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ISO/IEC JTC 1 Special Working Group on Accessibility (SWG-A)

JTC 1 SWG-A N 339

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Title: **Text for DTR Ballot: ISO/IEC DTR 29138-1, Information Technology - Accessibility Considerations for People with Disabilities - Part 1: User Needs Summary**

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Requested Action: **SWG-A 2008 Tokyo Resolution 11: Progression of ISO/IEC TR 29138-1**

The ISO/IEC TR 29138-1 BRM accepts the disposition of comments contained in SWG-A N 334 and reflected in the updated version of ISO/IEC TR 29138-1. The ISO/IEC TR 29138-1 BRM requests that the JTC 1 SWG on Accessibility Secretariat forward the reviewed and edited version of the TR (SWG-A N 339) to the JTC 1 Secretariat for a three month DTR ballot.

Unanimous

ISO/IEC TC JTC1/SC

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Secretariat: ANSI

Information Technology — Accessibility Considerations for People with Disabilities — Part 1: User Needs Summary

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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.

ISO/IEC TR 29138-1 was prepared by Technical Committee ISO/TC JTC1, *Information Technology*, Subcommittee SC , .

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

ISO/IEC TR 29138 consists of the following parts, under the general title *Information Technology — Accessibility Considerations for People with Disabilities*:

— *Part 1: User Needs Summary*

— *Part 2: Standards Inventory*

— *Part 3: Guidance on User Needs Mapping*

Introduction

ISO/IEC JTC 1 believes that the work in the area of Information Communication Technology (ICT) standardization for accessibility is a major undertaking, encompassing many global, regional and local interests. Additionally, there are significant standards efforts taking place in ISO, IEC, ITU and the national and regional standards bodies as well as various consortia/fora and user groups.

ISO/IEC JTC 1 established a Special Working Group on Accessibility (SWG-A) in 2005. The SWG-A is an open forum where everyone can participate. Standardization organizations, organizations of and for people with disabilities, industry associations and individual experts in ICT accessibility participated in the development of the User Needs Summary. This User Needs Summary was developed from the original User Needs Summary submitted by the Trace R&D Center of the University of Wisconsin-Madison.

The User Needs Summary is a document that;

— discusses accessibility barriers which people with different disabilities encounter when interacting with ICT systems;

— gathers accessibility needs of ICT users, including those with the widest range of capabilities; and

— can be used to analyze whether or not an ICT accessibility standard fully takes into account the user needs.

The number of people using 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 people with special needs can have access to ICT products and services. The improvement of accessibility of products and services benefits all users, not only people with such special needs, leading to an inclusive e-society.

By providing appropriate ICT accessibility standards, the market of accessible ICT products and services will develop more efficiently and effectively. Standardization encourages organizations to address the needs of the people with disabilities and people with limitations due to age and triggers development of ICT products and services with built in accessibility.

Standardization bodies are starting to address disability and age-related issues and will, increasingly, develop and implement policies and programs in their standards development to include the needs of both people with disabilities and people with limitations due to age. Individuals have different access needs because of their different level of capabilities and disabilities. Particularly people with multiple disabilities have distinct needs. The great variety and distinctiveness of individual differences make it difficult to gather the needs which address the widest range of capabilities and disabilities.

Some standards cover limited domains and in such cases some user needs will not apply. For example, visual accessibility needs are generally not relevant to standards addressing the ability to exert force. Standardization organizations can selectively use the user needs summary for their own purposes.

ISO/IEC JTC1 encourages standardization organizations to utilize the User Needs Summary in a variety of ways, including developing and improving the coverage of accessibility issues in their ICT standards. JTC1 SWG-A would appreciate feedback from standardization organizations on how they have used the User Needs Summary, their findings in general and new work initiated as a result.

Information Technology — Accessibility Considerations for People with Disabilities — Part 1: User Needs Summary

1 Scope

This Technical Report identifies a collection of user needs of people with disabilities for standards developers to take into consideration when developing or revising their standards. These user needs are also useful for developers of information technology products and services and for accessibility advocates to consider.

In addition to identifying user needs, this Technical Report identifies problems that people with disabilities experience with Information Technologies that lead to these user needs and identifies the relationship of these user needs with the accessibility factors for standards developers to consider found in ISO/IEC Guide 71: Guidelines to address the needs of older persons and people with disabilities when developing standards.

2 Terms and Definitions

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

2.1
assistive technology
hardware or software that is added to or incorporated within an ICT system that increases accessibility for an individual

[based on ISO 9241-171, definition 3.4]

2.2
alternative format
different presentation which may make products and services accessible by the use of another movement or sensory ability

[ISO/IEC Guide 71 definition 3.6]

2.3
ICT
information/communication technology
technology for gathering, storing, retrieving, processing, analysing and transmitting information
[ISO 9241-20, definition 3.4]

2.4
interactive system
system
combination of hardware and software components that receive input from, and communicate output to, a human user in order to support his or her performance of a task

[ISO 13407:1999, definition 2.1]

NOTE   The term "system" is often used rather than "interactive system".

2.5
perceive
recognize the existence of something

2.8
understand
recognize the meaning of something

2.9
user
person who interacts with the product, service or environment

[ISO/IEC Guide 71 definition 3.4, adapted from ISO 9241-11:1998]

2.10
user accessibility need
user need
a requirement of a product, service or its environment of use that improves accessibility to the system for users whose abilities are reduced through environmental factors, injury, disability, or natural degradation from aging

NOTE 1   Where there are many other types of user needs, this Technical Report only deals with user accessibility needs and thus uses the shorter form "user need" to refer to user accessibility needs.

NOTE 2   It might not be possible to meet all user needs.

3   Overview of ISO/IEC 29138 Series

ISO/IEC 29138 consists of the following parts:

a)   Part 1: User needs summary

Part 1 identifies a set of user accessibility needs for IT products and services and relates these accessibility needs to the accessibility factors for standards developers to consider found in ISO/IEC Guide 71. These needs provide a basis for other parts of ISO/IEC 29138.

b)   Part 2: Standards inventory

Part 2 identifies major standards developed by various organizations that deal with IT related accessibility in whole or in part.

c)   Part 3: Guidance on user needs mapping

Part 3 provides guidance on mapping user needs to standards and on reporting and/or combining the results of such mappings.

