sources are integrated, harmonized, and synergized; each source contributes important perspectives

— **Reduced Costs:**

  — Training on one model, not several

  — Improvement using one model, not several, leading to simultaneous improvement vs. all sources; compliant processes address best practice from multiple standards concurrently

  — Avoids duplication of effort

  — Appraisals vs. one model, not several, leading to simultaneous multiple ratings/ certification if desired, assuming required assessment practices are followed

— **Enhanced Effectiveness via Integrated Guidance:**

  — For all levels from enterprise to team processes

  — For large or small business units

  — Across disciplines for multidisciplinary teams

  — Aligns business and technical processes

  — Across all product and service life cycle phases/activities

  — Improvement initiatives can be aligned across the enterprise

— **Conformity Assessment**: conformity assessment services from accredited bodies.

This document can be used by any enterprise or organization that seeks to improve its business performance in an integrated way. Both large and small enterprises can use the model and reap the benefits outlined above. Individuals can use the model to get an overview of best practices and to understand how various standards and models fit together.

Information technology — Process assessment — An integrated process capability assessment model for Enterprise processes

1 Scope

This document defines an integrated process assessment model for enterprise processes (process assessment model) for use in performing a conformant assessment of process capability in accordance with the requirements of ISO/IEC 33002.

The process assessment model integrates and harmonizes existing standards, as determined by stakeholders, and provides in a single document a process reference model and process assessment model that addresses broad enterprise processes and which provide an efficient and effective mechanism for assessing and improving processes deployed across an enterprise.

NOTE: **Copyright release:** Users of this document may reproduce subclauses 6.1 to 6.5 and 7.1 to 7.2 as part of any tool or other material to support the performance of process assessments, so that it can be used for its intended purpose.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 33001:2014, *Information technology — Process assessment — Concepts and terminology*

ISO/IEC 33004:2014, *Information technology — Process assessment — Requirements for process reference, process assessment and maturity models*

ISO/IEC 33020:2014*, 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 and ISO/IEC 33020 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:
— IEC Electropedia: available at http://www.electropedia.org/
— ISO Online browsing platform: available at http://www.iso.org/obp

4 General

The Enterprise SPICE process assessment model which forms the basis for this integrated process capability assessment model for enterprise processes (process assessment model) was built on an existing baseline enterprise model, the Federal Aviation Administration (FAA) integrated Capability Maturity Model® (iCMM®)

v2.0, which integrated a set of disciplines and source standards/models. Additional disciplines and sources were identified via a formal survey of stakeholders. These were then vetted against a set of criteria and a smaller set chosen for integration into the Enterprise SPICE process assessment model.

Criteria for discipline selection

- **Priority** criticality, importance or urgency for inclusion (should this be in first release (high), next set of disciplines (medium), sometime in future (low)?)
- **Relevance** to enterprise operations and success (how relevant is this to your business?)
- **Perceived need, value or risk reduction** for including this discipline in enterprise assessments (does this discipline need to be assessed? will risks to enterprise success be reduced by including this discipline? how valuable to the enterprise will assessments be with respect to this discipline?)
- **Existence/maturity** of process standards and best practices in the discipline (does this discipline have mature best practices?)
- **Compliance** requirements regarding these disciplines in stakeholder enterprises (do you need to comply with requirements regarding this discipline?)

Criteria for source material selection

- Only major, essential, widely-recognized process standards/models/documents should be selected as source* documents (others may be useful reference** documents).
- The number of sources for a discipline should be limited to 3 to 5 for a given area.
- Process source documents should be generic rather than method specific improvement approaches (i.e. sources indicate what, not how).

* Source documents are documents from which the process descriptions are derived. Mapping of the processes to source practices is required, along with coverage of source documents, at an appropriate level of detail.

** Reference documents are documents identified as useful in developing best practice in certain areas, but full coverage and detailed mapping are not required.

The Enterprise SPICE process assessment model addresses the following disciplines by integrating the following sources.

Disciplines: enterprise management, investment management, general management, service management, human resource management, acquisition, quality management systems, full lifecycle engineering for products and services, knowledge management, environment, safety and security, and core supporting disciplines

Sources: FAA-iCMM (baseline model, integrating ISO 9001, ISO/IEC 12207, ISO/IEC 15288, ISO/IEC 15504, Malcolm Baldrige National Quality Award, CMMI®, EIA 731, previous CMMs, MIL-STD-882C, MIL-STD-882D, IEC 61508: DEF STAN 00-56, ISO 17799, ISO 15408, ISO/IEC 21827, NIST 800-30); plus: ITIL®; ISO/IEC 20000; CobIT®; People-CMM (P-CMM®); ITIM, ISO 14000. Additional references include ISO 31000, eSCM-CL, eSCM-SP, PMI Standard for Portfolio Management, PMBOK, and FEA Practice Guidance.

See Bibliography for a full description of all the above sources and references.

5 Process assessment model architecture

5.1 Two dimensional model

This process assessment model is structured as a two-dimensional model of process capability containing a process dimension and a capability dimension.

