

Australian/New Zealand Standard™

**Software engineering—Software
product Quality Requirements and
Evaluation (SQuaRE)—Common
Industry Format (CIF) for usability test
reports**



AS/NZS ISO/IEC 25062:2006

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-015, Software and Systems Engineering. It was approved on behalf of the Council of Standards Australia on 27 October 2006 and on behalf of the Council of Standards New Zealand on 11 November 2006.
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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF

AS/NZS ISO/IEC 25062:2006

**Software engineering—Software product Quality Requirements and Evaluation
(SQuaRE)—Common Industry Format (CIF) for usability test reports**

RECONFIRMATION NOTICE

Technical Committee IT-015 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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NOTES

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-015, Software and Systems Engineering.

The objective of this Standard is to provide software usability professionals within supplier organizations and customer organizations with a software usability testing Standard; the Standard is a key factor in predicting successful deployment of software.

This Standard is identical with, and has been reproduced from ISO/IEC 25062:2006, *Software engineering—Software product Quality Requirements and Evaluation (SQuaRE)—Common Industry Format (CIF) for usability test reports*.

As this Standard is reproduced from an international standard, the following applies:

- (a) Its number appears on the cover and title page while the international standard number appears only on the cover.
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
ISO/IEC		AS/NZS	ISO/IEC
9126	Software engineering—Product quality	9126	Software engineering—Product quality
9126-1	Part 1: Quality model	9126.1	Part 1: Quality model
9126-2	Part 2: External metrics	9126.2	Part 2: External metrics
9126-3	Part 3: Internal metrics	9126.3	Part 3: Internal metrics
9126-4	Part 4: Quality in use metrics	9126.4	Part 4: Quality in use metrics
14598	Information technology—Software product evaluation	14598	Information technology—Software product evaluation
14598-5	Part 5: Process for evaluators	14598.5	Part 5: Process for evaluators

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

CONTENTS

	<i>Page</i>
1 Scope	1
2 Conformance.....	1
3 Normative references	2
4 Terms and definitions.....	2
5 Report Format	4
5.1 Title page	4
5.2 Executive summary	4
5.3 Introduction	5
5.4 Method	5
5.5 Results	11
5.6 Appendices.....	14
Annex A (informative) Checklist	15
Annex B (informative) Glossary	19
Annex C (informative) Report Template.....	23
Annex D (informative) Example	29
Bibliography	46

INTRODUCTION

Usability of software is a key factor in predicting successful deployment of that software. Software manufacturers subject software to usability testing at various stages in a product's development; some companies that purchase software also test products for usability before making purchasing decisions. Testing often involves (1) subjects who are representative of the target population of users of the software, (2) representative tasks, and (3) measures of efficiency, effectiveness and subjective satisfaction. When this type of experimental situation exists, the testing is termed summative, i.e., the results can be expressed as statistically meaningful measures of central tendency (e.g. mean or median) and variability (e.g. standard deviation). The Common Industry Format (CIF) for Usability Test Reports is intended for use by usability professionals to report the results of summative usability testing.

The CIF standardizes the types of information that are captured about testing with users. The level of detail allows the same or another organization to replicate the test procedure. The major variables are user demographics, task descriptions, context of the test, including the equipment used, the environment in which the test is conducted, and the protocol by which the subjects and the test administrator(s) interact, as well as the particular metrics chosen to code the findings of the study.

The CIF is intended to replace the proprietary formats employed by companies that perform usability testing, both vendors and purchasers of software. Until now there has been no standard format for reporting usability testing results. Advantages of using a standardized reporting format include (1) a reduction in training time for usability staff since an individual only needs to learn to use one form regardless of how many companies he works for and (2) enhanced potential for increased communication between vendors and purchasing organizations since readers of CIF-compliant reports will share a common language and expectations.

The purpose of this International Standard is to facilitate incorporation of usability as part of the procurement decision-making process for interactive software products so that it is easier to judge whether a product meets usability goals. Examples of decisions include purchasing, upgrading and automating. It provides a common format for human factors engineers and usability professionals in supplier companies to report the methods and results of usability tests to customer organizations.

