AS ISO/IEC 25000:2019

Australian STANDARD

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

STANDARDS Australia

AS ISO/IEC 25000:2019

This Australian Standard® was prepared by IT-015, Software and Systems Engineering. It was approved on behalf of the Council of Standards Australia on 11 June 2019.

This Standard was published on 28 June 2019.

The following are represented on Committee IT-015:

Australian Computer Society
Australian Digital Health Agency
Australian Society for Technical Communication (NSW)
Department of Defence (Australian Government)
Engineers Australia
Griffith University
IT Service Management Forum Australia
NSW Business Chamber
Quantitative Enterprise Software Performance
Systems Engineering Society of Australia
University of New South Wales
University of Southern Queensland
University of Technology Sydney

This Standard was issued in draft form for comment as DR AS ISO/IEC 25000:2019.

**Keeping Standards up-to-date**

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:
www.standards.org.au

ISBN 978 1 76072 511 2

AS ISO/IEC 25000:2019
ISO/IEC 25000:2014

Australian STANDARD

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

Originated as AS/NZS ISO/IEC 25000:2007.
Revised and redesignated as AS ISO/IEC 25000:2019.

**COPYRIGHT**

© ISO/IEC 2019 — All rights reserved
© Standards Australia Limited 2019

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

# Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee IT-015, Software and Systems Engineering, to supersede AS/NZS ISO/IEC 25000:2007, *Software engineering—Software product Quality Requirements and Evaluation (SQuaRE)—Guide to SQuaRE*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide guidance for the use of the new series of International Standards named Systems and software Quality Requirements and Evaluation (SQuaRE). This Standard provides a general overview of SQuaRE contents, common reference models and definitions, as well as the relationship among the documents, allowing users a good understanding of those series of standards, according to their purpose of use. It also contains an explanation of the transition process between the old AS/NZS ISO/IEC 9126 series and the AS/NZS ISO/IEC 14598 series and SQuaRE.

This Standard is identical with, and has been reproduced from, ISO/IEC 25000:2014, *Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guide to SQuaRE.*

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text "this International Standard" should read "this Australian Standard".

(b) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms "normative" and "informative" are used in Standards to define the application of the appendices or annexes to which they apply. A "normative" appendix or annex is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

© Standards Australia Limited 2019

# Contents

**Preface** ii

**Foreword** iv

**Introduction** v

**1 Scope** 1

**2 Conformance** 1

**3 Normative references** 1

**4 Terms and definitions** 1

**5 SQuaRE: Systems and software Quality Requirements and Evaluation - the series of standards on product quality requirements and evaluation** 7

5.1 Organisation of SQuaRE series of standards 7

5.2 SQuaRE: overview of documents within series 8

5.2.1 ISO/IEC 2500n - Quality Management Division 8

5.2.2 ISO/IEC 2501n - Quality Model Division 8

5.2.3 ISO/IEC 2502n - Quality Measurement Division 9

5.2.4 ISO/IEC 2503n - Quality Requirements Division 9

5.2.5 ISO/IEC 2504n - Quality Evaluation Division 9

5.2.6 ISO/IEC 25050 to 25099 -SQuaRE extension 9

5.3 SQuaRE common models 10

5.3.1 General 10

5.3.2 SQuaRE general reference model 11

5.3.3 System and software product quality life cycle model 12

5.3.4 Quality model structure 13

**Annex A** (informative) **Relationship between SQuaRE series and other ISO Standards** 14

**Annex B** (informative) **History and transition process between ISO/IEC 9126, ISO/IEC 14598 and ISO/IEC 25000 SQuaRE series of standards** 19

**Annex C** (informative) **Examples of the application of ISO/IEC 25000 SQuaRE series of standards** 21

**Annex D** (informative) **Background and needs for SQuaRE series** 24

**Bibliography** 26

# 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.

© Standards Australia Limited 2019

# 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,

© Standards Australia Limited 2019

— 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.

© Standards Australia Limited 2019

# Australian Standard®

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

## 1 Scope

This International Standard provides guidance for the use of the new series of International Standards named Systems and software Quality Requirements and Evaluation (SQuaRE). The purpose of this Guide is to provide a general overview of SQuaRE contents, common reference models and definitions, as well as the relationship among the documents, allowing users of the Guide a good understanding of those series of standards, according to their purpose of use. This International Standard also contains an explanation of the transition process between the old ISO/IEC 9126 and the ISO/IEC 14598 series and SQuaRE.

The SQuaRE series of International Standards is intended for, but not limited to, developers, acquirers and independent evaluators of systems and software products, particularly those responsible for defining systems and software quality requirements and for systems and software product evaluation. It is recommended that users of SQuaRE as well as ISO/IEC 14598 and ISO/IEC 9126 series of standards also use this International Standard as a guide to execute their tasks.

## 2 Conformance

There is no particular conformance clause for this document. Users, for their intended use of SQuaRE series of Standards should follow individual conformance clauses stated in each document of the series.

## 3 Normative references

This International Standard does not require any normative references. All informative references are presented in the Bibliography.

## 4 Terms and definitions

For the purposes of this document, the following definitions apply.

NOTE The definitions are common to all parts of SQuaRE series of International Standards.

**4.1**
**attribute**
inherent property or characteristic of an entity that can be distinguished quantitatively or qualitatively by human or automated means

Note 1 to entry: Based on ISO/IEC 15939:2007.

Note 2 to entry: ISO 9000 distinguishes two types of attributes: a permanent characteristic existing inherently in something; and an assigned characteristic of a product, process or system (e.g. the price of a product, the owner of a product). The assigned characteristic is not an inherent quality characteristic of that product, process or system.

**4.2**
**context of use**
users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a product is used

[SOURCE: ISO 9241-11:1998]

**4.3**
**custom software**
software product developed for a specific application from a user requirements specification

© Standards Australia Limited 2019