NOTE   The latest version of the User Needs Summary and the User Needs Mapping Template can be obtained from the ISO/IEC JTC1 / SWG-A Website at http://www.jtc1access.org/base.htm

4   User Needs Categories

In order for a product to be accessible

a)   the user needs to be able

1)   to perceive all outputs and capabilities of the product or service (user need categories 1 -5) either directly from the system or via suitable assistive technologies (user need category 15);

2) to understand these perceptions (user need categories 13, 14) either directly with the help of suitable assistive technologies (user need category 15); and

NOTE   In order to make use of the help of suitable assistive technologies, the user will interact via additional actions (as in 3) and perceptions (as in 1) with the assistive technology.

3) to act on this understanding (user need categories 6, 7, 12) either directly on the system or via suitable assistive technologies (user need category 15);

b) the product or service needs to support the user (user need categories 8, 9); and

c) all interactions need to be performed and protected within the overall environment (user needs 10, 11, 16).

Clause 5 provides information about problems users encounter and the user needs that result from these problems.

Within each category of user needs, the discussion of user problems related to those needs lists scenarios that highlight examples of some of the accessibility barriers which people with such disabilities encounter when interacting with ICT systems. These lists are not exhaustive, and are intended to illustrate some of the use cases for the user needs provisions in the related table of user needs

5   User Needs

5.1   Perceive visual information (category 1)

5.1.1   User problems in perceiving visual information

5.1.1.1   People who are blind

— usually cannot access information presented (only) via graphics (user needs: 1-1, 1-2);

— usually cannot find public devices (user needs: 1-1, 1-2);

— usually cannot see (to read) (user needs: 1-1, 1-2);

— usually cannot see what is displayed on visual display units (all types) (user needs: 1-1, 1-2);

— usually cannot determine current function of Soft keys (where key function is dynamic with label shown on dynamic display like LCD) (user needs: 1-1, 1-2);

— some cannot read Braille (late in life, diabetes, no hands, etc) (user need: 1-1).

5.1.1.2   People with low vision

NOTE   Many problems with low vision are the same as with blindness

— might have difficulty discriminating foreground information from background information (user need: 1-11);

— might have difficulty discriminating colours (user needs: 1-4, 1-5);

— might have difficulty with glare – from environment or too bright a screen (user needs: 1-8, 1-9);

— miss information presented temporarily where they are not looking (user need: 1-6);

— sometimes cannot track moving/scrolling text (user needs: 1-6);

— might not see (to read) signs and labels: (user needs: 1-3, 1-5, 1-6, 1-8, 1-9)

    — if text is too small for them,

    — if contrast with background is too low,

    — if text is presented as small raised letters (same colour as background),

    — if information is coded with colour only (colour deficiency),

    — if there is glare if they have light sensitivity ,

    — if there is insufficient ambient light.

5.1.1.3 People who are deafblind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— might not be able to perceive information unless it is presented tactilely (large raised symbols, shapes, or Braille) (user need: 1-2);

— (many) can only access text in Braille or very large (3/4"") raised text (user need: 1-2).

5.1.1.4 People with physical disabilities

— often cannot re-position themselves to see information if not in easy sightline (user need: 1-7);

— might not be able to see due to glare/reflections (and cannot re-position enough) (user need: 1-8);

— might not be able to manoeuvre to see display or avoid glare (user needs: 1-7, 1-8);

— might have difficulty discriminating foreground information from background information (user need: 1-11).

5.1.1.5 People with cognitive, language, & learning disabilities

— might not be able to comprehend the presentation of information in a single modality (user need: 1-12)

5.1.2 User needs in perceiving visual information

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
1-1	visual information also available in auditory form	8.2.2 Alternatives to visual information 8.7.1 Information available as text
1-2	visual information also available in tactile form	8.2.2 Alternatives to visual information
1-3	sufficient brightness for visually presented information (luminance for displays -- illumination for printed)	9.2.1 Seeing
1-4	any information (other than the colour itself) that is presented through colour to be also presented in another way that does not rely on colour.	8.5.3 Colour coding of information

1-5	to change the colours of information	8.5.1 Choice of colour
1-6	text readable with reduced visual acuity Note: Automatically scroll large print text horizontally or vertically on a screen without the need to manually manipulate the source material.	8.6 Size and style of font and symbols in information, warnings and labelling of controls 8.7.3 Printed instructions 9.2.1 Seeing
1-7	information within viewable range of those of short stature or seated in wheelchairs	8.3.1 Location of information and controls and positioning of handles 8.6 Size and style of font and symbols in information, warnings and labelling of controls
1-8	to avoid reflective glare	8.4.4 Avoidance of glare
1-9	to avoid glare from excessive brightness (of material or surrounding)	8.4.4 Avoidance of glare
1-10	to pause, and re-play information presented using audio, video or animation.	8.12.6 Timed responses
1-11	to perceive foreground visual information in the presence of background	8.5.2 Colour combinations
1-12	to see and hear text simultaneously	---

5.2 Perceive auditory information (category 2)

5.2.1 User problems in perceiving auditory information

5.2.1.1 People with any disability

— usually cannot identify the state if the same alternative is provided for different signals (user needs: 2-5).

5.2.1.2 People who are deaf

— usually cannot hear information presented through (user needs: 2-1, 2-2)

— speech,

— tones,

— natural machine sounds.

5.2.1.3 People who are hard of hearing

— might miss any information presented auditorily because

— it is at a frequency they can't hear (user need: 2-4),

— background noise (including echoes, environment, device noise, etc) blocks it or interferes with it (user need: 2-8),

— it is too soft (user need: 2-3),

— the speech is of poor quality (user needs: 2-7, 2-9),

— the speech is too fast – and the user can't slow it down (user need: 2-7),

— might not be able to perceive information presented in stereo (user need: 2-6);

— might have difficulty discriminating sounds (user need: 2-1).

5.2.1.4   People who are deafblind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— (many) can only access information in Braille (user need: 2-2);

— might not be able to perceive information unless it is presented tactilely (large raised symbols, shapes, or Braille) (user need: 2-2).