Audience

The Common Industry Format (CIF) is meant to be used by usability professionals within supplier organizations to generate reports that can be used by customer organizations in the CIF report. The CIF is also meant to be used by customer organizations to verify that a particular report is CIF-compliant. The Usability Test Report itself is intended for two types of readers:

- Usability professionals in customer organizations who are evaluating both the technical merit of usability tests and the usability of the products; and
- Other technical professionals and managers who are using the test results to make business decisions.

The CIF may also be used within a single organization if a formal report of a summative usability test needs to be generated. In this case additional material such as a list of detailed findings may be included.

The report is in two main sections, an Executive Summary and a main body. The main body contains the Methods and Results sections and is aimed at the first audience above. These sections (1) describe the test methodology and results in sufficient technical detail to allow replication by another organization if the test is repeated, and (2) support application of test data to questions about the product's expected costs and benefits. Understanding and interpreting these sections will require technical background in human factors or usability engineering for optimal use. The second audience is directed to the Introduction, which provides summary information for non-usability professionals and managers. The Introduction may also be of general interest to other computing professionals. Decision makers without usability engineering expertise may find the information in the main body to be useful but should rely on expert interpretation when necessary.

Organization

Clause 1 describes the scope of this specification and the conformance criteria. Clause 4 provides definitions

of the terms used throughout the document. Clause 5 is the main description of the specification.

Additional Information

Annex A provides a checklist that can be used to ensure inclusion of required and recommended information. A glossary is provided in Annex B to define terminology used in the report format description. A Word template for report production can be found at: http://www.ncits.org/ref-docs/CIF/CIF_template.dot. A printed version of the template can be found in Annex C. An example is provided in Annex D illustrating how the format is used followed by an informative bibliography.

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for usability test reports

1 Scope

This International Standard is intended to be used to report the measures obtained from a test of usability as defined in ISO 9241-11: effectiveness, efficiency and satisfaction in a specified context of use.

NOTE Metrics for other more-detailed usability requirements can be found in ISO/IEC 9126 parts 2 and 3.

This International Standard is intended to be used by:

- usability professionals within supplier organizations to generate reports that can be used by customer organizations;
- customer organizations to verify that a particular report conforms to this International Standard;
- human factors or other usability professionals in customer organizations who are evaluating both the technical merit of usability tests and the usability of the products; and
- other technical professionals and managers in the customer organization who are using the test results to make business decisions about product suitability and purchase.

The Executive Summary and Introduction in 5.2 and 5.3 provide summary information for nonusability professionals and managers.

Subclauses 5.4 and 5.5 describe the test methodology and results in technical detail suitable for replication, and also support application of test data to questions about the product's expected costs and benefits. Understanding and interpreting these sections will require technical background in human factors or usability engineering for optimal use.

The report format assumes sound practice [1, 2] has been followed in the design and execution of the test. Test procedures which produce measures that summarize usability should be used, i.e. the test is summative in nature. Some usability evaluation methods, such as formative tests, are intended to identify problems rather than produce measures; the format is not structured to support the results of such testing methods.

2 Conformance

A usability test report conforms to this International Standard if it complies with all the requirements in this International Standard (stated as “shall”). The recommendations (stated as “should”) should be implemented whenever appropriate.

This International Standard specifies the minimum information that should be provided. Additional information may be included. For example, if an organization finds that an additional list of findings is useful, the list may be included even though it is not specified as part of a conformant CIF report.

3 Normative references

The following referenced documents are indispensable for the application 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 9126-1:2001, *Software engineering — Product quality — Part 1: Quality model*

ISO/IEC 9126-2:2001, *Software engineering — Product quality — Part 2: External metrics*

ISO/IEC 9126-3:2001, *Software engineering — Product quality — Part 3: Internal metrics*

ISO/IEC 9126-4:2001, *Software engineering — Product quality — Part 4: Quality in use metrics*

ISO 9241-11:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability*

ISO 13407:1999, *Human-centred design processes for interactive systems — Annex C*

ISO/IEC 14598-5:1998, *Information technology — Software product evaluation — Part 5: Process for evaluators*

4 Terms and definitions

For the purposes of this document, the following definitions apply. The source for definitions 4.1 to 4.9 is ISO 9241-11:1998.

