**DRAFT INTERNATIONAL STANDARD** ISO/IEC DIS 25063

ISO/IEC JTC **1**

Secretariat: **ANSI**

Voting begins on
**2011-09-29**

Voting terminates on
**2012-02-29**

# Systems and software engineering — Systems and software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for usability: Context of use description

*Ingénierie des systèmes et du logiciel — Exigences de qualité et évaluation des systèmes et du logiciel (SQuaRE) — Format industriel commun (CIF) pour l'utilisabilité: Description du contexte d'utilisation*

ICS 35.080

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# Foreword

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ISO/IEC 25063 was prepared by Technical Committee ISO/TC JTC1, *Information Technology*, Subcommittee SC SC7, *Software and System Engineering in conjunction with* ISO/TC 159 *Ergonomics* SC 4 *Human-System Interaction*.

## Introduction

The human-centred design approach of ISO 9241-210 is well established and focuses specifically on making systems usable. Usability can be achieved by applying human-centred design and testing throughout the lifecycle. In order to enable a human-centred approach to be adopted, it is important that all the relevant types of information related to usability (information items) are identified and communicated. This identification and communication enables the usability of a system to be designed and tested.

This International Standard provides a framework and consistent terminology for describing the context of use of an interactive system. It is intended to assist developers in documenting and communicating usability-related information through the system development life-cycle.

The Common Industry Format (CIF) for Usability family of International Standards is described in ISO TR 25060 and is part of the SQuaRE series (ISO/IEC 25000 – ISO/IEC 25099) of standards on systems and software product quality requirements and evaluation.

The CIF family of standards uses definitions that are consistent with the ISO 9241 series of standards (Ergonomics of human system interaction), as this is the terminology that is normally used for this subject matter. In some cases these definitions differ from those in ISO/IEC 25000.

CIF standards are planned for the following information items:

- Context of use description (25063)
- User needs report (25064)
- User requirements specification (25065)
- User interaction specification
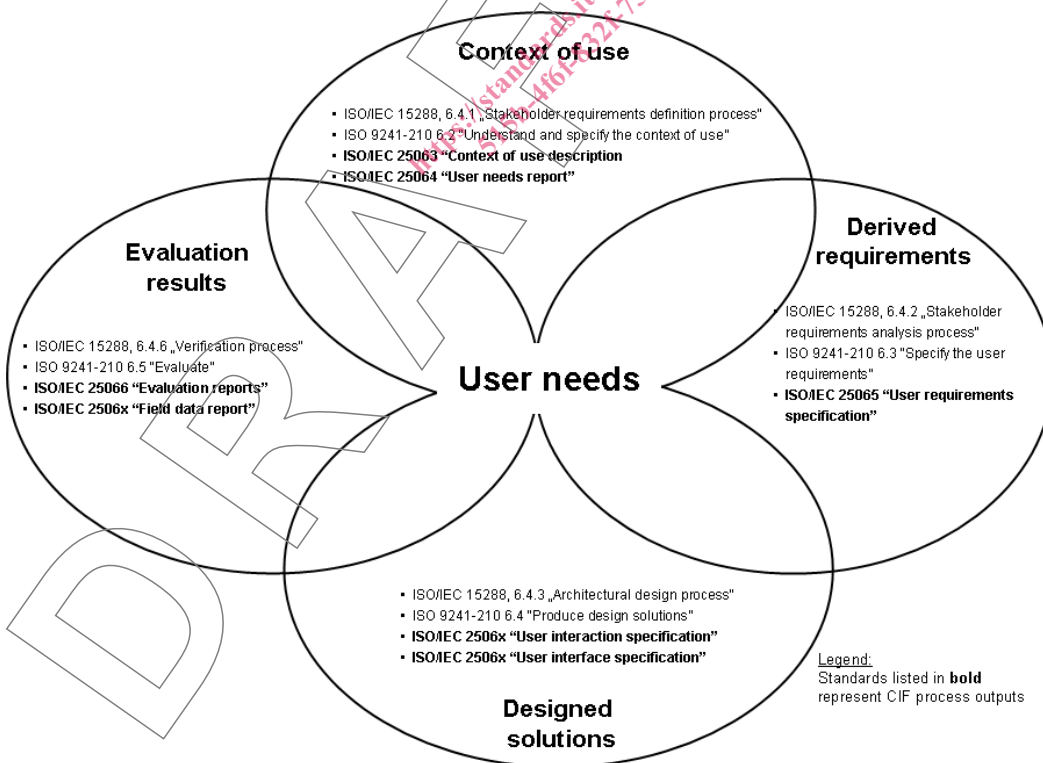- User interface specification
- Usability evaluation report (25066)



**Figure 1 Relationship of CIF documents to user centred design in ISO 924-210 and system lifecycle processes in ISO/IEC 15288**

Figure 1 illustrates the interdependence of these information items with the human-centred design activities described in ISO 9241-210 as well as the corresponding System Life Cycle processes described in ISO/IEC 15288. The figure depicts the activities as a set of intersecting circles. The circles overlap to represent that 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.