5.2.2   User needs in perceiving auditory information

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
2-1	auditory information also available in visual form	8.2.3 Alternatives to auditory information 8.7.1 Information available as text
2-2	auditory information also available in tactile form	8.2.3 Alternatives to auditory information
2-3	to adjust the volume to a suitable level	8.20.2 Amplification and adjustment
2-4	auditory events, alerts etc, be multi-frequency	8.9 Loudness and pitch of non-spoken communication
2-5	when vibration is used as a substitute for different auditory events, then some need vibration to have different vibration patterns (rather than vibration frequency or strength)	8.2.3 Alternatives to auditory information
2-6	multi-channel auditory information available in monaural form	8.20.2 Amplification and adjustment
2-7	to pause, and re-play audio information	8.10 Slow pace of information presentation
2-8	to perceive foreground audio information in the presence of background (including ambient noise)	8.20.1 Acoustical Design
2-9	to adjust the audio characteristics (e.g. pitch, balance)	8.20.2 Amplification and adjustment

5.3 Perceive existence and location of actionable components (category 3)

5.3.1 User problems in perceiving existence and location of actionable components

5.3.1.1 People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— usually cannot determine number, size, location or function of controls on (user need: 3-1)

— touchscreens,

— flat membrane keypads;

— might touch "touch sensitive" controls or screen buttons while tactilely exploring (user need: 3-1);

— usually cannot relocate controls in a large featureless group easily even if known to be there (user need: 3-3);

— might not discover a switch or control in an obscure location even if it is visible (user need: 3-5);

— can be misled by phantom (tactile) buttons (things that feel like buttons but are not; e.g. a Logo, a round flat raised bolt head, a styling feature) (user need: 3-2);

— usually cannot type on a non-touch-type-able keyboard (user need: 3-1);

— can have difficulty finding controls, slots, etc using only tactile cues (user needs: 3-3, 3-8).

5.3.1.2 People with low vision

NOTE   Many problems with low vision are the same as with blindness

— usually cannot find buttons that don't contrast with background. (won't feel where nothing is visible or expected) (user need: 3-4);

— can be confused by visual phantom buttons (logos, styling that looks like button when blurred) (user need: 3-2);

— usually cannot locate where the cursor is on the screen (user need: 3-7).

5.3.1.3 People with physical disabilities

— often cannot re-position themselves to see information if not in easy sightline (user need: 3-6);

— might not be able to see due to glare/reflections (and cannot re-position enough) (user need: 3-6).

5.3.1.4 People with cognitive, language, & learning disabilities

— might not recognize stylized control (e.g. a radio box, a check box) as a control (user need: 3-2).

— might not be able to understand controls that look different than expected (user need: 3-9)

5.3.2 User needs in perceiving existence and location of actionable components

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
3-1	to locate and identify all keys and controls via non-visual means without activating them Note: touch sensitive or very light touch controls located where they will not be touched while tactilely finding keys they must use to operate device.	8.11.1 Identification by form 8.12.3.1 Handling 8.12.3.2 Spacing
3-2	to have non-actionable elements (logos, decorative details) not look or feel like buttons or controls	8.11.1 Identification by form
3-3	sufficient landmarks and cues to be able to quickly re-find all keys and controls during use NOTE: Nibs, groupings, spacing are examples of tactile landmarks.	8.11.1 Identification by form
3-4	controls that visually contrast with their surroundings Note: some benefit from ability to adjust colors of on screen controls	8.5.1 Choice of colour 8.5.2 Colour combinations
3-5	controls to be in places where they can be easily found with low vision and with no sight	8.3.1 Location of information and controls and positioning of handles
3-6	controls within viewable range of people of short stature or seated in wheelchairs	8.3.1 Location of information and controls and positioning of handles
3-7	focus and pointing indicators that are visible with low vision	8.6 Size and style of font and symbols in information, warnings and labelling of controls
3-8	information describing the layout of the operational parts	8.12.2 Instruction manuals and location of markings
3-9	location and layout of controls to be consistent	---

5.4 Perceive status of controls and indicators (category 4)

5.4.1 User problems in perceiving status of controls and indicators

5.4.1.1 People with any disability

— might not be able to identify state information if the same indicator is used to communicate different states (user need: 4-4).

5.4.1.2 People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— usually cannot tell status of visual indicators (LEDs, on screen indicators etc.) (user need: 4-1);

— usually cannot tell the status of switches or controls that are not tactilely different in different states (or where tactile difference is too small) (user needs: 4-3, 4-8) .

5.4.1.3 People with low vision

NOTE   Many problems with low vision are the same as with blindness

— usually cannot read visual indicators with low vision if indicator is not bold (user need: 4-5);

— usually cannot distinguish between some colours used to indicate status (user need: 4-6);

— usually cannot see or read small icons for status (user need: 4-5);

— usually cannot see cursors unless large, high contrast. (user need: 4-5).

NOTE   Static cursors are usually harder to see than dynamic cursors

5.4.1.4 People who are deaf

— usually cannot hear audio indicators of status (user need: 4-2);

— usually cannot hear natural sounds (e.g. machine running, stalled, busy, etc) (user need: 4-2).

5.4.1.5 People who are hard of hearing

— might not hear status sounds due to volume level, frequency used, background noise, restrictions on volume level settings allowed in a particular environment, etc (i.e., a library environment) (user need: 4-7).

5.4.1.6 People with physical disabilities

— might not have good line of sight to indicators (user need:4-9)

— might not have tactile sensitivity to detect tactile status indications (user need: 4-3).

5.4.1.7 People with cognitive, language, & learning disabilities

— might not recognize or understand different indicators (user need: 4-9).

5.4.2 User needs in perceiving status of controls and indicators

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
4-1	a non-visual equivalent to any visual indicators or operational cues, designed (power light) or intrinsic (e.g. visual movements)	8.2.2 Alternatives to visual information
4-2	a non-audio indicator for any auditory indicators or operational cues, designed (e.g. beeps, lights) or intrinsic (e.g. machine sounds, visual movements)	8.2.3 Alternatives to auditory information
4-3	a non-tactile alternative to any subtle tactile feedback	8.12.3.3 Status of controls

4-4	alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators)	8.2.3 Alternatives to auditory information
4-5	visual indicators (e.g. LEDs, on screen indicators, mouse cursors) that are visible with low vision	8.6 Size and style of font and symbols in information, warnings and labelling of controls
4-6	controls and indicators that are perceivable without relying on colour	8.5.3 Colour coding of information
4-7	sufficient quality (e.g. volume, direction, clarity, frequency) for audio cues	8.20.2 Amplification and adjustment
4-8	tactile indicators (i.e. for those who need indicator to be both non-visual and non-auditory)	8.12.3.3 Status of controls
4-9	information within viewable range of those of short stature or seated in wheelchairs	8.3.1 Location of information and controls and positioning of handles

5.5 Perceive feedback from an operation (category 5)

5.5.1 User problems in perceiving feedback from an operation

5.5.1.1 People with any disability

— might not be able to identify state information if the same indicator is used to communicate different states (user need: 5-4);

— might not discern different feedback signals if

— difference is too little (user needs: 5-3, 5-5, 5-8, 5-12),

— feedback occurs at different location from action (user needs: 5-10, 5-11).