NOTE Efficiency, effectiveness, and satisfaction are defined in ISO/IEC 9126 in a similar way to the definitions in ISO/IEC 9241. However, in ISO/IEC 9126 they are defined in terms of the software product where as in ISO/IEC 9241 they are defined in terms of the user's view. The term efficiency in this International Standard is equivalent to the term productivity in ISO 9126, as the term efficiency has been defined with a different meaning in ISO 9126.

4.1

usability

the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

NOTE Quality in use is defined in ISO/IEC 9126 in a similar way to the definition of usability in ISO/IEC 9241. Quality in use may be influenced by any of the quality characteristics, and is thus broader than the definition of usability in ISO/IEC 9126 that is in terms of understandability, learnability, operability, attractiveness and compliance.

4.2

effectiveness

the accuracy and completeness with which users achieve specified goals

4.3

efficiency

resources expended in relation to the accuracy and completeness with which users achieve goals

NOTE Efficiency in the context of usability is related to "productivity" rather than to its meaning in the context of software efficiency.

4.4

satisfaction

freedom from discomfort, and positive attitudes towards the use of the product

4.5**context of use**

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

4.6**user**

person who interacts with the product

4.7**user group**

subset of intended users who are differentiated from other intended users by factors such as age, culture or expertise that are likely to influence usability

4.8**goal**

intended outcome of user interaction with a product

NOTE Specific goals relating to user interaction may be referred to as “task goals”

4.9**task**

activities required to achieve a goal

NOTE 1 These activities can be physical or cognitive.

NOTE 2 Job responsibilities can determine goals and tasks.

4.10**accessibility**

usability of a product, service, environment or facility by people with the widest range of capabilities

NOTE 1 Although “accessibility” typically addresses users who have a disability, the concept is not limited to disability issues.

NOTE 2 The usability-oriented concept of accessibility focuses on achieving levels of effectiveness, efficiency and satisfaction that are as high as possible taking account of the specified context of use, while paying particular attention to the diversity of the capabilities within the user population, and thus aims to minimize the differences in usability experienced by individuals.

4.11**assistive technologies**

hardware or software that is added to or incorporated within a system that increases accessibility for an individual

EXAMPLES Braille displays, screen readers, screen magnification software and eye tracking devices are assistive technologies.

4.12**assist**

tester intervention in the form of direct procedural help provided by the test administrator to the test participant in order to allow the test to continue when the participant could not complete the tasks on their own

5 Report Format

5.1 Title page

The following information shall be provided:

- Identify report as: ISO/IEC 25062 Common Industry Format for Usability Test Reports and contact information.
- Name the product and version that was tested.
- Who led the test.
- When the test was conducted.
- Date the report was prepared.
- Who prepared the report.
- Contact name(s) for questions and/or clarifications.
- Supplier phone number.
- Supplier e-mail address.
- Supplier mailing or postal address.

The following information should be provided:

- Customer Company Name.
- Customer Company contact person.

5.2 Executive summary

This section provides a high level overview of the test. The intent of this section is to provide information for procurement decision-makers in customer organizations. These people might not read the technical body of this document.

This section shall begin on a new page and end with a page break to facilitate its use as a stand-alone summary.

A high level overview of the test shall be provided that includes:

- Name and description of the product.
- Summary of method(s) including number(s) and type(s) of participants and tasks.
- Performance and satisfaction results expressed as mean scores or other suitable measure of central tendency.

The following information should be provided:

- Reason for and nature of the test.
- Tabular summary of performance results.

- If differences between values or products are claimed, the probability that the difference did not occur by chance.

5.3 Introduction

This clause provides a description of the product and the test objectives.

