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Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality measurement framework

*Ingénierie des systèmes et du logiciel — Exigences de qualité du
produit logiciel et évaluation (SQuaRE) — Modèle de référence de
mesure et guide*



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.

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

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

This second edition cancels and replaces the first edition (ISO/IEC 25020:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

- relationships among different types of quality measures have been added;
- application of measurement results and description of quality measure have been added;
- elements for documenting quality measures in [Annex C](#) have been supplemented and categorized;
- [Annex D](#) has been added showing a normalized measurement function for QMs;
- [Annex E](#) has been added showing the measurement information model in ISO/IEC/IEEE 15939;
- harmonized with ISO/IEC 25000:2014, ISO/IEC 25022:2016, ISO/IEC 25023:2016, ISO/IEC 25024:2015 and ISO/IEC/IEEE 15939:2017.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at <https://www.iso.org/members.html>.

Introduction

0.1 General

This document is a part of the SQuaRE series of International Standards. It provides a framework for measuring the quality characteristics and sub-characteristics (defined in ISO/IEC 2501n). This document serves as a guideline for developing and selecting quality measures for quality in use (in conjunction with ISO/IEC 25022), system and software product quality (in conjunction with ISO/IEC 25023), data quality (in conjunction with ISO/IEC 25024) and IT service quality (in conjunction with ISO/IEC TS 25025¹⁾).

0.2 Quality measurement division

This document is a part of ISO/IEC 2502n Quality Measurement Division of the SQuaRE series that consists of the following International Standards:

- ISO/IEC 25020 — *Quality measurement framework*: provides a framework for developing quality measurement;
- ISO/IEC 25021 — *Quality measure elements*: provides a format for specifying QMEs (Quality Measure Elements) and a few examples of QMEs that can be used to construct software quality measures;
- ISO/IEC 25022 — *Measurement of quality in use*: provides measures, including associated measurement functions for the quality characteristics in the quality in use model;
- ISO/IEC 25023 — *Measurement of system and software product quality*: provides measures, including associated measurement functions and QMEs for the quality characteristics in the product quality model;
- ISO/IEC 25024 — *Measurement of data quality*: provides measures, including associated measurement functions and QMEs for the quality characteristics in the data quality model;
- ISO/IEC TS 25025 — *Measurement of IT service quality*: provides measures for the IT service quality model.

[Figure 1](#) shows the relationship between this document and other standards in the ISO/IEC 2502n division.

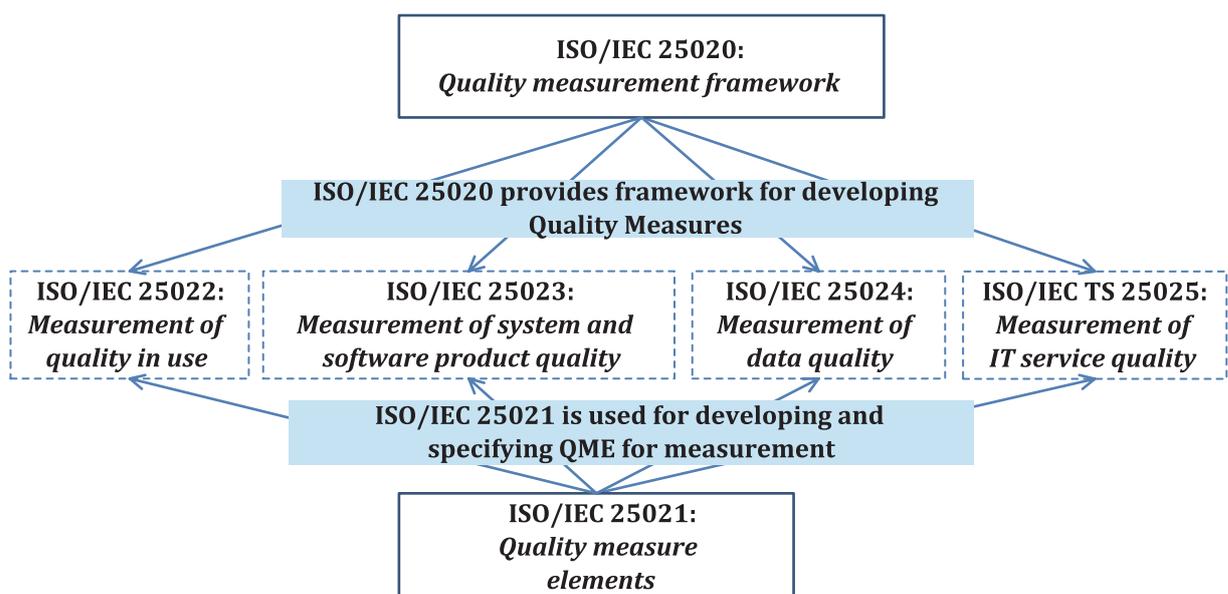


Figure 1 — Structure of the Quality Measurement Division

1) To be developed.

0.3 Outline and organization of the SQuaRE series

The SQuaRE series consists of five main divisions and one extension division. The outlines of each division within the SQuaRE series are as follows.

- **ISO/IEC 2500n - Quality Management Division.** The standards comprising this division define all common models, terms and definitions referred further by all other standards in the SQuaRE series. The division also provides requirements and guidance for the planning and management of a project.
- **ISO/IEC 2501n - Quality Model Division.** The standards comprising this division present quality models for system/software products, quality in use and data. The IT service quality model is published as a Technical Specification.
- **ISO/IEC 2502n - Quality Measurement Division.** The standards comprising this division include a system/software product quality measurement reference model, definitions of quality measures, and practical guidance for their application. This division presents QMs on internal and external property of a system and software product, QMs for quality in use, QMs for data quality and QMs for IT service. Quality measure elements forming the foundations of the quality measures are defined and presented.
- **ISO/IEC 2503n - Quality Requirements Division.** The standards comprising this division help specify quality requirements. These quality requirements can be used in the process of quality requirements elicitation for a system/software product to be developed, designing a process for achieving necessary quality, or as inputs for an evaluation process.
- **ISO/IEC 2504n - Quality Evaluation Division.** The standards comprising this division provide requirements, recommendations and guidelines for system/software product evaluation, whether performed by independent evaluators, acquirers or developers. The support for documenting a quality measure as an Evaluation Module is presented as well.
- **ISO/IEC 25050-25099 - SQuaRE Extension Division.** These standards are reserved for SQuaRE extension International Standards, which currently include ISO/IEC 25051 and ISO/IEC TR 25060 to ISO/IEC 25069.

Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality measurement framework

1 Scope

This document provides a framework for developing quality measurement.

The contents of this document are as follows:

- quality measurement reference model;
- relationships among different types of quality measures;
- guidelines for selecting quality measures;
- guidelines for constructing quality measures;
- guidelines for planning and performing measurements;
- guidelines for the application of measurement results.

It includes considerations for selecting quality measures and quality measure elements ([Annex A](#)), assessing the reliability of measurement and the validity of quality measures ([Annex B](#)), elements for documenting quality measures ([Annex C](#)), normalized measurement function for quality measures ([Annex D](#)) and the measurement information model in ISO/IEC/IEEE 15939 ([Annex E](#)).

This document can be applied for designing, identifying, evaluating and executing the measurement model of system and software product quality, quality in use, data quality and IT service quality. This reference model can be used by developers, acquirers, quality assurance staff and independent evaluators—essentially by people responsible for specifying and evaluating the quality of information and communication technology (ICT) systems and services.

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/IEEE 15939, *Systems and software engineering — Measurement process*

ISO/IEC 25000, *Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guide to SQuaRE*