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), which is an intermediate deliverable that links the Context of Use Description (ISO/IEC 25063) that contains Information about the users, their tasks and the organizational and physical environment, to the user requirements. These items are developed during the Stakeholders Requirements Definition Process described in ISO/IEC 15288.

The "Produce design 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 15288 and produces the information items "User Interaction Specification" and the "User Interface Specification".

The "Evaluate" 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 being developed, and can produce various types of evaluation report, and usability data such as that described in ISO/IEC 25062 can support the ISO/IEC 15288 validation process that confirms that the system complies with the stakeholders requirements.

# Systems and software engineering — Systems and software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for Usability: Context of Use Description

## 1    Scope

This International Standard specifies the contents of both high-level and detailed descriptions of context of use for an existing, intended, designed or implemented system.

The context of use description is applicable to software and hardware systems, products or services (excluding generic products, such as a display screen or keyboard). The description of the context of use is intended to be used as part of system-level documentation resulting from development processes such as those in ISO 9241-210 and ISO/IEC JTC1/SC7 process standards.

This International Standard does not prescribe any kind of method, lifecycle or process. To ensure that this information item can be used within the broadest range of process models and used in combination with other information items, the descriptions are given in the format defined in ISO/IEC 15289 and ISO/IEC 15504-6.

The context of use information item can be integrated in any type of process models. For the purpose of establishing process models, ISO/IEC 24774 and ISO/IEC 15504-2 specify the format and conformance requirements for process models respectively. In addition ISO/IEC 15289 defines the types and content of information items developed and used in process models for system and software lifecycle management. ISO/IEC 15504-5 and 6 define work products, including information items, for the purpose of process capability assessment. Process models and associated information items for human-centred design of interactive systems are contained in ISO TR 18529 and ISO PAS 18152 respectively.

This International Standard also describes the rationale to generate context of use descriptions, and identifies the intended users of context of use descriptions. An exemplary process to create context of use descriptions is given Annex B.

## 2    Conformance

A description of the context of use conforms to this International Standard if it contains all the required elements specified in clause 6.  An explanation of the basis for the judgements made in 6.1, 6.3.2.1, 6.3.2.2, 6.3.2.3, 6.4.2, 6.5.1, 6.5.2, 6.6.3 and 6.6.4 shall be provided.

## 3    Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document, (including any amendments) applies.

*None?*

## 4    Terms and Definitions

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

**4.1**
**accessibility**
extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use

NOTE    Context of use includes direct use or use supported by assistive technologies.

[ISO/FDIS 26800]

**4.2**
**context of evaluation**

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

[ISO 20282-2:2006, definition **4.3**]

**4.3**
**context of use**
users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a system, product or service is used

NOTE       Based on ISO 9241-11:1998.

**4.4**
**effectiveness**
accuracy and completeness with which users achieve specified goals

[ISO 9241-11:1998]

**4.5**
**efficiency**
resources expended in relation to the accuracy and completeness with which users achieve goals

ISO 9241-11:1998]

**4.6**
**goal**
intended outcome

[ISO 9241-11:1998]

**4.7**

**human-centred design**

approach to system design and development that aims to make interactive systems more usable by focussing on the use of the system; applying human factors, ergonomics and usability knowledge and techniques

NOTE 1    The term "human-centred design" is used rather than "user-centred design" in order to emphasize that this standard also addresses impacts on a number of stakeholders, not just those typically considered as users.  However, in practice, these terms are often used synonymously.

NOTE 2    Usable systems can provide a number of benefits including improved productivity, enhanced user wellbeing, avoidance of stress, increased accessibility, and reduced risk of harm.

[ISO 9241-210:2010]

**4.8**

**information item**

a separately identifiable body of information that is produced and stored for human use during a system or software life cycle

[ISO/IEC 15289:2006]

**4.9**

**interactive system**

combination of hardware, software and /or services that receives input from and communicates output to users

NOTE      This includes, where appropriate, packaging, branding, user documentation, on-line help, support and training.

[ISO 9241-210:2010]

**4.10**

**persona**

representation of a type of user that includes a concise summary of general characteristics of the user, goals and tasks, pain points, and environmental conditions

**4.11**

**prototype**

<interactive system> representation of all or part of an interactive system, that, although limited in some way, can be used for analysis, design and evaluation

NOTE      A prototype may be as simple as a sketch or static mock-up or as complicated as a fully functioning interactive system with more or less complete functionality.

[ISO 9241-210:2010]

**4.12**

**requirement**

a 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      Requirements include the quantified and documented needs, wants, and expectations of the sponsor, customer, and other stakeholders.

[ISO/IEC 24765:2010]

**4.13**

**satisfaction**

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

[ISO 9241-11:1998]

**4.14**
**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

[ISO/IEC 15288:2008]

**4.15**
**system**
combination of interacting elements organized to achieve one or more stated purposes

NOTE 1    A system may be considered as a product or as the services it provides.