5.5.1.2 People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— usually cannot see visual feedback of operation (user needs: 5-1, 5-2).

5.5.1.3 People with low vision

NOTE   Many problems with low vision are the same as with blindness

— usually cannot see visual feedback of operation unless large, bold (user needs: 5-5, 5-6, 5-12);

— often have impaired hearing as well and cannot rely on audio cues (user need: 5-2).

5.5.1.4 People who are deaf

— usually cannot hear auditory feedback of operation (user needs: 5-2, 5-3).

5.5.1.5 People who are hard of hearing

— often cannot hear auditory feedback of operation due to (user needs: 5-8, 5-9)

— volume,

— frequency used,

— background noise,

— speech feedback not clear or repeatable.

5.5.1.6 People with physical disabilities

— might not be able to feel tactile feedback due to insensitivity or impact of hand or use of artificial hand, stick, splint etc to operate the control (user need: 5-4).

5.5.1.7 People with cognitive, language, & learning disabilities

— might not be able to perceive feedback unless it is predictable (user need: 5-12)

NOTE Predictability covers areas such as location of information elements, sequencing of events, how feedback/ errors/confirmation are presented, location of controls, etc.

5.5.2 User needs in perceiving feedback from an operation

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
5-1	feedback to be audio or tactile (i.e. non-visual)	8.2.2 Alternatives to visual information 8.11.3 Tactile warnings
5-2	feedback to be tactile (i.e. both non-visual and non-auditory)	8.2.2 Alternatives to visual information 8.2.3 Alternatives to auditory information 8.11.3 Tactile warnings
5-3	a visual or auditory alternative to any subtle tactile feedback	8.12.3.3 Status
5-4	alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators)	8.2.3 Alternatives to auditory information
5-5	visual feedback that is obvious with low vision	8.17.2 Feedback 8.6 Size and style of font and symbols in information, warnings and labelling of controls
5-6	feedback that is perceivable without relying on colour	8.5.3 Colour coding of information
5-7	to adjust the colours to make things easier to read	8.5.1 Choice of colour

N/A

		8.5.2 Colour combinations
5-8	sufficient quality (e.g. volume, direction, clarity, frequency) for audio feedback	8.20.2 Amplification and adjustment
5-9	audio feedback that does not require tone differentiation	---
5-10	visual or tactile feedback to occur at the same location as the control	---
5-11	clear feedback of connector engagement (e.g. power cord, PC card, USB connector, etc.)	---
5-12	feedback to be predictable	---

5.6 Be able to invoke and carry out all actions including maintenance and setup (category 6)

5.6.1 User problems in invoking and carrying out all actions

5.6.1.1 People with any disability

⸺ might not be able to use controls that do not have tactile or pictorial information (user need: 6-1).

5.6.1.2 People who are blind

⸺ usually cannot use controls that require hand-eye coordination (user needs: 6-1, 4);

⸺ usually cannot use devices with touch-activated controls (user needs: 6-1, 6-2, 6-4);

⸺ usually cannot use products or services that require presence of iris or eyes (user need: 6-20).

5.6.1.3 People who are blind and/or who have high level paralysis

⸺ might not be able to operate products except using speech (user need: 6-19).

5.6.1.4 People with low vision

NOTE   Many problems with low vision are the same as with blindness

⸺ can have difficulties using a device that requires hand-eye coordination (user needs: 6-1, 6-4).

5.6.1.5 People who are deafblind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⸺ might not be able to use either hearing or sight to compensate for the other sense (user need: 6-1).

5.6.1.6 People who are deaf

⸺ might not be able to operate devices via voice activation (only) (user need: 6-5).

5.6.1.7   People who are hard of hearing

⸻ might not be able to operate devices via voice activation (only) (user need: 6-5).

5.6.1.8   People with speech disabilities

⸻ usually cannot operate devices via voice activation (only) (user need: 6-5).

5.6.1.9   People with physical disabilities

⸻ might not be able to operate devices if operation requires (i.e. no other way to do function)

    ⸻ too much force (user need: 6-7),

    ⸻ too much reach (user need: 6-10),

    ⸻ too much stamina (including long operation of controls with arm extended or holding handset to head for long period unless able to prop or rest arm) (user needs: 6-8, 6-9),

    ⸻ the use of both upper limbs at the same time (user needs: 6-6, 6-18),

    ⸻ contact with body (so that artificial hands, mouthsticks etc cannot be used) (user needs: 6-14, 6-18),

    ⸻ simultaneous operation of two parts (modifier keys, two latches, etc) (user needs: 6-6, 6-18),

    ⸻ tight grasping (user needs: 6-11, 6-18),

    ⸻ pinching (user needs: 6-12, 6-18),

    ⸻ twisting of the wrist (user needs: 6-13, 6-18),

    ⸻ quick repetition of the initial movement (user need: 6-16),

    ⸻ fine motor control or manipulations (e.g. can't operate with closed fist). (user needs: 6-15, 6-16, 6-18);

⸻ might not be able to use products or services that require presence of fingerprints or other specific body parts or organs (e.g. for identification) (user need: 6-20);

⸻ might not be able to operate products designed for a specific hand (user need: 6-17);

⸻ might not be able to move to physically operate the product at all (user need: 6-19);

⸻ might be too slow if they have to keep repositioning themselves to reach frequently used controls (user need: 6-4);

⸻ might not be able to repeat the right action if repetition procedure is physically exhausting (user needs: 6-8, 6-9);

⸻ might have difficulties activating commands if they have difficulties accessing information about keyboard shortcuts (user need: 6-23)

5.6.1.10   People with cognitive, language, & learning disabilities

⸻ might not be able to input text (user need: 6-21);

⸻ might become disoriented or confused if patterns of similar actions are not consistent (user need: 6-22).