The process dimension includes the process descriptions, purpose and outcomes of the processes from a process reference model. This process assessment model provides the defined process reference model as an integral part the process dimension in the process assessment model.

The capability dimension includes a set of process capability levels and process attributes. A process attribute is a feature of a process that can be evaluated on a scale of achievement, providing a measure of the capability of any process. The capability dimension of this process assessment model incorporates the measurement framework for process capability as defined in ISO/IEC 33020 for process Capability Levels 0 and 1.

Note that this process assessment model is a process capability model, not an maturity model, and does not describe staging or ordering of processes or practices.

This process assessment model expands upon the process reference model and process measurement framework for assessing process by including a defined set of assessment indicators. Assessment indicators comprise indicators of process performance and process capability and are defined to support an assessor’s judgment of the performance and capability of an implemented process.

ISO/IEC 33004 specifies requirements for conformance of process reference models and process assessment models. Statements of conformance of the process reference model and the process assessment model to ISO/IEC 33004 requirements are provided in Annex A: Conformity of the process reference model and process assessment model with ISO/IEC 33004 Requirements.

There are 29 processes in the model which are grouped into three Process Categories and one Special Applications Area. The process categories and special application area are described below.

Governance/Management Process Category	The governance/management category includes processes that govern the enterprise and manage the business. These processes set vision and direction and oversee execution of other processes. They can be used at the enterprise, project or team level. Included in this category are processes that establish and manage relationships and partnerships among business owners, acquirers, and suppliers.
Life Cycle Process Category	The life cycle category includes processes that develop, deploy, operate and maintain a product or service to meet customer needs. These processes cover the typical life cycle of a product or service, from inception to disposal.
Support Process Category	The support category includes processes that are used by other processes when needed, and contribute to the success and quality of all the processes.
Special Applications Area	The special “application areas” provide ways of applying the processes in a particular context. The practices, called “application practices”, are implemented by using other processes in the context of the special application of the model. This new construct facilitates the re-use of the model without recreating processes that are already well established.

Each process is defined in terms of a process purpose statement and process outcomes. The process purpose statements contain the unique functional objectives of the process when performed in a particular environment. The process outcomes associated with each of the process purpose statements is a list of expected positive results of the performance of the processes.

5.2 Assessment indicators

The process assessment model is based on the principle that the capability of a performed process can be assessed by demonstrating the achievement of process attribute on the basis of evidence related to assessment indicators.

There are two types of assessment indicators: process capability indicators, and process performance indicators.

The process attribute in the capability dimension has a set of process capability indicators that provide an indication of the extent of achievement of the attribute in the instantiated process. These indicators concern significant activities, resources or results associated with the achievement of the attribute purpose by a process.

The process capability indicators are:

— Generic Practice (GP);

— Generic Resource (GR);

— Generic Work Product (GWP).

Each process in the process dimension has a set of process performance indicators which are used to support the measure of the degree of achievement of the process performance attribute for the process assessed.

The process performance indicators are:

— Base Practice (BP);

— Work Products (WP).

The performance of base practices provides an indication of the extent of achievement of the process purpose and process outcomes. Work products both input and output are either used or produced (or both), when performing the process.

The process performance and process capability indicators defined in the process assessment model represent types of objective evidence that might be found in an instantiation of a process and therefore could be used to judge achievement of capability.

6 The process dimension and process performance indicators

6.1 General

This clause defines the processes and the process performance indicators, also known as the process dimension, of the process assessment model.

The process dimension includes process reference model elements (purpose and outcomes) plus process assessment model elements related to process performance indicators (base practices and work products). Additionally, it includes for each process a set of relationship notes.

The individual processes are described in terms of process ID, process name, process purpose, and process outcomes:

Process ID: This is a process category identifier, followed by a sequential number assigned to process descriptions within that category.

Process name: This is the name given to the process.

Process purpose: This is a statement of the purpose of the process.

Process outcomes: These are the outcomes expected as a result of successful implementation of the process.

In addition, the process dimension provides information in the form of:

Base practices: A set of base practices are identified by appending sequential numbers to the Process ID, followed by the practice name, followed by the practice description. Each base practice description indicates the outcome(s) addressed by the practice.

Relationship notes: Relationship notes are used to describe how the processes are related. Relationships can be of various forms, such as providing input to another process, receiving output from another process, indicating general relationships for clarification purposes, or describing when another process might be used in relation to carrying out the process being described.

Work products: Work products are provided as both input work products and output work products, each are associated with related outcome(s). They are only examples and are not intended to be prescriptive. Nor do they necessarily list all possible input or output work products. The identification of example work products is intended to help the enterprise when defining their own processes, to provide clarification for interpretation of the outcomes and base practices in the model, and to help assessors regarding potential artifacts to look for when assessing a particular process.

Work products are further used to clarify relationships between processes. For example, an input work product may be provided by a producer outside the scope of the model (such as a customer, or an external legal requirement imposed on the enterprise), or it may be provided from another process within the model. In the latter case, this relationship is noted by Relationship notes and also in Annex C: Relationship Tables which captures all such relationships. Output work products similarly fall in different categories. Some are supplied to other processes in the model, and denoted as such in Relationship notes and Annex C: Relationship Tables. Other outputs are used as records indicating achievement of outcomes and purpose.