NOTE 2    In practice, the interpretation of its meaning is frequently clarified by the use of an associative noun, e.g. aircraft system. Alternatively the word system may be substituted simply by a context dependent synonym, e.g. aircraft, though this may then obscure a system principles perspective.

[ISO/IEC 15288:2008, 4.31]

**4.16**
**task**
activities required to achieve a goal

[ISO 9241-11:1998]

**4.17**
**usability**
extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

[ISO 9241-210]

**4.18**
**user**
person who interacts with a system, product or service

NOTE       A person who uses the output or service provided by a system, such as a bank customer who visits a branch, receives a paper statement, or carries out telephone banking using a call centre, can be considered a user.

[ISO FDIS 26800:2011]

**4.19**
**user experience**
a person's perceptions and responses that result from the use and/or anticipated use of a product, system or service

NOTE 1    User experience includes all the users' emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments that occur before, during and after use.

NOTE 2    User experience is a consequence of brand image, presentation, functionality, system performance, interactive behaviour, and assistive capabilities of the interactive system; the user's internal and physical state resulting from prior experiences, attitudes, skills and personality; and the context of use.

NOTE 3    Usability, when interpreted from the perspective of the users' personal goals, can include the kind of perceptual and emotional aspects typically associated with user experience.   Usability criteria can be established so as to assess aspects of user experience.

[ISO 9241-210:2010]

**4.20**
**user interface**
all components of an interactive system (software or hardware) that provide information and controls for the user to accomplish specific tasks with the interactive system

[ISO 9241-110:2006]

**4.21**
**user requirements**
**usage requirements**
requirements for use that provide the basis for design and evaluation of interactive systems to meet identified user needs.

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

NOTE 2    User requirements specify the extent to which user needs and capabilities are to be met when using the system. They are not requirements on the users.

NOTE 3    In software-engineering terms, user requirements comprise both "functional" and "non-functional" requirements based on user needs and capabilities.

[ISO/IEC TR 25060:2010]


# 5    Purposes of context of use descriptions

## 5.1    Context of use in relation to Human-Centred Design and other CIFs

The description of the context of use provides essential common information for the other information items that are to be produced relating to human centred design, and helps maintain a human-centred design focus within the project.
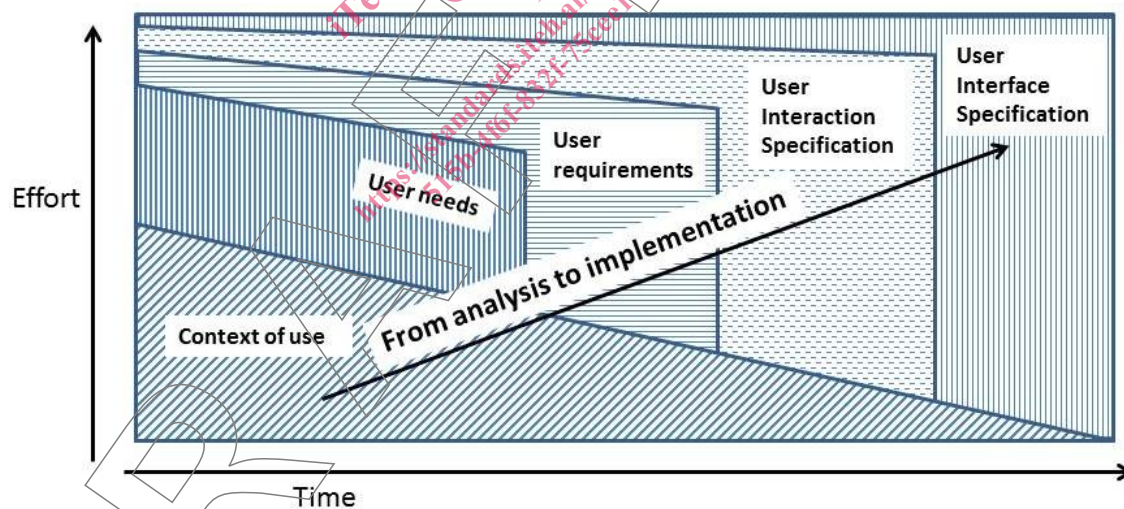


**Figure 2 – Relationship between the information items**

Figure 2 depicts that each information item builds on the contents of previous items, and can result in changes or additions to previous items. This starts with context of use information, which can be expanded upon by detailing User Needs information. Further enrichment of context of use information is achieved by specifying User Requirements, User Interaction, and the User Interface. Figure 2 gives an indication of the relative amount of effort that might be expended in collecting and refining information for each of the information items, as development moves from analysis to implementation. The results of usability evaluation are reported separately.  According to ISO 9241-210, the generation of information items and also the information therein are the result of iterative activities. Therefore, the information items are interdependent and can be regarded as a repository of information that is established during human-centred design.