13

N/A

5.6.2 User needs in invoking and carrying out all actions

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
6-1	to operate all functionality using only tactilely discernable controls coupled with non-visual feedback Note: In order to operate products efficiently and in available time (see 6-7 and 6-12) some need to be able to access all computer software functionality from the keyboard (or keyboard emulator) without any visual feedback.	8.3.1 Location 8.3.3 Layout 8.2.2 Alternatives to visual information
6-2	to access all functionality without having to use touch or very light touch activated controls	---
6-3	to fully operate the product without requiring a pointing device	8.2.1 Alternative Format general considerations *(requires all input in at least one alternative format)*
6-4	to access all computer software functionality from the keyboard (or keyboard emulator) with only visual feedback	8.2.1 Alternative Format general considerations
6-5	an alternative method to operate any speech controlled functions	8.2.4 Alternatives to voice input
6-6	a method to fully operate the product that does not require simultaneous actions	8.12.3.1 Handling
6-7	a method to fully operate the product that does not require much force	8.12.3.1 Handling
6-8	a method to fully operate the product that does not require much continuous force	8.12.5 Duration of actions
6-9	a method to fully operate the product that does not require much stamina (includes sustained or repeated activity without sufficient rest)	8.12.5 Duration of actions
6-10	a method to fully operate the product that does not require much reach (weakness,, stature or wheelchair)	8.12.3.1 Handling
6-11	a method to fully operate the product that does not require tight grasping	8.12.3.1 Handling
6-12	a method to fully operate the product that does not require pinching	8.12.3.1 Handling
6-13	a method to fully operate the product that does not require twisting of the wrist	8.12.3.1 Handling
6-14	a method to fully operate the product that does not require direct body contact	8.2.5 Biological identification and operation
6-15	a method to fully operate the product that does not require much accuracy of movement Note: Some need the customization of the object area where	8.12.3.1 Handling

	a double click is effective	
6-16	to adjust the speed and acceleration of input devices Note: Some need a setting for adjusting the acceleration of a pointer.	---
6-17	to operate the product with only a left or only a right hand	8.2.5 Biological identification and operation 8.12.3.1 Handling
6-18	to operate the product without use of hands	8.2.5 Biological identification and operation
6-19	to operate the product using only speech	---
6-20	alternatives to biometric means of identification	8.2.5 Biological identification and operation
6-21	alternative modalities to text input	8.2.1 General considerations
6-22	to have similar patterns of activation for similar actions	---
6-23	visual indication of keyboard shortcuts	---

5.7 Be able to complete actions and tasks within the time allowed (category 7)

5.7.1 User problems in completing actions and tasks within the time allowed

5.7.1.1 People with any disability

— might use alternative input mechanisms that are often much slower (user need: 7-2);

— might miss information or messages only displayed for a fixed period (user need: 7-1);

— might not be able to complete actions in the usual amount of time provided (user need: 7-2).

5.7.1.2 People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— use non-visual techniques that are often slower requiring more time than usual to read/listen to output, explore and locate controls etc (user need: 7-2).

5.7.1.3 People with low vision

NOTE   Many problems with low vision are the same as with blindness

— often take longer to read text and locate controls (user need: 7-1);

— might not be able to read text if it moves while they are reading it (user need: 7-1).

5.7.1.4 People who are deaf or hard of hearing

— might be reading information in a second language (sign language being first) (user need: 7-1);

— might be communicating (or operating phone system) through a relay/interpreter which introduces delays (user need: 7-2).

5.7.1.5 People who are hard of hearing

— might have to listen more than once to get audio information (user need: 7-1).

5.7.1.6 People with physical disabilities

— might take longer to read (due to head movement), to position themselves, to reach or to operate controls (user need: 7-1);

— might take longer to read when the information source involves a book, newspaper, a manual, etc., due to their difficulty in turning pages (user need: 7-1);

— might not be able to operate if operation requires quick repetition of the initial movement (user need: 7-2);

— might be affected by time pressure that can sharply decrease mental processing (user need: 7-2).

5.7.1.7 People with cognitive, language, & learning disabilities

— might be distracted by dynamic movements on screen (user need: 7-4);

— might take longer to remember, to look things up, to figure out information and to operate the controls (user need: 7-3);

— might be affected by time pressure that can sharply decrease mental processing (user need: 7-2);

— might not be able to read text if it moves while they are reading it (user need: 7-1);

5.7.2 User needs in completing actions and tasks within the time allowed

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
7-1	much more time to read displayed information	8.12.6 Timed responses
7-2	much more time to complete actions - and no feeling of time pressure	8.12.6 Timed responses
7-3	information necessary to plan their actions in advance	---
7-4	the ability to avoid visual or auditory distractions that prevent focusing on a task	8.20.1 Acoustical design

5.8 Avoiding unintentional activation of controls (category 8)

5.8.1 User problems with unintentional activation of controls

5.8.1.1 People who are blind or with low vision or are deafblind

— might inadvertently activate "touch sensitive" controls or screen buttons while tactilely exploring (user needs: 8-1, 8-3);

— might inadvertently activate low activation force switch(es) while tactilely exploring (user needs: 8-1 8-3);

— might inadvertently activate low contrast switches/controls that they do not see (user need: 8-3).

5.8.1.2 People with physical disabilities

— might activate functions due to extra body movements (tremor, chorea) (user needs: 8-1, 8-2);

— might activate functions when resting arm while reaching (user need: 8-2);

— might activate user interface functions while moving around (e.g. wheelchair other assistive technologies) (user need: 8-1, 8-2).

5.8.2 User needs to avoid unintentional activation of controls

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
8-1	products and controls designed so they can be explored without activation, either tactilely or through keyboard navigation	8.11.1 Identification by form 8.12.3.2 Spacing to avoid interference
8-2	to operate controls with tremor or spasmodic movements without inadvertent entries	8.12.3.2 Spacing to avoid interference
8-3	controls that are not activated by a slight touch or when they receive keyboard focus	---

5.9 Be able to recover from errors (category 9)

5.9.1 User problems in being able to recover from errors

5.9.1.1 People with any disability

— might not realize that an error has occurred (user need: 9-1);

— might not realize what error has occurred (user need: 9-1);

— might not be able to figure out how to go back and undo the error (user need: 9-2);

— might be slow to recover from errors (user needs: 9-3, 9-4).

N/A

5.9.1.2 People who are blind or have low vision

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⸺ might not be able to perceive contextual cues (if visual only) to know they did something wrong or unintended (when not an 'error' to the device) (user need: 9-1).

5.9.1.3 People with cognitive, language, & learning disabilities

⸺ might be confused by an error message (user need: 9-2, 9-3, 9-4)

5.9.1.4 Error-related problems that are covered by the perception needs

5.9.1.4.1 People who are blind or have low vision

⸺ might not detect error if indication is visual (user needs: 1-1, 1-2, 1-3, 1-4, 1-5).

5.9.1.4.2 People who are deaf

⸺ will not hear auditory 'error' sounds (user needs: 2-1, 2-2).

5.9.1.4.3 People who are hard of hearing

⸺ might not hear auditory 'error' sounds or be able to distinguish between them (user needs: 2-1, 2-2, 2-3, 2-4, 2-6, 2-8).

