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Information technology — User interface accessibility —

Part 1: User accessibility needs

Technologies de l'information — Accessibilité de l'interface utilisateur —

Partie 1: Besoins d'accessibilité de l'usager

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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.

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 document 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 and IEC 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 by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

This first edition cancels and replaces the Technical Report ISO/IEC TR 29138-1:2009, which has been technically revised.

Compared to the previous edition, all clauses in the document have been technically revised. Annex C provides a full comparison of the content with the first edition.

A list of all parts in the ISO/IEC 29138 series can be found on the ISO website.

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

It is important for the whole of society that all people, regardless of their age, size or ability, have access to the broadest range of systems. Issues of accessibility to, and usability of, systems have become more critical as recognition of the number of people (such as older persons, children, persons with reduced abilities and persons with disabilities) with diverse user accessibility needs has increased, technology has diversified and it has become increasingly necessary to use technology to participate fully in life.

The number of people using information and communications technology (ICT) products and services, which combine hardware, software, and network technologies, is increasing, as is the variety of ICT products and services. Our everyday lives are filled with such products and services. Currently available ICT products and services, however, are not always accessible. Typically, the people most excluded by poor accessibility of products and services are those with disabilities and those with limitations due to age. However, they are not the only ones who experience difficulty in operating ICT products, such as personal computers (PCs). It is essential to improve ICT accessibility, so that all people with whatever user accessibility needs can have access to ICT products and services, leading to an inclusive e-society.

This document identifies a set of user accessibility needs that can be used to understand and improve the accessibility of ICT and other systems for diverse users in diverse contexts of use. It recognizes that different users will have different combinations of needs including different combinations of user accessibility needs. By being as comprehensive as possible (at the time of publication), it aims to identify a diverse set of user accessibility needs that, if met, can lead to accessibility for these diverse users. It also recognizes that, as technologies evolve along with increases in our understanding of accessibility, further user accessibility needs might be uncovered. However, this document will still provide the major portion of the total set of all user accessibility needs.

This set of user accessibility needs has evolved from the Technical Report ISO/IEC TR 29138-1:2009 and from the accessibility goals and high-level user accessibility needs of ISO/IEC Guide 71:2014. ISO/IEC TR 29138-1 was developed from the original user needs summary submitted to ISO/IEC JTC1/SWG-Accessibility by the Trace R&D Center of the University of Wisconsin-Madison, developed under funding from the National Institute on Disability Independent Living and Rehabilitation Research (NIDILRR), under grant # H133E030012. This set of user accessibility needs also takes into account accessibility guidance from a number of other ISO and ISO/IEC standards as well as from additional sources.

This document is intended for a wider audience than the previous Technical Report (which was only addressed to standards developers). This expanded audience includes system and service developers and other persons responsible for accessibility.

The set of user accessibility needs contained in this document can be especially useful in identifying needs that might be missing in the requirements of existing accessibility regulations and standards. Consideration of this set of user accessibility needs can lead to greater accessibility in the systems to which they are applied in every domain.

Information technology — User interface accessibility —

Part 1:
User accessibility needs

1 Scope

This document identifies a collection of user accessibility needs that diverse users have of ICT systems to make these systems accessible to them. Each user accessibility need might be required of a system by an individual. Different users can have different sets of user accessibility needs in different contexts.

While this set of user accessibility needs was developed for the domain of ICT, many of the user accessibility needs in this set also apply in other domains.

This document does not provide requirements or specific processes and methods for the application and evaluation of user accessibility needs. However, it could inform the development of such requirements (see 5.4).

This document is not designed for certification purposes or regulatory or contractual use.

The user accessibility needs in this document are intended to inform and encourage those responsible for accessibility to go beyond the minimum provisions of accessibility legislation and regulations.

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 https://www.electropedia.org/

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 user needs, characteristics and capabilities to achieve identified goals in identified contexts of use

Note 1 to entry: Context of use includes direct use or use supported by assistive technologies.

