
**Systems and software engineering —
Software product Quality
Requirements and Evaluation
(SQuaRE) — Common Industry Format
(CIF) for Usability: User requirements
specification**

*Ingénierie des systèmes et du logiciel — Exigences et évaluation de
la qualité des systèmes et logiciels (SQuaRE) — Format industriel
commun pour la facilité d'utilisation: Spécification des exigences de
l'utilisateur*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work 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 organizations, governmental and non-governmental, in liaison with ISO, 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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO 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).

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.

This document was prepared jointly by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction* and 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.

Introduction

Specifying user requirements in a consistent manner will assist those developing and acquiring interactive systems that are usable. The term "user requirements" is used in this document to refer to user-system interaction requirements (that specify the required interaction to achieve intended outcomes) and use-related quality requirements (expressed in terms of effectiveness, efficiency and satisfaction). It describes a set of content elements for user requirements specifications as part of a human-centred approach to design of an interactive system. A common industry format for a user requirements specification is intended to assist human-centred design teams in specifying user requirements for an interactive system.

The Common Industry Format (CIF) for usability is described in ISO/IEC TR 25060 and is part of the SQuaRE series (ISO/IEC 25000–ISO/IEC 2509x) on systems and software product quality requirements and evaluation.

Usability as used in the CIF standards refers to effectiveness, efficiency, and satisfaction as defined in ISO 9241-11, where it is defined as an outcome of use, rather than as a product quality which is an alternate use of the term also provided in ISO/IEC 25010.

CIF standards published or planned for include the following information items:

- usability test reports (see ISO/IEC 25062);
- context of use description (see ISO/IEC 25063);
- user needs report (see ISO/IEC 25064);
- user requirements specification (this document);
- usability evaluation report (see ISO/IEC 25066);

The CIF standards are part of the "Extension Division" of the ISO/IEC 25000 SQuaRE series. [Table 1](#) presents an overview of the structure and the contents of the SQuaRE series.

[ISO 25065:2019](#)

<https://standards.iteh.ai/catalog/standards/iso-25065-2019> **Table 1 — Organization of the SQuaRE series** <https://standards.iteh.ai/catalog/standards/iso-25065-2019>

SQuaRE architecture and sub-projects		
ISO/IEC 2503x: Quality requirement division	ISO/IEC 2501x: Quality model division	ISO/IEC 2504x: Quality evaluation division
	ISO/IEC 2500x: Quality management division	
	ISO/IEC 2502x: Quality measurement	
ISO/IEC 2505x–ISO/IEC 2509x: SQuaRE extension division		
— ISO/IEC 25051–2505x: Requirements for quality of Ready to Use Software Product (RUSP) division		
— ISO/IEC 2506x: Common Industry Format (CIF) for Usability division		

