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Information technology — Systems and software Quality Requirements and Evaluation (SQuaRE) — Measurement of IT service quality

Technologies de l'information — Exigences de qualité et évaluation des systèmes et du logiciel (SQuaRE) — Mesure de la qualité du service informatique



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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.

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 or www.iec.ch/members_experts/refdocs).

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) or the IEC list of patent declarations received (see patents.iec.ch).

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

For an explanation of the voluntary nature of standards, 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. In the IEC, see www.iec.ch/understanding-standards.

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

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 www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

0.1 General

This document is a part of the Systems and software Quality Requirements and Evaluation(SQuaRE) series of documents, which provides a set of measures for the quality characteristics of IT service that are defined in ISO/IEC TS 25011. It can be used for specifying requirements, measuring and evaluating the IT service quality, in conjunction with other SQuaRE series of documents.

The set of quality measures in this document are selected based on their practical value. They are not intended to be exhaustive, therefore users of this document are encouraged to refine them if necessary.

0.2 Quality measurement division

This document is a part of the ISO/IEC 2502n division that currently consists of the following documents:

— ISO/IEC 25020 — Quality measurement framework: provides a reference model and guideline for measuring the quality characteristics defined in ISO/IEC 2501n quality model division.

— ISO/IEC 25021 — Quality measure elements: provides a format for specifying quality measure elements and some examples of quality measure elements 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 for the quality characteristics in the product quality model.

— ISO/IEC 25024 — Measurement of data quality: provides measures including associated measurement functions for the quality characteristics in the data quality model.

— ISO/IEC TS 25025 — Measurement of IT service quality: provides quality measures useful for requirements and evaluation of IT service quality.

Figure 1 depicts the relationship between this document and the other documents in the ISO/IEC 2502n division.

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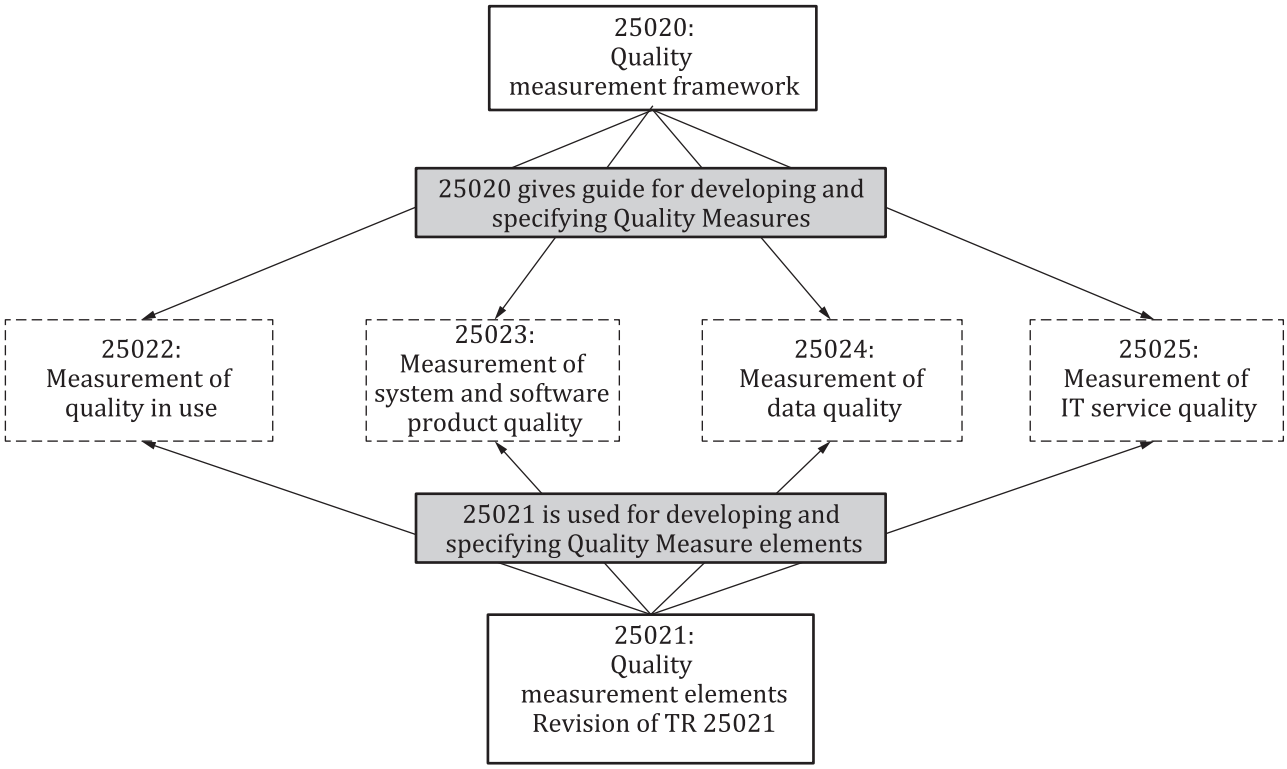


Figure 1 — Structure of the quality measurement division

0.3 Outline and organization of SQuaRE series

The SQuaRE series consists of five main divisions and an extension division. An outline of each division within the SQuaRE series is as follows:

— ISO/IEC 2500n — Quality management division. The standards that form this division define all common models, terms and definitions referred further by all other standards from 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 that form this division provide quality models for system/software products, quality in use, data and IT service. Practical guidance on the use of the quality model is also provided.

— ISO/IEC 2502n — Quality measurement division. The standards that form this division include a system/software product quality measurement reference model, definitions of quality measures, and practical guidance for their application. This division presents internal measures of software quality, external measures of software quality, quality in use measures, data quality measures and IT service quality measures. Quality measure elements forming foundations for the quality measures are defined and presented.