[SOURCE: ISO 9241-112:2017, 3.15]

3.2
assistive technology
hardware or software that is added to or incorporated within an ICT system that increases accessibility for an individual

[SOURCE: ISO 9241-171:2008, 3.5 — modified to reference the ICT domain.]

3.3
information/communication technology
ICT
technology for gathering, storing, retrieving, processing, analysing and transmitting information

[SOURCE: ISO 9241-20:2008, 3.4]

3.4
system
product, service, or built environment or any combination of them with which the user interacts

[SOURCE: ISO/IEC Guide 71:2014, 2.1]

3.5
user
individual who accesses or interacts with a system

[SOURCE: ISO/IEC Guide 71:2014, 2.2]

3.6
diverse users
individuals with differing abilities and characteristics or accessibility needs

[SOURCE: ISO/IEC Guide 71:2014, 2.3]

3.7
context of use

physical and social environments in which a system is used, including users, tasks, equipment and materials

[SOURCE: ISO/IEC Guide 71:2014, 2.7]

3.8
diverse contexts
differing contexts of use and differing economic, cultural and organizational conditions

[SOURCE: ISO/IEC Guide 71:2014, 2.8]

3.9
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

EXAMPLE 1 A presenter (user) needs to know how much time is left (prerequisite) in order to complete the presentation in time (intended outcome) 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 (intended outcome) 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 considering the context of use, user priorities, trade-offs with other system requirements and constraints.

[SOURCE: ISO/IEC 25064:2013, 4.19]

3.10
user accessibility need
user need related to features or attributes that are necessary for a system to be accessible

Note 1 to entry: User accessibility needs vary over time and across contexts of use.

[SOURCE: ISO/IEC Guide 71:2014, 2.4]

Note 2 to entry: User accessibility needs are transformed into user requirements considering the context of use, user priorities, trade-offs with other system requirements and constraints.

3.11
user interface component
features or attributes of a system with which a user can interact

3.12
actionable user interface component
actionable component
user interface component that can receive input from a user

Note 1 to entry: All actionable components are intended to do something with the input that they receive, whether it is to process it, pass it on to some other component of the system, and/or provide it back to the user.

3.13
non-actionable user interface component
non-actionable component
user interface component that only provides output to the user and that cannot receive input from the user

3.14
multiple means of presentation
different ways of presenting information

Note 1 to entry: Presenting information in different ways can improve the accessibility of systems.

[SOURCE: ISO/IEC Guide 71:2014, 2.13]

3.15
perceive
recognize the existence of something

3.16
understand
recognize the meaning of something

4 Accessibility goals

ISO/IEC Guide 71 identifies the following accessibility goals:

1) **suitability for the widest range of users:** A system is suitable for the widest range of users if it meets the needs of diverse users in diverse contexts;

2) **conformity with user expectations:** A system conforms to user expectations if it is predictable based on the user's past experience, the context of use, laws and standards, and/or commonly accepted conventions;

3) **support for individualization:** A system supports individualization if its components, functions or operations can be tailored to meet the needs of individual users;

4) **approachability:** A system is approachable if diverse users can overcome any physical or psychological barriers and physically or remotely access it to accomplish the task;

5) **perceivability:** A system is perceivable if diverse users in diverse contexts can sense the information and functionalities it presents;

6) **understandability:** A system is understandable if its information and functionalities are interpretable by diverse users;

7) **controllability:** A system is controllable if the user is able to initiate and complete the interaction(s) required to accomplish the task;

8) **usability:** A system is usable if it supports diverse users in their diverse contexts to accomplish their tasks with effectiveness, efficiency and satisfaction;

9) **error tolerance:** A system has error tolerance if despite predictable errors, diverse users can complete the intended task or activity with either no, or minimal, corrective action or negative consequences;

10) **equitable use:** A system provides equitable use if it allows diverse users to accomplish tasks in an identical manner whenever possible or in an equivalent manner when an identical manner is not possible;

11) **compatibility with other systems:** A system provides compatibility if it allows diverse users to use other systems as a means to interact with it to accomplish the task.