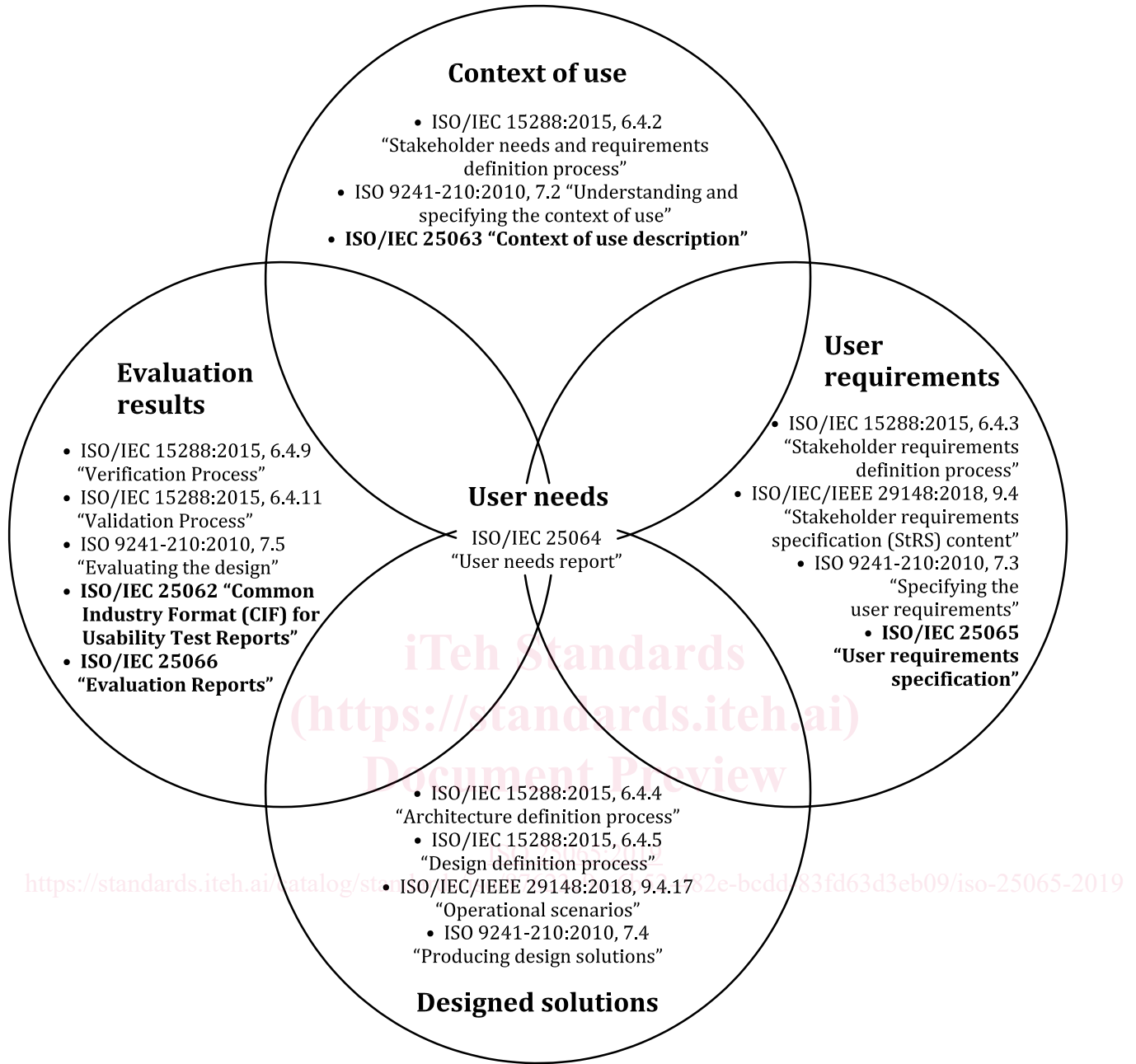


Figure 1 — Relationship of CIF documents to human-centred design in ISO 9241-210 and system lifecycle processes in ISO/IEC/IEEE 15288

Figure 1 illustrates the interdependence of these CIF documents with the outputs of human-centred design activities described in ISO 9241-210 as well as the corresponding system lifecycle processes described in ISO/IEC/IEEE 15288. Standards listed in bold represent CIF process outputs. The figure depicts the outputs of the activities as a set of intersecting circles. The circles overlap to represent that:

- human-centred design aims at satisfying user needs; and
- the activities are not separate, but rather, overlapping in time and scope; and
- the outcome of each activity provides the input to one or more other activities.

As each human-centred design activity can provide input to any other, there is no starting point, no endpoint, or linear process intended.

The human-centred design approach of ISO 9241-210 focuses on ensuring that systems are usable. Human-centred design is enabled by the identification and communication of all of the relevant types of information

NOTE ISO 9241-220 broadens the objectives of human-centred design to human-centred quality: usability, accessibility, user experience and avoidance of harm from use. Human-centred quality can be achieved by applying human-centred design throughout the lifecycle.

Human-centred design relies on user needs that are first identified based on the context of use analysis. User needs are documented in the user needs report (ISO/IEC 25064). The user needs report is an intermediate deliverable that links the context of use description (ISO/IEC 25063) containing information about the users, their tasks and the organizational and physical environment, to the user requirements. User requirements are, in turn, documented in the user requirements specification (ISO 25065). These information items are developed as part of the stakeholders requirements definition process described in ISO/IEC 15288.

The "designed solutions" activity focuses on designing user interaction that meets user requirements. This activity takes place during the architectural design, implementation, and integration processes described in ISO/IEC/IEEE 15288 and produces the information items "user interaction specification" and the "user interface specification".

The "evaluation results" activity starts at the earliest stages in the project, evaluating design concepts to obtain a better understanding of the user needs. Design solutions can be evaluated multiple times as the interactive system is developed and can produce various types of evaluation reports. Usability data, such as that described in ISO/IEC 25062, can support the ISO/IEC/IEEE 15288 validation process, which confirms that the system complies with the stakeholders requirements.

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Systems and software engineering — Software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for Usability: User requirements specification

1 Scope

This document provides a framework and consistent terminology for specifying user requirements. It specifies the common industry format (CIF) for a user requirement specification including the content elements and the format for stating those requirements.

NOTE 1 A user requirements specification is the formal documentation of a set of user requirements, which aids in the development and evaluation of usable interactive systems.

In this document, user requirements refers to:

- a) user-system interaction requirements for achieving intended outcomes (including requirements for system outputs and their attributes);
- b) use-related quality requirements that specify the quality criteria associated with the outcomes of users interacting with the interactive system and can be used as criteria for system acceptance.

NOTE 2 ISO/IEC 25030 introduces the concept of quality requirements. The use-related quality requirements in this document are a particular type of quality requirement.

The content elements of a user requirements specification are intended to be used as part of documentation resulting from the activities specified in ISO 9241-210, and from human centred design processes, such as those in ISO 9241-220.

This document is intended to be used by requirements engineers, business analysts, product managers, product owners, and people acquiring systems from third parties.