5.3.1 Full product description

The following information shall be provided:

- Formal product name and release or version.
- The parts of the product that were evaluated.
- The user population for which the product is intended.

The following information should be provided:

- Assistive technologies that are supported by the product.
- Brief description of the physical and social environment(s) in which the product is intended to be used.
- The type of user work that is supported by the product.

5.3.2 Test objectives

The following information shall be provided:

- The objectives for the test including any areas of specific interest.

NOTE Possible objectives include testing user performance of work tasks and subjective satisfaction in using the product to assess whether a product meets specific success criteria.

- Functions and components with which the user directly and indirectly interacted.

The following information should be provided:

- Reason for focusing on a product subset, if the whole product was not tested.

5.4 Method

Sufficient information shall be provided to allow an independent tester to replicate the procedure used in testing.

5.4.1 Participants

The following information shall be provided:

- The total number of participants tested.

NOTE In order to generate valid summative statistical analyses, it is necessary to test sufficient numbers of subjects. Eight or more subjects/cell (segment) are recommended for this purpose [9].

- Segmentation of user groups tested, if more than one.
- Key characteristics and capabilities of user group.

- How participants were selected; whether they had the essential characteristics.
- Differences between the participant sample and the user population.

EXAMPLE Actual users might attend a training course whereas test subjects were untrained.

- Table of participants (row) by characteristics (columns), including demographics, professional experience, computing experience and user needs for assistive technology.

NOTE Subjects with needs for assistive technology might be individuals with physical or cognitive disabilities.

EXAMPLE The table below is an example; the characteristics that are shown are typical but might not necessarily cover every type of testing situation.

•	Gender	Age	Education	Occupation / role	Professional Experience	Computer Experience	Product Experience
P1	•	•	•	•	•	•	•
P2	•	•	•	•	•	•	•
Pn	•	•	•	•	•	•	•

For 'Gender', the table entries are male or female.

For 'Age', the table entries state the chronological age of the participant, or indicate membership in an age range (e.g., 25-45) or age category (e.g., under 18, over 65) if the exact age is not known.

For 'Education', the table entries state the number of years of completed formal education (e.g., in the US, a high-school graduate would have 12 years of education and a college graduate 16 years). In some instances, level of education might be stated as 'highest academic degree'.

For 'Occupation/role', the table entries describe the user's job role when using the product. Use the Role title if known.

For 'Professional experience', the table entries give the amount of time the user has been performing in the role.

For 'Computer experience', the table entries describe relevant background such as how much experience the user has with the platform or operating system, and/or the product domain. This might be more extensive than one column.

For 'Product experience', the table entries indicate the type and duration of any prior experience with the product or with similar products.

The characteristics and capabilities shall be complete enough so that an essentially similar group of participants can be recruited.

Characteristics and capabilities should be chosen to be relevant to the product's usability; they should allow a customer to determine how similar the participants were to the customers' user population.

The following information should be provided:

- Description of any users with needs for assistive technology.

Participants should not be from the same organization as the testing or supplier organization.

5.4.2 Context of product use in the test

The following information shall be provided:

- Any important differences between the evaluated context and the expected context of use.

5.4.2.1 Tasks

The following information shall be provided:

- The tasks for testing.
- The task scenarios for testing.
- Why these tasks were selected.

EXAMPLES The most frequent tasks, the most troublesome tasks.

- The source of these tasks.

EXAMPLES Observation of customers using similar products, product marketing specifications, discussion with users or design team.

- Any task data given to the participants.

EXAMPLE Source materials for data entry.

- Completion or performance criteria established for each task.

5.4.2.2 Test facility

The following information should be provided:

- The setting and type of space in which the evaluation was conducted.

EXAMPLES Usability lab, cubicle office, meeting room, home office, home family room, manufacturing floor.

- Any relevant features or circumstances that could affect the results.

EXAMPLES Video and audio recording equipment, one-way mirrors, or automatic data collection equipment.

