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Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE): -cloud services - Part 1: Quality ~~Model model~~

Publication stage

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A model manuscript of a draft International Standard (known as "The Rice Model") is available at <https://www.iso.org/iso/model-document-rice-model.pdf>

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*Ingénierie des systèmes et du logiciel — Exigences de qualité et évaluation des systèmes et du logiciel
(SQuARE): services en nuage — Partie 1: Modèles de qualité*

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Foreword

ISO (the International Organization for Standardization) ~~is a~~ and IEC (the International Electrotechnical Commission) ~~form the specialized system for worldwide federation of national standards~~ standardization. National bodies ~~(that are members of ISO member bodies). The work~~ IEC ~~participate in the development of preparing~~ International Standards ~~is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International~~ 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. ~~ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.~~

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 ~~ISO documents~~ 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 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 <https://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~~ 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 JTC1 SC7WG6 JTC 1, *Information technology, Subcommittee SC 7, Software and systems engineering*.

A list of all parts in the ISO/IEC TS 25052 series can be found on the ISO website.

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

Introduction

In the SQuaRE series, there are well-defined quality models for measuring and evaluating system and software products, IT services, data, and so on etc. Although the SQuaRE series provides practical quality models, it does not fit new technologies well. To support the evaluation of new technologies, this document provides the quality model of cloud services, which is the extension to the quality models defined in ISO/IEC 25011. As the extension of SQuaRE series, this document provides a quality model of cloud services, 25011. In order to provide a practical guideline for quality evaluation of cloud services, this document has reflected special considerations on cloud computing, which are key characteristics, and cross-cutting aspects described in ISO/IEC 17788, and Service Level Agreement service level agreement (SLA) framework described in ISO/IEC 19086, and so on. (all parts).

Compared to the information and communication technology (ICT) systems, cloud computing has different characteristics. The followings are the key characteristics of cloud computing described in ISO/IEC 17788.

- Broad network access: physical or virtual resources are available when needed through the network using a variety of client devices.
- Measured service: resources are measured and paid for on a usage basis.
- Multi-tenancy: physical and virtual resources are allocated to multiple tenants, and their computations and data are isolated, therefore inaccessible from one another.
- On-demand self-service: cloud services are provisioned by cloud service customers automatically or with minimal interaction with cloud service providers.
- Rapid elasticity and scalability: resources are increased or decreased rapidly and elastically, and scalable horizontally and vertically.
- Resource pooling: physical or virtual resources are aggregated to provide services to one or more cloud service customers.

The quality model in this document is to support the non-functional specification and evaluation of cloud services from different perspectives by those associated with cloud service selection, requirements analysis, development, use, evaluation, support, maintenance, quality assurance and control, and audit.

For example, activities during cloud service selection that can benefit from the use of the quality model include:

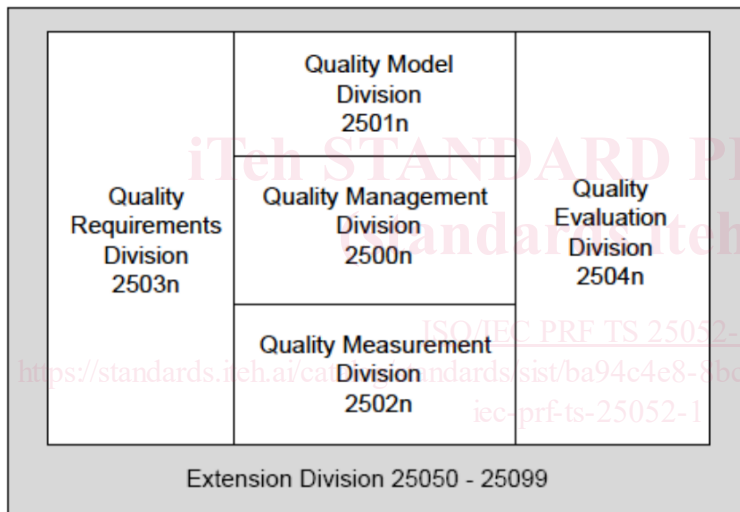
- identifying cloud services requirements;
- establishing cloud service selection criteria;
- defining service coverage and service objectives;
- establishing service level agreements;
- establishing measures of quality characteristics in support of these activities.