The CIF series of standards addresses usability-related information (as described in ISO 9241-11 and ISO/IEC TR 25060).

NOTE 3 In addition to usability, user requirements can include other perspectives, such as human-centred quality introduced in ISO 9241-220, and other quality perspectives presented in ISO/IEC 25010, ISO/IEC TS 25011, and ISO/IEC 25030.

NOTE 4 While this document was developed for interactive systems, the guidance can also be applied in other domains.

This document does not prescribe any kind of method, lifecycle or process. The content elements of a user requirements specification can be used in iterative development which includes the elaboration and evolution of requirements (e.g. as in agile development).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 Terms related to user requirements

3.1.1 requirement

condition or capability that must be met or possessed by a system, system component, product, or service to satisfy an agreement, standard, specification, or other formally imposed documents

Note 1 to entry: Formally imposed documents can include User needs reports.

Note 2 to entry: This definition is used in this document because it explicitly differentiates between user needs and user requirements which the ISO/IEC/IEEE 12207 definition does not explicitly differentiate.

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.3431/2, modified — The Notes to entry have been added.]

3.1.2 quality requirement

requirement (3.1.1) for quality properties or attributes of a product, data or service that satisfy needs which ensue from the purpose for which that product, data or service is to be used

[SOURCE: ISO/IEC DIS 25030:2018, 4.16, modified — Note 1 to entry has been deleted.]

3.1.3 user

person who interacts with a system, product or service

Note 1 to entry: Users of a system, product or service include people who operate the system, people who make use of the output of the system and people who support the system (including providing maintenance and training).

Note 2 to entry: This term corresponds to the definition "direct user" that is found in ISO/IEC 25010.

[SOURCE: ISO 9241-11:2018, 3.1.7, modified — Note 2 to entry has been added]

3.1.4 stakeholder

individual or organization having a right, share, claim or interest in a system or in its possession of characteristics that meet their needs and expectations

Note 1 to entry: Stakeholders can include: users, purchasers, systems owners or managers and people who are indirectly affected by the operation of a system, product or service.

Note 2 to entry: Different stakeholders can have different needs, requirements or expectations.

[SOURCE: ISO/IEC/IEEE 15288:2015, 4.1.44, modified — The Example has been removed, Note 1 to entry has been replaced and Note 2 to entry has been added.]

3.1.5 user group

subset of intended *users* (3.1.2) who are differentiated from other intended users by characteristics of the users, *tasks* (3.1.7) or environments that can influence *usability* (3.3.1)

[SOURCE: ISO 9241-11:2018, 3.1.8]

3.1.6**context of use**

combination of *users* (3.1.2), *goals* (3.1.6) and *tasks* (3.1.7), resources, and environment

Note 1 to entry: The "environment" in a context of use includes the technical, physical, social, cultural and organizational environments.

Note 2 to entry: This can apply to an existing context of use or an intended context of use.

[SOURCE: ISO 9241-11:2018, 3.1.15, modified — Note 2 to entry has been added]

3.1.7**goal**

intended outcome

[SOURCE: ISO 9241-11:2018, 3.1.10]

3.1.8**task**

set of activities undertaken to achieve a specific *goal* (3.1.6)

Note 1 to entry: These activities can be physical, perceptual and/or cognitive.

Note 2 to entry: While goals are independent of the means used to achieve them, tasks describe particular means of achieving goals.

[SOURCE: ISO 9241-11:2018, 3.1.11]

3.1.9**user need**

prerequisite identified as necessary for a *user* (3.1.2), or a set of users, to achieve an intended outcome, implied or stated within a specific *context of use* (3.1.5)

EXAMPLE 1 A presenter (user) needs to know how much time is left (prerequisite) in order to complete the presentation in time (goal) during a presentation with a fixed time limit (context of use).

EXAMPLE 2 An account manager (user) needs to know the number of invoices received and their amounts (prerequisite), in order to complete the daily accounting log (goal) as part of monitoring the cash flow (context of use).

Note 1 to entry: A user need is independent of any proposed solution for that need.

Note 2 to entry: User needs are identified based on various approaches including interviews with users, observations, surveys, evaluations, expert analysis, etc.

Note 3 to entry: User needs often represent gaps (or discrepancies) between what should be and what is.

Note 4 to entry: User needs are transformed into *user requirements* (3.1.10) considering the context of use, user priorities, trade-offs with other system requirements and constraints.

[SOURCE: ISO/IEC 25064:2013, 4.19, modified — The expression "intended outcome" has been changed to "goal" in Examples 1 and 2.]

3.1.10**user requirements**

set of requirements (3.1.1) for use that provide the basis for design and evaluation of *interactive systems* (3.2.1) to meet identified *user needs* (3.1.8)

Note 1 to entry: User requirements are derived from user needs and capabilities in order to allow the user to make use of the system in an effective, efficient, safe and satisfying manner.

Note 2 to entry: User requirements are not requirements on the users.