5.9.1.4.4 People who are deafblind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⸺ might not be able to see visual error alerts or hear audio error alerts (user need: 2-2).

5.9.2 User needs in being able to recover from errors

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
9-1	notification when the product detects errors made by the user	8.21 Fail-safe
9-2	unambiguous guidance on what to do in the event of a reported error	8.21 Fail-safe
9-3	a means (e.g. a mechanism) to go back and undo the last thing(s) they did	8.21 Fail-safe
9-4	to reset (to initial condition)	---

5.10 Have equivalent security and privacy (category 10)

5.10.1 User problems in having equivalent security and privacy

5.10.1.1 People with any disability

⸺ might not be able to have privacy when human assistance is required (e.g. interpreters, guides, personal assistants) (user needs: 10-2, 10-3);

5.10.1.2 People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⸺ have more difficulty detecting people looking over shoulder (user needs: 10-2, 10-3);

⸺ will have information broadcast to others via speaker, if no headphone or handset is available (user need: 10-1).

5.10.1.3 People with low vision

NOTE   Many problems with low vision are the same as with blindness

⸺ who use larger print make it easier for others to look over their shoulder (user needs: 10-2, 10-3).

5.10.1.4 People who are deaf

⸺ might not detect sensitive information being said aloud (user need: 10-1).

5.10.1.5 People who are hard of hearing

⸺ might not realize louder volume of audio can allow eavesdropping (even with headphones) (user need: 10-1).

5.10.1.6 People with physical disabilities

⸺ in a wheelchair, might not have their body block view of sensitive information (like someone standing might) (user needs: 10-2, 10-3).

5.10.1.7 People with cognitive, language, & learning disabilities

⸺ are less able to determine when information should be kept private (user needs: 10-2, 10-3).)

5.10.2 User needs in having equivalent security and privacy

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
10-1	private listening capability, when using audio alternatives to visual information in public places	---
10-2	protection of the privacy of their information, even if they are not able to do the "expected" things to protect it themselves	---

10-3	security of their information, even if they are not able to do the "expected" things to protect it themselves	---

5.11 Not cause personal risk (e.g. seizure, etc.) (category 11)

5.11.1 User problems in avoiding personal risk

5.11.1.1 People who are blind

NOTE 1   Many problems with low vision are the same as with blindness

NOTE 2   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— can't see to avoid hazards that are visual (user need: 11-3);

— can't see warning signs, colours, markers, etc (user need: 1, 3);

— are less aware of surroundings (and may not be used to it) if they are using headphones (user needs: 11-1, 11-4).

5.11.1.2 People who are deaf or hard of hearing

— might not detect alert tone and operate device when unsafe (user need: 1, 4);

— might miss sounds that indicate imminent device failure (user needs: 11-1, 11-4).

5.11.1.3 People with physical disabilities

— might hit objects harder than usual and cause injury (user need: 11-2);

— might not sense when they are injuring themselves (user needs: 11-1, 11-2);

— might not have temperature sensitivity (e.g. temperature of notebook computer) (user needs: 11-1, 11-2).

5.11.1.4 People with seizure disorders

— might have seizures triggered by certain stimuli (e.g. visual, auditory) (user need: 11-5, 11-6).

5.11.1.5 People with allergies and other sensitivities

— might have adverse reactions to materials, electro-magnetic emissions, fumes and other adverse aspects of products they touch or are near (user need: 11-4).

5.11.2 User needs in avoiding personal risk

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
11-1	products where hazards are obvious, easy to avoid, and difficult to trigger	8.14.1 Clear labeling of hazards and allergens

		8.14.2 "Allergy tested" labels 8.15.1 Surfaces should not get excessively hot 8.18.2 Sharp points
11-2	products that do not rely on specific senses or fine movement to avoid injury EXAMPLE: Products that don't assume that body parts will never stray into openings or that only gentle body movements will occur around the products.	---
11-3	to use products safely without seeing hazards or warnings	8.2.2 Alternatives to visual information 8.11.3 Tactile warnings
11-4	to use products safely without hearing hazard warnings	8.2.3 Alternatives to auditory information 8.9 Loudness and pitch of non-spoken communication
11-5	to avoid visual patterns that causes them to have seizures	8.2.6 Prevention of seizures
11-6	to avoid auditory patterns that causes them to have seizures	8.2.6 Prevention of seizures
11-7	products that do not give off electromagnetic radiation that they are allergic to	8.19 Non-allergenic/toxic materials
11-8	products that do not give off chemicals that they are allergic to	8.19 Non-allergenic/toxic materials

5.12 Be able to efficiently operate product (category 12)

5.12.1 User problems in being able to efficiently operate a product

5.12.1.1   People with any disability

— have difficulty competing in education, employment and other activities if their alternate access technique is not efficient enough. (user need: 12-1)

— user might not have the same optimal settings as another user. (user needs: 12-4, 12-5, 12-6, 12-8, 12-9)

— might have difficulty setting up the accessibility features they need (user needs: 12-4, 12-7)

5.12.1.2   People who are blind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— often have to wait for unnecessary audio before getting to desired information (user needs: 12-1, 12-3)

N/A

5.12.1.3 People with low vision

NOTE   Many problems with low vision are the same as with blindness

⎯ lose their place if cursor moves in unexpected order through data fields (user need: 12-2)

5.12.1.4 People with physical disabilities

⎯ might not be able to access some documents due to physical characteristics (e.g. binding, size, texture, weight) (user need: 12-10).

5.12.1.5 People with cognitive, language, & learning disabilities

⎯ might have difficulty learning and remembering how to use an ICTuser interface (user need: 12-12)

5.12.2 User needs in being able to efficiently operate a product

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
12-1	alternate modes of operation that are effective given the time constraints of the task	---
12-2	keyboard navigation that follows a meaningful sequence through form controls	---
12-3	to increase the rate of audio alternatives (unless there are minimal audio alternatives)	---
12-4	system level accessibility preference settings that apply across applications	---
12-5	to have applications not override or defeat built-in accessibility features	---
12-6	accessibility preference settings preserved unless explicitly changed Note: Any applications that want to change accessibility features can ask the user first, and return the setting when the application ends.	---
12-7	preference settings to change immediately preferably without requiring system reboot	---
12-8	to save and restore individual preference settings	---
12-9	accessibility functions that can be returned to an initial state individually or together after each user	---
12-10	hardcopy documents to be usable with one hand or mouthstick	8.12.2 Instruction manuals and location of markings
12-11	structure when navigating long audio material	---

12-12	consistent and predictable user interfaces	8.17.1 Operations

5.13 Understand how to use product (including discovery and activation of any access features needed) (category 13)

5.13.1 User problems in understanding how to use product

5.13.1.1 People who are blind or have low vision or are deafblind

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⎯ might have difficulty getting an overall concept of the product since they cannot see the overall visual layout or organization (user need: 13-1);

⎯ might have difficulty navigating complex layouts (user need: 13-1).