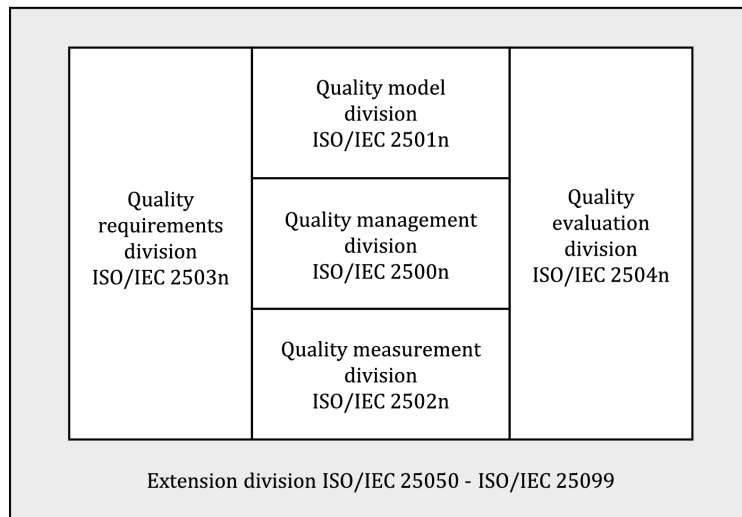
Activities during cloud service development that can benefit from the use of the quality model include:

- identifying cloud service requirements;
- validating comprehensiveness of requirement definitions;

- identifying cloud service design objectives;
- identifying cloud service testing objectives;
- identifying quality control criteria as part of quality assurance;
- identifying acceptance criteria for a cloud service;
- establishing measures of quality characteristics in support of these activities.

Figure_1 (adapted from ISO/IEC-25000) illustrates the organization of the SQuaRE series representing families of standards, further called divisions. This document belongs to ~~Extension Division~~ ~~extension division~~ 25050 -to 25099.





Figure_1.— Organization of the SQaRE series of International Standards

The divisions within the SQaRE series are:

- **ISO/IEC 2500n - Quality Management Division** ~~management division~~. The International Standards that form this division define all common models, terms and definitions further referred to by all other International Standards from the SQaRE series. The division also provides requirements and guidance for a supporting function that is responsible for the management of the requirements, specification and evaluation of software product quality.
- **ISO/IEC 2501n - Quality Model Division** ~~model division~~. The International Standards that form this division present detailed quality models for computer systems and software products, quality in use, and data. Practical guidance on the use of the quality models is also provided.
- **ISO/IEC 2502n - Quality Measurement Division** ~~measurement division~~. The International Standards that form this division include a quality model framework, mathematical definitions of quality measures, and practical guidance for their application. Examples are given of quality measures for software quality, and measures for quality in use. Quality ~~Measure Elements~~ ~~measure elements~~ (QME) forming foundations for these measures are defined and presented.
- **ISO/IEC 2503n - Quality Requirements Division** ~~requirements division~~. The International Standards that form this division help specify quality requirements, based on quality models and quality measures. These quality requirements can be used in the process of quality requirements elicitation for a software product to be developed or as input for an evaluation process.
- **ISO/IEC 2504n - Quality Evaluation Division** ~~evaluation division~~. The International Standards that form this division provide requirements, recommendations and guidelines for software product evaluation, whether performed by evaluators, acquirers or developers. The support for documenting a measure as an ~~Evaluation Module~~ ~~evaluation module~~ is also presented.

~~— ISO/IEC 25050 – to ISO/IEC 25099 – SQUARE Extension Division. These extension division. This division includes International Standards currently includes specifying requirements for quality of Readyready to Use Software Productuse software product and Common Industry Formatscommon industry formats for usability reports, as well as this Technical Specificationdocument.~~

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