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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

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Foreword

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

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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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*.

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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 elements of the context of use are a useful framework for defining, describing and thinking about the boundary of a system, and addressing influences and affects across this boundary.

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.

CIF standards are planned for the following information items:

- Context of use description (ISO/IEC 25063);
- User needs report (ISO/IEC 25064);
- User requirements specification;
- User interaction specification;
- User interface specification;
- Usability evaluation report;
- Field data report;

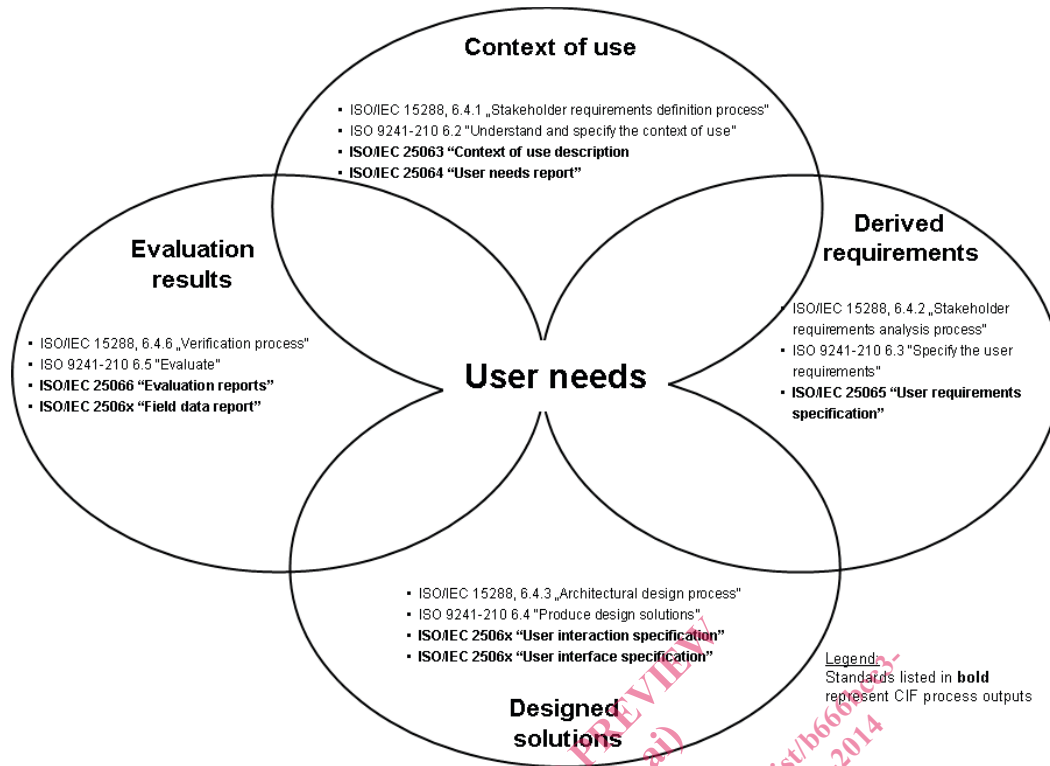


Figure 1 Relationship of CIF documents to user centred design in ISO 924-210 and system lifecycle processes in ISO/IEC 15288

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 areas. 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.

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Systems and software engineering — Systems and software product Quality Requirements and Evaluation (SQuRE) — 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 JTC 1/SC 7 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 uses the classification in ISO/IEC 15289 and ISO/IEC 15504-6.

The context of use information item can be integrated into any type of process models.

NOTE 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 TS 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 procedure to create context of use descriptions is given in A.4.

This International Standard does not recommend any specific format for documenting the context of use.

2 Conformance

A description of the context of use conforms to this International Standard if it contains all the required elements specified in clause 5. An explanation of the basis for the judgements made in 5.1, 5.3.2.2, 5.3.2.3, 5.3.2.4, 5.4.2, 5.4.3, 5.5.1, 5.6.2, 5.6.3 and 5.6.4 **shall** be provided.

3 Terms and Definitions

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

3.1

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 to entry: Context of use includes direct use or use supported by assistive technologies.

[SOURCE: ISO 26800:2011, 2.1]

3.2

context of evaluation

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

[SOURCE: ISO 20282-2:2006, 4.3]

3.3

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

[SOURCE: ISO 9241-11:1998, 3.5, with "product" replaced by " system, product or service".]

3.4

effectiveness

accuracy and completeness with which users achieve specified goals

[SOURCE: ISO 9241-11:1998, 3.2]

3.5

efficiency

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

[SOURCE: ISO 9241-11:1998, 3.3]

3.6

goal

intended outcome

[SOURCE: ISO 9241-11:1998, 3.8]

3.7

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

[SOURCE: ISO 9241-210:2010, 2.7]

3.8

information item

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

[SOURCE: ISO/IEC 15289:2006, 5.11]

3.9

interactive system

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

Note to entry: This includes, where appropriate, packaging, branding, user documentation, on-line help, support and training.

[SOURCE: ISO 9241-210:2010, 2.8]

3.10 persona

representation of a type of user that includes a concise summary of the characteristics of the user that are most informative to the design or illustrative of specific user requirements

Note to entry: A persona typically includes behaviour patterns, goals, skills, attitudes, and environment, with a few fictional personal details to make the persona a realistic character.

3.11 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 to entry: Requirements include the quantified and documented needs, wants, and expectations of the sponsor, customer, and other stakeholders.

[SOURCE: ISO/IEC 24765:2010, 3.2506]

3.12 satisfaction

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

[SOURCE: ISO 9241-11:1998, 3.4]

3.13 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

[SOURCE: ISO/IEC 15288:2008, 4.29]

3.14 system

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

Note 1 to entry: A system may be considered as a product or as the services it provides.

Note 2 to entry: 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.

[SOURCE: ISO/IEC 15288:2008, 4.31]

3.15 task

activities required to achieve a goal

[SOURCE: ISO 9241-11:1998, 3.9]

3.16 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

[SOURCE: ISO 9241-210, 2.13]

3.17

user

person who interacts with a system, product or service

Note to entry: 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.

[SOURCE: ISO 26800:2011, 2.10]

3.18

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 to entry: 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 to entry: 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 to entry: 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.

[SOURCE: ISO 9241-210:2010, 2.15]

3.19

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

[SOURCE: ISO 9241-110:2006, 3.9]

3.20

user need

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

[SOURCE: ISO DIS 25064]

3.21

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 to entry: 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 to entry: 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 to entry: In software-engineering terms, user requirements comprise both "functional" and "non-functional" requirements based on user needs and capabilities.

[SOURCE: ISO/IEC TR 25060:2010, 2.21]