— ISO/IEC 2503n — Quality requirements division. The standards that form this division help to 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 that form 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 measure as an Evaluation Module is also presented.

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ISO/IEC 25050 to ISO/IEC 25099 are reserved for SQuaRE extension International Standards, Technical Specifications, Publicly Available Specifications (PAS) and/or Technical Reports.

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Information technology — Systems and software Quality Requirements and Evaluation (SQuaRE) — Measurement of IT service quality

1 Scope

This document defines quality measures useful for requirements and evaluation of IT service quality in terms of characteristics and sub-characteristics defined in ISO/IEC TS 25011.

This document contains a basic set of quality measures for each characteristic and sub-characteristic.

This document does not assign ranges of values of the quality measures to rated levels or to grades of compliance. Such values are defined based on the nature of the IT service, and so depends on factors such as category of the IT service or users' needs. Some attributes can have a desirable range of values, which does not depend on specific user needs but generic factors, for example, service downtime. This document includes, in Annex A, considerations for the selection and application of quality measures.

The quality measures in this document are primarily intended to be used for quality evaluation and improvement of IT services during or after the development life cycle.

The main users of this document are people carrying out quality requirements specification and evaluation activities for IT services as part of the following:

— development: including requirements analysis, design, implementation, testing and deployment during the development life cycle;

— quality management: monitoring activities of quality assurance and performing quality control of an IT service;

— supply: making a contract with the user for supplying an IT service under the terms of a contract;

— acquisition: including IT service selection, when acquiring or procuring an IT service from a service provider;

— maintenance: improvement of an IT service based on quality measurement.

The relationship of this document to domain-specific IT service quality model and its precedence over this document is determined by the user in a specific context of use.

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

ISO/IEC TS 25011:2017, *Information technology — Systems and software Quality Requirements and Evaluation (SQuaRE) — Service quality models*

ISO/IEC 25021:2012, *Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality measure elements*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 25000 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
quality measure
derived measure that is defined as a *measurement function* (3.5) of two or more values of quality measure elements

[SOURCE: ISO/IEC 25021:2012, 4.13]

3.2
IT service
information technology service
service that makes use of IT systems as tools to provide value to an individual user or a business by facilitating results the user or business wants to achieve

Note 1 to entry: IT services can be delivered remotely by people, or by an IT application that could be in a local or remote location.

[SOURCE: ISO/IEC TS 25011:2017, 3.3.2, modified — "information technology service" has been changed from a preferred term to an admitted term.]

3.3
IT service quality
degree to which an *IT service* (3.2) satisfies stated and implied needs when used under specified conditions

[SOURCE: ISO/IEC TS 25011:2017, 3.3.10]

3.4
IT service function
collection of related steps performed as a part of an *IT service* (3.2), or features provided by an IT system

EXAMPLE The service status monitoring or data backup of an internet banking service.

Note 1 to entry: ISO/ IEC has software functionality identification, classification and sizing standard methods that provides consistency identifying unique IT service functions; these include: ISO/IEC 20926 (IFPUG method), ISO/IEC 19761 (COSMIC method), ISO/IEC 29881 (FiSMA method), ISO/IEC 20968 (MarkII method), ISO/IEC 24570 (NESMA method).

3.5
measurement function
algorithm or calculation performed to combine two or more quality measure elements

[SOURCE: ISO/IEC 25021:2012, 4.7, modified — Note 1 to entry has been removed.]

3.6
service provider
organization that manages and delivers a service or services to customers

[SOURCE: ISO/IEC 20000-1:2018, 3.2.24]

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3.7
service level agreement
SLA
documented agreement between the *IT service* (3.2) provider and the user that identifies services and their agreed performance

Note 1 to entry: A service level agreement can be included in a contract or another type of documented agreement.

[SOURCE: ISO/IEC 20000-1:2018, 3.2.20, modified — "the organization and the customer" has been changed to "the IT service provide and the user"; the original note 1 to entry has been removed; the original note 2 to entry has become note 1 to entry.]

4 Conformance

Any quality requirements specification or quality evaluation that conforms to this document shall:

a) select the quality characteristics and/or sub-characteristics to be specified or evaluated as defined in ISO/IEC TS 25011;

b) provide the rationale for any modifications of quality measures;

c) define any additional quality measures and quality measure elements from ISO/IEC 25021 that are not included in this document.

5 Use of IT service quality measures

5.1 IT service quality measurement concepts

This document provides quality measures for the characteristics and sub-characteristics of the service quality model defined in ISO/IEC TS 25011. IT service quality characteristics are defined in ISO/IEC TS 25011 that categorizes IT service quality into 8 characteristics.

The quality of an IT service is the degree of satisfying the stated and implied needs of its users and thus provides value. These stated and implied needs are represented in the SQuaRE series of standards by quality models that categorize IT service quality into characteristics, which in most cases are further subdivided into sub-characteristics.

The quality characteristic and sub-characteristic can be quantified by applying measurement functions. The measurement function of a quality measure is defined using a mathematical formula by combining quality measure elements. Quality measures enable us to quantify the quality of an IT service. More than one quality measure can be used for the measurement of quality characteristics and sub-characteristics.

5.2 Approach to IT service quality measurement

This document provides a possible, suggested set of IT service quality measures to be used with the quality model in ISO/IEC TS 25011. The user of this document can select suitable quality measures for a specific service and assign different weighting to these quality measures for different types of IT services.

When selecting the appropriate IT service quality measures, the factors which can influence the selection can include the following:

— the importance of the property to quantify;

— the type of the target IT service;

— the user requirements.

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