   NOTE Complex layouts can confuse someone navigating with arrow keys.

⎯ might not be able to read instructions (user need: 13-7).

5.13.1.2 People who are deaf

⎯ might have difficulty understanding the spoken/written language used on the product (e.g. English, Spanish, French, etc.) because it is different from their natural (first) language (e.g. if it is sign language) (user need: 13-2, 13-3).

5.13.1.3 People with cognitive, language, & learning disabilities

⎯ might not be able to read labels, signs, manuals etc due to reading limitations (user needs: 13-7, 13-14);

⎯ might have difficulty understanding directions – especially if printed (user need: 13-7);

⎯ might have difficulty adapting their memorized procedure if required steps change (user need: 13-10);

⎯ might have difficulty remembering steps for use (user need: 13-9);

⎯ might have difficulty getting it turned on – and therefore active (user need: 13-4);

⎯ might be confused by options, buttons, controls, that they don't need or use (user need: 13-11);

⎯ might be confused by icons and symbols that do not make sense to them or that they do not remember (user needs: 13-2, 13-3, 13-9);

⎯ might have difficulty with products or services that differ from real life experience enough to confuse them (user need: 13-8);

⎯ might have difficulty with products that operate in non-standard ways (user need: 13-3);

⎯ might have difficulty remembering the organization of a product, its menus etc (user needs: 13-5, 13-6, 13-9);

⎯ might have difficulty with any hierarchical structures (user needs: 13-5, 13-6);

— might have difficulty understanding how to turn on special access features they need (user need: 13-4, 13-13);

— might have difficulty understanding (or learning) how to operate a product if the way to use it is different than for other users (user need: 13-13);

— might have difficulty if the product is not in standard mode (user need: 13-4);

— might not understand purpose of control (or control changes due to use of soft key) (user needs: 13-11, 13-12).

5.13.2 User needs in understanding how to use product

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
13-1	to get overview and orient themselves to product and functions/parts without relying on visual presentation or markings on product	8.3.1 Location 8.3.3 Layout
13-2	wording, symbols, and indicators used on products that are as easy to understand as possible given the device and task Note: Information and feedback is to be "salient," and "specific" rather than subtle or abstract in order to understand it.	8.7.2 Complexity of information
13-3	products or services to use standard conventions, words and symbols for their culture (cross-cultural if possible)	8.8 Graphical symbols and illustrations
13-4	clear and easy activation mechanisms for any access features	---
13-5	navigation that supports different thinking styles	---
13-6	to understand product if they have difficulty thinking hierarchically	---
13-7	any text read aloud to them	8.2.2 Alternatives to visual information
13-8	steps for operations that are minimized and clearly described	8.7.2 Complexity of information
13-9	interfaces that limit the memorization required of the user to operate them successfully	---
13-10	cues to assist them in multi-step operations	---
13-11	simple interfaces that only require them to deal with the controls they need (advanced or optional controls removed in some fashion)	---
13-12	each function on its own key rather than having keys change their functions but look/feel the same	---
13-13	to know that a product is usable by them and how to set it up to work for them	---

13-14	information presented in an alternative to text based representation	8.2.1 General considerations

5.14 Understanding the output or displayed material (even after they perceive it accurately) (category 14)

5.14.1 User problems in understanding the output or displayed material

5.14.1.1 People who are blind

NOTE 1   Many problems with low vision are the same as with blindness

NOTE 2   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

⎯ might have difficulty when output often only makes sense visually (user need: 14-2);

EXAMPLE Reading some outputs can be confusing (e.g. "select item from list at the right" doesn't tell the user that they get to it by pressing down arrow).

⎯ might have difficulty with any simultaneous presentation of audio output and audio description of visual information (user need: 14-3, 14-11).

EXAMPLE   Playing audio while the user is reading of screen information can create distractions for some users.

5.14.1.2 People who are deaf

⎯ might be reading information in a second language (sign language being first) (user need: 14-1);

⎯ can have difficulty with simultaneous presentation of visual information and (visual) captions of auditory information. (user need: 14-4).

5.14.1.3 People with cognitive, language, and learning disabilities

⎯ might be unable to read printed text (user needs: 14-1, 14-10);

⎯ might have difficulties with language that is too complex for them (user needs: 14-1, 14-10);

⎯ might have their memory abilities taxed by long or complex messages (user needs: 14-1, 14-10);

⎯ use of idiom or jargon may make it hard to understand (user need: 14-1);

⎯ structures, tabular or hierarchical information may be difficult (user needs: 14-1, 14-2);

⎯ might not be able to understand text output (user needs: 14-12, 14-13);

⎯ might not understand or may misinterpret the use of colours and symbols (user need: 14-14).

5.14.2 User needs in understanding the output or displayed material

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References

14-1	textual material to be worded as clearly and simply as possible	8.7.2 Complexity of information
14-2	text, illustrations and diagrams in spoken form	8.7.1 Information available as text
14-3	to not have device noise or regular audio output interfere with ability to understand accessibility audio	---
14-4	visual information generated by access features (such as captions) not to occur simultaneously with other visual information that they must view EXAMPLE: Captions that are not essential to understanding are not displayed at same time as critical information is presented on the screen.	---
14-5	image resolution and speed be sufficient to understand any sign language presented	---
14-6	to slow audio, video, or animated information down slightly	---
14-7	to replay, pause, change speed in order to understand information	---
14-8	to replay auditory information	---
14-9	enlargeable text wordwrap that stays on screen and is understandable	---
14-10	feedback using pictures or symbols	8.8 Graphical symbols and illustrations
14-11	to silence audio output	---
14-12	information presented in an alternative to text	8.2.1 General considerations
14-13	textual information presented using figures of speech (such as abbreviations, idioms, metaphors, etc.) is also presented in a way that does not require understanding of those figures of speech	8.7.3 Printed instructions
14-14	information to be available regarding the meaning associated with colours and symbols	---

5.15 Ability to use their assistive technology (AT) to control the ICT(category 15)

5.15.1 User problems in using assistive technology (AT)

5.15.1.1   People with any disability

— might not be able to use their AT to access ICT if (user need: 15-1, 15-2)

  — they cannot access all functionality from their AT (or from tactile controls on the ICT) (user need: 15-3).