5.4.2.3 Participant's computing environment

The following information shall provide enough information to replicate and validate the test, including:

- Computer configuration, including model, OS version, required libraries or settings.
- If used, browser name and version; relevant plug-in names and versions.

5.4.2.3.1 Display devices

The following information shall be provided:

- If screen-based, screen size, resolution, and colour setting.
- If print-based, the media size and print resolution.
- If visual interface elements (such as fonts) can vary in size, specify the size(s) used in the test.

5.4.2.3.2 Audio devices

The following information should be provided:

- If used, the relevant settings or values for the audio bits (determining sound quality), volume, etc.

5.4.2.3.3 Input devices

The following information should be provided:

- If used, the make and model of devices used in the test.

5.4.2.4 Test administrator tools

The following information shall be provided:

- If a standard questionnaire (Section 5.4.4.3 contains a partial list) was used, describe or specify it here.

NOTE Customized questionnaires are included in an appendix.

The following information should be provided:

- Any hardware or software used to control the test or to record data.

5.4.3 Experimental design

The following information shall be provided:

- The experimental design of the test; the plan for assigning experimental conditions to participants and the statistical analysis associated with the plan independent variables and control variables.
- The independent variables and control variables.
- The measures for which data were recorded for each set of conditions.

5.4.3.1 Procedure

The following information shall be provided:

- Operational definitions of measures.
- Descriptions of independent variables or control variables.
- Time limits on tasks.
- Policies and procedures for interaction between tester(s) and subjects.

The following information should be provided:

- Sequence of events from greeting the participants to dismissing them.
- Details of nondisclosure agreements, form completion, warm-ups, pretask training, and debriefing.
- Verification that the participants knew and understood their rights as human subjects [1].
- Steps followed to execute the test sessions and record data.
- Number and roles of people who interacted with the participants during the test session.
- Whether other individuals were present in the test environment.

- Whether participants were paid or otherwise compensated.

5.4.3.2 Participant general instructions

The following information shall be provided:

- Instructions given to the participants (here or in an Appendix).
- Instructions on how participants were to interact with any other persons present, including how they were to ask for assistance and interact with other participants, if applicable.

5.4.3.3 Participant task instructions

The following information shall be provided:

- Task instruction summary.

5.4.4 Usability metrics

As defined in 4.1, usability is measured by three types of metrics: effectiveness, efficiency, and satisfaction. The choice of measures depends on the goals of a particular study, characteristics of the users, the specific tasks, and context-dependent features; e.g., see Dumas and Redish [4].

The following information shall be provided:

- Metrics for effectiveness.
- Metrics for efficiency.
- Metrics for satisfaction.

Effectiveness and efficiency results shall be reported, even when they are difficult to interpret within the specified context of use. In this case, the report shall specify why the supplier does not consider the metrics meaningful.

EXAMPLE Suppose that the context of use for the product includes real time, open-ended interaction between close associates. In this case, Time-On-Task may not be meaningfully interpreted as a measure of efficiency, because for many users, time spent on this task is “time well spent”.

If it is necessary to provide participants with assists, efficiency and effectiveness metrics shall be provided for both unassisted and assisted conditions, and the number and type of assists shall be included as part of the test results.

5.4.4.1 Effectiveness

Effectiveness relates the goals of using the product to the accuracy and completeness with which these goals can be achieved. Common measures of effectiveness include percent task completion, frequency of errors, frequency of assists to the participant from the testers, and frequency of accesses to help or documentation by the participants during the tasks. It does not take account of how the task goals were achieved, only the extent to which they were achieved. Efficiency relates the level of effectiveness achieved to the quantity of resources expended.

5.4.4.1.1 Completion rate

The completion rate is the percentage of participants who completely and correctly achieve each task goal. If goals can be partially achieved (e.g., by incomplete or suboptimum results), then it might also be useful to report the average goal achievement, scored on a scale of 0 to 100% based on specified criteria related to the value of a partial result. For example, a spell-checking task might involve identifying and correcting 10 spelling errors and the completion rate might be