Informative notes are provided for any of the above elements, as appropriate.

Sources and mapping: Each process description has been mapped to the source and reference documents that were brought together to derive the purpose, outcomes, and base practices. The sources and references used in developing the process descriptions are described in the Bibliography, and the specific elements integrated to derive the process descriptions are included in Annex D: High Level Mapping Tables.

Note that Annex B: Application and use of the process assessment model provides information on its use in relation to its sources.

The processes are listed below with their process ID and process name grouped into the process categories and special application area.

Figure 1 —Processes Grouped by Process Categories and Special Application Area

Governance/Management Process Category
GVM.1 Enterprise Governance GVM.2 Investment Management GVM.3 Human Resource Management GVM.4 Enterprise Architecture GVM.5 Business Relationship Management GVM.6 Supplier Agreement Management GVM.7 Tendering GVM.8 Project Management GVM.9 Risk Management
Life Cycle Process Category
LFC.1 Needs LFC.2 Requirements LFC.3 Design

LFC.4 Design Implementation LFC.5 Integration LFC.6 Evaluation LFC.7 Operation and Support LFC.8 Deployment and Disposal
Support Process Category
SUP.1 Alternatives Analysis SUP.2 Measurement and Analysis SUP.3 Quality Assurance and Management SUP.4 Change and Configuration Management SUP.5 Information Management SUP.6 Knowledge Management SUP.7 Training SUP.8 Research and Innovation SUP.9 Work Environment SUP.10 Process Definition SUP.11 Process Improvement
Special Applications Area
SAP.1 Safety and Security

6.2 Governance/Management Category

6.2.1 Enterprise Governance

Process ID	GVM.1
Process name	Enterprise Governance
Process purpose	The purpose of the Enterprise Governance process is to establish strategic enterprise direction and ensure the enterprise achieves its goals and objectives. NOTE: This process provides enterprise and corporate governance.
Process outcomes	As a result of successful implementation of the Enterprise Governance process: 1) Vision, mission, values, performance goals, objectives, and targets are established, maintained, and communicated to all employees and stakeholders. 2) Enterprise policies and directives are established, maintained, and communicated to all employees and stakeholders. 3) The organization is structured and aligned to operate in order to achieve the vision, goals, and objectives. 4) Employees share a common vision, culture, and understanding of enterprise goals and objectives and their role in achieving them. 5) Strategies are developed, budgets are formulated and aligned to strategic goals, and actions to achieve goals and objectives are established and reviewed. 6) Societal impacts, regulatory and legal requirements, environmental impacts, and risks are recognized and addressed when operating the enterprise.

	7) Employees and stakeholders are informed about enterprise performance.
Base practices	**GVM.1.BP1: Establish and Maintain Strategic Vision.** Establish, maintain, and communicate a strategic vision that identifies long-term goals, values, performance expectations, and core activities. [Outcome: 1] **GVM.1.BP2: Establish and Maintain Policies.** Establish, maintain and communicate policies and directives. [Outcome: 2] **GVM.1.BP3: Align to Achieve the Vision.** Align the enterprise to operate in order to achieve the vision. Establish leadership systems, control systems and structures for decision making, empowerment, compliance and conflict resolution. Provide incentives for contributing to enterprise vision and strategy. Provide consequences for contravening enterprise directives and policies. [Outcome: 3] **GVM.1.BP4: Ensure sharing of common culture and vision.** Ensure that individuals in the enterprise share a common culture, understand the common vision, and are committed and empowered to perform their functions effectively. [Outcome: 4] **GVM.1.BP5: Establish and Maintain Strategy**. Establish and maintain the enterprise strategic plans that identify business objectives to be achieved, areas of business to be pursued and their interrelationships, and the significant goals to be accomplished. [Outcome: 5] **GVM.1.BP6: Formulate and Align Enterprise Budgets**. Formulate enterprise budgets to ensure alignment with strategic goals. Ensure congruency with action plans. [Outcome: 5] **GVM.1.BP7: Develop and Deploy Action Plans**. Establish, integrate, and deploy tactical action plans to accomplish enterprise business objectives. [Outcome: 5] **GVM.1.BP8: Review Performance**. Review performance relative to goals and changing needs across the enterprise. [Outcome: 5] NOTE: Performance review information is provided by related management levels, as appropriate. **GVM.1.BP9: Act on Results of Review**. Translate performance review findings into action plans. [Outcome: 5] **GVM.1.BP10: Fulfil Public Responsibility**. Address the impacts on society and the environment of planned activities, products, services, and operations, considering regulatory and legal requirements and risks associated with products, services, and operations. Ensure corporate social responsibility, and take specific actions to address relevant findings. [Outcome: 6] **GVM.1.BP11: Inform Employees Regarding Enterprise Performance.** Regularly inform employees and stakeholders regarding enterprise performance [Outcome: 7]
Relationship notes	NOTE 1: The Investment Management process manages the portfolio of enterprise investments to align with achievement of enterprise goals and objectives. NOTE 2: The Measurement and Analysis process supports the establishment