  — the ICT is for public use and

— they will not have their AT with them and/or

— they do not have permission to use their AT with the ICT (E.g. they cannot install AT software on a library system),

— they do not know that their AT will work with the ICT,

— they are not able to connect their AT to the ICT,

— they are not easily able to find the connection mechanism to the ICT,

— the ICT or another device connected to the ICT interferes with it;

— a suitable AT is not available for new technologies when they come out (user need: 15-4).

5.15.1.2   People who are blind or with low vision

NOTE   People who are deafblind include those with varying degrees of vision and hearing loss, thus the problems relating to people who are blind, have low vision, are deaf, and/or are hard of hearing are also relevant to them.

— usually cannot access information via their AT and visual information is not available to their AT in machine translatable form (user needs: 15-2. 15-3).

5.15.1.3   People who are deaf - (and some who are hard of hearing)

— cannot access information if they must use their AT and auditory information is not available to their AT in machine translatable form via a standard connection mechanism (user needs: 15-2. 15-3).

5.15.1.4   People who are hard of hearing

— need all audio information to be available via a standard connection mechanism that is compatible with their assistive listening devices (ALDs) (user needs: 15-2. 15-3);

— need a standard audio connector to plug their ALD.

NOTE   For something held up to the ear, it is important to be T-Coil compatible.

5.15.1.5   People with physical disabilities

— might not be able to use products that aren't fully operable with artificial hand, stick, stylus etc (user needs: 15-2. 15-3);

— might not be able to use product without a standard connection point that allow operation of all controls (user needs: 15-2. 15-3).

5.15.1.6   People with cognitive, language, & learning disabilities

— might not be able to access information if they must use their AT and the information is not available to their AT in machine translatable form via a standard connection mechanism (user needs: 15-2. 15-3).

5.15.2 User needs in understanding the output or displayed material

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References

15-1	that the product not interfere with AT (e.g. No electrical noise interference with hearing devices.)	---
15-2	to use their AT with the device (e.g. Alternate display, amplifiers, or alternate controls)	---
15-3	full and efficient functional control of a product using their AT, including pass-through of user feedback and notifications such as error messages	---
15-4	an AT available that will work with new technologies, at the time of release of the new technology	---

5.16 Cross Cutting Issues (category 16)

5.16.1 User problems related to cross cutting issues

5.16.1.1   People with any disability

— might not be able to

— continue to work if accessibility functions are not available or are disrupted (user needs: 16-2, 16-10),

— use the "default" state of a product that is optimized for mainstream (user need: 16-2),

— perform daily maintenance (e.g. changing paper – not repairing) if they live or work alone (user need: 16-4),

— set up products with no one available to help (user needs: 16-2, 16-4, 16-5),

— use new technologies when they come out (user need: 16-1),

— make use of available help materials (user needs: 16-5, 16-6);

— use a help line when they call for help because (user need: 16-4)

— they cannot talk and/or hear to access voice-based help lines,

— they hang up or they are hung up on, because the help line mistakes cerebral palsy for drunkenness,

— they cannot talk on the phone with a help line and follow instruction while fixing/using the product at the same time,

— might not

— understand what it means for someone to use alternate input or output device with their product (user need: 16-9),

— have an appropriate interface, or cannot set up one up easily or quickly (user need: 16-2),

— have means to provide feedback and recommendations to developers (user need: 16-8).

5.16.1.2 People with physical disabilities

— might not have enough room around product to get to it or to use it (user needs: 16-3).

5.16.1.3 People with multiple disabilities

— might not be able to use systems designed for people with any one of their disabilities (user needs: 16-7).

5.16.2 User needs related to cross cutting issues

User Need ID	Some users need …	ISO Guide 71 and ISO TR22411 References
16-1	new technologies that are accessible when they are released	---
16-2	to access the controls that allow them to turn on and adjust the built in accessibility features	---
16-3	an accessible path and a means to position oneself within reach of installed products	8.16 Accessible routes
16-4	timely access to trained customer service personnel (e.g. Help Desk)	---
16-5	accessible training and support materials	---
16-6	electronic access to copyrighted and otherwise protected material	---
16-7	the product to be usable by those with multiple disabilities	---
16-8	a means to provide feedback about improvements to accessibility to meet their particular needs	---
16-9	product accessibility information to be disseminated to distributors, retailers, installers, system integrators, customer organizations, and people with disabilities	---
16-10	to have their accessibility functions available at all times, without disruption	---

Annex A
Bibliography to support and explain user needs

The main sources of information to support and explain user needs are:

1. ISO Guide 71 "Guidelines for standards developers to address the needs of older persons and persons with disabilities,"

2. ISO 9241-20 "Ergonomics of human-system interaction – Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services,"

3. ISO 9241-171 "Ergonomics of human-system interaction – Part 171: Guidance on software accessibility,"

4. ISO 13407 "Human-centred design processes for interactive systems," and

5. ISO TR 22411 "Ergonomic data and guidelines for the application of ISO/IEC Guide 71 in standards related to products and services to address the needs of older persons and persons with disabilities."

The following source supports and explains user need 1-8:

1. Sanders, M.S. and McCormick, E.J. (1987) Human Factors in Engineering and Design (6th Edition). McGraw-Hill, New York, pp 389-426.

The following source supports and explains user need 1-8:

1. Sanders, M.S. and McCormick, E.J. (1987) Human Factors in Engineering and Design (6th Edition). McGraw-Hill, New York, pp 79-116.

The following sources support and explain user need 5-7:

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The following sources support and explain user need 11-5:

1. Epilepsy Foundation (2007) Photosensitivity Website Article (http://www.epilepsyfoundation.org/answerplace/medical/seizures/precipitants/photosensitivity/photosensitivity.cfm

2. Binnie, C.D., Emmett, J., Gardiner, P., Harding, G.F.A, Harrison, D. and Wilkins, AlJ. (2002) Characterizing the Flashing Television Images That Precipitate Seizures. Society of Motion Picture and Television Engineers Journal, July, pp. 323-329.

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2. Bartha, L. et al (1999). Multiple Chemical Sensitivity: A 1999 Consensus. Archives of Environmental Health. 54(3) pp 147-149.

The following source supports and explains user need 16-6:

1. Kerscher, G. and Fruchterman, J. (2002) First Monday, 7 (6) URL: http://firstmonday.org/issues/issue7_6/kerscher/index.html

Annex B
(informative)

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