These goals are not mutually exclusive, but used together they can identify a broad set of user accessibility needs. ISO/IEC Guide 71 also identifies a number of typical user accessibility needs that correspond to individual usability goals that can be used as a starting point for the identification of a more comprehensive set of user accessibility needs.

5 User accessibility needs and related information

5.1 General

5.1.1 Needs

A user need is something an individual requires of a system. User needs focus on the internal and external functionality of a system, without prescribing how this functionality will be implemented. Identifying user needs is an important component of developing designs intended to support accessibility. Needs for internal functionality of a system are typically specified in terms of the tasks that the system is intended to assist the user with. Needs for external functionality of a system typically include needs for: accessibility, usability, security, privacy, and similar aspects of using the system.

NOTE 1 User accessibility needs are just some of the total set of user needs that a system might be intended to meet.

NOTE 2 For ease of readability, user accessibility needs will be referred to throughout this document as "needs" without always being qualified as "user accessibility needs". The complete term "user accessibility need" will be reserved for situations where extra emphasis is important. Whenever the more general case of all user needs is discussed, the term "user needs" will be explicitly used.

The user accessibility needs identified in this document are generic and are not tied to any particular system or context of use. They are a collection of the various user accessibility needs that apply to most ICT systems in most contexts of use. It is up to individuals using these user accessibility needs to determine any system and context of use where they do not apply.

NOTE 3 The user accessibility needs are described in a more general format than the user needs considered in ISO/IEC 25064, which are specific to a particular system and a particular context of use.

The user accessibility needs in this document do not specify how to meet them. However, examples or instances are provided for many of them illustrating how they can be met.

While the expectation is that user accessibility needs must be met for the system to be accessible to individuals, the user accessibility needs in this document are not expressed as user requirements. User requirements go beyond user needs to also identify criteria (how much is needed) and contexts (where the need is needed). However, the user accessibility needs in this document can form an important input to identifying and creating user requirements (see 5.4.4).

5.1.2 Some users need

The needs in this document are user accessibility needs because "Some users need" them for a system to be accessible to them.

These needs are not necessarily shared among all users. Diverse users can have a large number of differing needs. The user accessibility needs of some users in some contexts might not be needed for different users or for the same users in different circumstances.

The needs of some individual users might appear to conflict with the needs of other individual users. Thus while some users need "5-1-3 to have information presented auditorially" some other users need "5-1-4 to have audio information available in other modalities". However, these two needs are parts of a higher level need "5-1 to use a specific sensory modality (or a set of specific modalities) to perceive information" that does not conflict with other needs.

Rather than only focusing on commonly held needs, it is important to ensure that the user accessibility needs of diverse users are accommodated in diverse ways.

5.2 The organization of this set of user accessibility needs

5.2.1 Organization based on accessibility goals

The user accessibility needs in this document are organized in categories that correspond to the accessibility goal (from ISO/IEC Guide 71) to which they appear to be most relevant. However, it is recognized that since the goals can overlap, individual needs might relate to more than one goal. In general, each user accessibility need is presented under only a single accessibility goal, since understanding and using the needs is more important than categorizing them. However, in some cases similar or overlapping needs are presented in different categories.

Where a large number of user accessibility needs are associated with an accessibility goal (i.e. with needs relating to perceivability, understandability, and controllability), those needs are also further organized under high level needs. The emphasis of this organization of needs remains on recognizing the various needs of individuals and not on the categorization of those needs.

Annex C provides the mapping between the previous Technical Report (ISO/IEC TR 29138-1:2009) and this document.

