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

*Ingénierie des systèmes et du logiciel — Exigences de qualité des
systèmes et du logiciel et évaluation (SQuaRE) — Guide de SQuaRE*

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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.

ISO/IEC 25000 was prepared by Joint 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 25000:2005), of which it constitutes a minor revision.

The SQuaRE series of standards consists of the following divisions under the general title *Systems and Software Quality Requirements and Evaluation (SQuaRE)*:

- ISO/IEC 2500n, *Quality Management Division*,
- ISO/IEC 2501n, *Quality Model Division*,
- ISO/IEC 2502n, *Quality Measurement Division*,
- ISO/IEC 2503n, *Quality Requirements Division*, and
- ISO/IEC 2504n, *Quality Evaluation Division*.

ISO/IEC 25050 to ISO/IEC 25099 are reserved to be used for SQuaRE extension International Standards and/or Technical Reports.

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Introduction

Computers are being used in an increasingly wide variety of application areas, and their intended and correct operation is often critical for business success and/or human safety. Developing or selecting high quality systems and products is therefore of prime importance. Comprehensive specification and evaluation of systems and software product quality is a key factor in ensuring adequate quality. This can be achieved by defining appropriate quality characteristics, while taking account of the intended use of the systems and software product. It is important that every relevant system and software product quality characteristic is specified and evaluated, whenever possible using validated or widely accepted measures.

As quality characteristics and associated measures can be useful not only for evaluating a systems and software product but also for defining quality requirements, the predecessor of SQuaRE, ISO/IEC 9126:1991 has been replaced by two related multipart International Standards: ISO/IEC 9126 (Software product quality) and ISO/IEC 14598 (Software product evaluation). The following points derived from practical use of both series gave the logical impulse for creating the new SQuaRE series of International Standards:

- Both ISO/IEC 9126 and ISO/IEC 14598 have common normative, referential and functional roots.
- ISO/IEC 9126 and ISO/IEC 14598 form a complementary set of standards.
- The independent life cycles of both series have created inconsistencies between them.

The general goal of creating the SQuaRE set of International Standards was to move to a logically organized, enriched and unified series covering two main processes: software quality requirements specification and systems and software quality evaluation, supported by a systems and software quality measurement process. The purpose of the SQuaRE set of International Standards is to assist those developing and acquiring systems and software products with the specification and evaluation of quality requirements. It establishes criteria for the specification of systems and software product quality requirements, their measurement, and evaluation. It includes a two-part quality model for aligning customer definitions of quality with attributes of the development process. In addition, the series provides recommended measures of systems and software product quality attributes that can be used by developers, acquirers, and evaluators.

It has to be stressed that the SQuaRE series of International Standards is dedicated to systems and software product quality only. SQuaRE ISO/IEC 2500n — Quality Management Division addresses systems and software product quality requirements specification, measurement and evaluation, and is separate and distinct from the “Quality Management” of processes, which is defined in the ISO 9000 family of standards.

The major benefits of the SQuaRE series over its predecessor standards include:

- the coordination of guidance on systems and software product quality measurement and evaluation,
- guidance for the specification of systems and software product quality requirements, and
- harmonization with ISO/IEC 15939 in the form of Software product Quality Measurement Reference Model presented in ISO/IEC 25020, *Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Measurement reference model and guide*.

The major differences between ISO/IEC 9126, ISO/IEC 14598 and SQuaRE series of International Standards are:

- the introduction of the new general reference model,
- the introduction of dedicated, detailed guides for each division,
- the introduction of systems product quality,
- the introduction of a data quality model,

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- the introduction of Quality Measure Elements within Quality Measurement Division,
- the introduction of the Quality Requirements Division,
- incorporation and revision of the evaluation processes,
- the introduction of guidance of practical use in form of examples,
- coordination and harmonization of the content with ISO/IEC 15939.

SQuaRE consists of the following five divisions:

- ISO/IEC 2500n - Quality Management Division,
- ISO/IEC 2501n - Quality Model Division,
- ISO/IEC 2502n - Quality Measurement Division,
- ISO/IEC 2503n - Quality Requirements Division,
- ISO/IEC 2504n - Quality Evaluation Division, and
- ISO/IEC 25050 to ISO/IEC 25099 - Extension division

SQuaRE provides:

- Terms and definitions,
- Reference models,
- General guide,
- Individual division guides, and
- International Standards for requirements specification, planning and management, measurement and evaluation purposes.

SQuaRE includes International Standards on quality model and measures, as well as on quality requirements and evaluation.

SQuaRE replaces the ISO/IEC 9126 series and the ISO/IEC 14598 series.

This part of SQuaRE series of standards is an International Standard with the goal of providing a common set of reference models, terminology, definitions and guidance for practical use of the associated standards and technical reports.