5.2.2 Heuristics for the organization of this set of user accessibility needs

While there are many potential user accessibility needs, this document recognizes the importance of identifying a limited set of needs that can be widely applied.

a) Needs can be differentiated from instances and examples (of a need) based on the following general heuristics:

   1) a need is not dependent on a particular technology or context unless the technology is essential to the need;

   2) an instance (of a need) identifies implementation refinement of a need in some particular context;

3) an example (of a need) identifies one way in which instances or needs are met. Examples are singular — that is each example cannot be implemented in more than one way.

b) Due to the large number of needs associated with the goals of perceivability, understandability and controllability:

1) needs related to those goals are organized at two levels, with the higher level serving as a category of needs for items at the lower level;

2) both high level needs and the lower level needs they categorise are expressed and treated as needs;

3) only the lower level needs have instances and examples presented with them.

c) Further heuristics were used to determine the information to be provided with each of these:

1) because of their general nature, most needs (except some needs that are used to categorize more detailed needs) benefit from being described;

2) a need might have associated instances;

3) a need might have associated examples;

4) an instance might have associated examples;

5) an instance might have associated instances.

5.3 Detailed information on needs

5.3.1 The statement of the need

User accessibility needs have been worded to focus on what is needed, without prescribing in detail how the need is to be met. Clauses are named with a statement of the user accessibility need that can be prefixed with the qualifier, "some users need".

User accessibility needs are focused on needs that individual users have of a system rather than solutions imposed upon the individual user by the system or environment. However, whether or not a particular user has a particular need at a particular time can be influenced by the context of use, which includes the current condition of the environment.

NOTE The terms "user need" and "user accessibility need" are based on identifying something that "**some users need**" as discussed in 5.1.2.

5.3.2 Need identifier

Each of the needs is provided with an identifier that is composed of a number that identifies both the accessibility goal and the location of the individual need within the accessibility goal.

5.3.3 Description of the need

While the wording of individual needs has been made as clear as possible, most needs are provided with a further discussion (labelled "Description") to help clarify their intent and scope.

The description of each need can include up to three functional parts, respectively:

a) the focus of the need: more detail than the simple one line description but still fairly high level to aid understanding;

b) an elaboration that explains the need in more detail;

c) the consequences for the user if the need is not met in the context of use.

NOTE Sometimes these different parts are combined into one or two parts.

5.3.4 Instances of the need

An instance is a refinement of a need. Typically a need can have several instances. In some cases those instances will identify contexts in which the need might apply. The set of instances associated with a need is not necessarily all of the instances that could be associated with that need. Instances of a need are worded as needs, because they are specific variations of a more general need. Thus, instances do not proscribe specific implementations of a need.

Instances are identified by a letter that can be added to the identifier of the need to which they apply (e.g. instance "a" of need "1-1" can be fully identified as "1-1-a").

5.3.5 Examples of the need

In this document examples of some needs are used to make those needs clearer by showing how a system might implement functions or attributes to meet them. It is recognized that a single function or attribute might implement more than one need.

These examples are not recommendations of the preferred way of addressing the need.

5.3.6 Examples of an instance

In this document examples of instances are provided to further illustrate implementations of the need of which they are instances. Such an example might typically illustrate an implementation in a particular context.

These examples are not recommendations of the preferred way to implement those instances.

5.3.7 Short versions of the needs and their instances

Annex A provides a short list of just the needs and their identifiers.

Annex B provides a short list of the needs and instances and their identifiers.

5.4 Applying the needs

5.4.1 Users and uses of the set of needs

This set of user accessibility needs can be used by many different stakeholders including:

— developers of information and communications technology products and services;

— procurers of information and communications technology products and services;

— organizations providing accessibility both internally and externally;

— users and organizations that represent them;

— accessibility advocates and researchers;

— standards developers working on standards for systems that will interact with human users.

5.4.2 General activities involving user needs

The needs presented in this document are broadly applicable to ICT systems and have been worded as generic rather than system specific needs. These user accessibility needs could be one starting point towards achieving accessibility in ICT systems. Another possible starting point is user involvement. The identification of specific needs, the development of system requirements based on needs, and the