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Ergonomics of human-system interaction - Part 171: Guidance on software accessibility (ISO/DIS 9241-171:2025)

Ergonomie der Mensch-System-Interaktion - Teil 171: Leitlinien für die Barrierefreiheit von Software (ISO/DIS 9241-171:2025)

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Ergonomics of human-system interaction —

Part 171: Guidance on software accessibility

Ergonomie de l'interaction homme-système —

Partie 171: Lignes directrices relatives à l'accessibilité aux logiciels

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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— UAAG 2.0, with notes pointing at UAAG for more information

— The user accessibility needs in ISO/IEC 29138-1

— Common practices in industry

— Guidance condensed and generalized where possible

— References to existing ISO accessibility-related standards added

— Annexes for mapping this standard to other documents added:

  — Annex A for mapping with WCAG 2.2

  — Annex B for mapping with UAAG 2.0,

  — Annex C for mapping with ISO 9241-171:2008

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This document was prepared by Technical Committee [or Project Committee] ISO/TC [or ISO/PC] ###, *[name of committee]*, Subcommittee SC ##, *[name of subcommittee]*.

This second/third/... edition cancels and replaces the first/second/... edition (ISO #####:####), which has been technically revised.

The main changes compared to the previous edition are as follows:

— xxx xxxxxxx xxx xxxx

A list of all parts in the ISO ##### series can be found on the ISO website.

Introduction

Accessibility is an important consideration in the design of products, systems, environments and facilities because it affects the range of people who are able to use them and use them easily. The more accessible a design, the wider the range of people who will find it usable.

The purpose of this document is to provide guidance on the design of the software of interactive systems so that those systems achieve as high a level of accessibility as possible. Designing human-system interactions to increase accessibility promotes increased effectiveness, efficiency and satisfaction for people having a wide variety of capabilities and preferences. Accessibility is therefore strongly related to the concept of usability (see ISO 9241-11).

The most important approaches to increasing the accessibility of a human-system interface are

— meeting accessibility goals and user accessibility needs (see ISO/IEC 29138-1),

— adopting a human-centred approach to design (see ISO 9241-210),

— following a context-based design process,

— providing the capacity for individualization, and

— offering individualized user instruction and training.

It is important to incorporate accessibility goals and features into the design as early as possible, when it is relatively inexpensive compared to the cost of modifying products to make them accessible once they have been designed. As well as providing guidance for achieving that, this part of ISO 9241 addresses the increasing need to consider social and legislative demands for ensuring accessibility by the removal of barriers that prevent people from participating in life activities such as the use of environments, services, products and information.

This document is applicable to software that forms part of interactive systems used in the home, in leisure activities, in public situations and at work. Requirements and/or recommendations are provided for system design, appearance and behaviour, as well as specific accessibility issues, thereby complementing a wide range of International Standards (referenced in this document), as well as reflecting the goals outlined in ISO Guide 71.

Accessibility is an issue that affects many groups of people and many different environments. The intended users of interactive systems are consumers or professionals — people at home, at school, engineers, clerks, salespersons, Web designers, etc. The individuals in such target groups vary significantly as regards physical, sensory and cognitive abilities and each group will include people with different abilities. People with disabilities do not form a specific group that can be separated out and then disregarded. The differences in capabilities can arise from a variety of factors that serve to limit the capability to engage in the activities of daily living and are a “universal human experience”. Therefore, accessibility addresses a widely defined group of users including:

— people with physical, sensory and cognitive impairments present at birth or acquired during life,

— elderly people who can benefit from new products and services but who experience reduced physical, sensory and cognitive capacities,

— people with temporary disabilities, such as a person with a broken arm or someone who has forgotten his/her glasses, and

— people who experience difficulties in particular situations or environments, such as a person who works in a noisy environment or has both hands occupied by other activities.

This document recognizes that some users of software will need assistive technologies in order to use a system. In the concept of designing software to be accessible, this includes the capability of a system to provide connections to, and enable successful integration with, assistive technologies, in order to increase the number of people who will be able to use the interactive system. Guidance is provided on designing

software that integrates as effectively as possible with common assistive technologies. It is important to note that accessibility can be provided by a combination of both software and hardware controlled by software. This does not mean that every product will be usable by every consumer. There will always be a minority of people who will need adaptations or specialized products. This part of ISO 9241 emphasizes the goals of maximizing the number of users and striving to increase the level of accessibility that these users experience.

This document serves the following types of users:

— designers of user interface development tools and style guides to be used by interface designers;

— user interface designers, who will apply the guidance during the development process;

— developers, who will apply the guidance during the design and implementation of system functionality;

— those responsible for implementing solutions to meet end-user needs;

— buyers, who will reference this part of ISO 9241 during product procurement;

— evaluators, who are responsible for ensuring that products are in accordance with this part of ISO 9241.

The ultimate beneficiary of this document will be the end-user of the software. Although it is unlikely that end-users will read this document, its application by designers, developers, buyers and evaluators ought to provide user interfaces that are more accessible. This document concerns the development of software for user interfaces. However, those involved in designing the hardware aspects of user interfaces may also find it useful when considering the interactions between software and hardware aspects.

Ergonomics of human-system interaction —

Part 171:
Guidance on software accessibility

1 Scope

This document provides ergonomics guidance and specifications for the design of accessible software for use at work, in the home, in education and in public places. It covers issues associated with designing accessible software for people with the widest range of physical, sensory and cognitive abilities, including those who are temporarily or situationally disabled, and the elderly. It addresses software considerations for accessibility that complement general design for usability as addressed by ISO 9241-11, parts of the ISO 9241-1xx series, and ISO 9241-210.

This document is applicable to the accessibility of interactive systems. It addresses a wide range of software (e.g. home, mobile, office, Web, learning support and library systems).

It promotes the increased usability of systems for a wider range of users in the widest range of contexts of use. While it does not cover the behaviour of, or requirements for, assistive technologies (including assistive software), it does address the use of assistive technologies as an integrated component of interactive systems.

It is intended for use by those responsible for the specification, design, development, evaluation and procurement of software platforms and software applications.

2 Normative references

There are no normative references.

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 Major accessibility related concepts

3.1.1
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]

3.1.2
user accessibility need
UAN
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.

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

[SOURCE: ISO/IEC 29138-1:2018, 3.10, with "user requirements" replaced by "user accessibility requirements"]

3.1.3
usability
extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

Note 1 to entry: The "specified" users, goals and context of use refer to the particular combination of users, goals and context of use for which usability is being considered.

Note 2 to entry: The word "usability" is also used as a qualifier to refer to the design knowledge, competencies, activities and design attributes that contribute to usability, such as usability expertise, usability professional, usability engineering, usability method, usability evaluation, usability heuristic.

[SOURCE: ISO 9241-11:2018, 3.1.1]

3.1.4
effectiveness
accuracy and completeness with which users achieve specified goals

[SOURCE: ISO 9241-11:2018, 3.1.12]

3.1.5
efficiency
resources expended in relation to results achieved

Note 1 to entry: Typical resources include time, human effort, costs and materials.

[SOURCE: ISO 9241-11:2018 31.1.3]

3.1.6
satisfaction
extent to which the user's physical, cognitive and emotional responses that result from the use of a system, product or service meet the user's needs and expectations

Note 1 to entry: Satisfaction includes the extent to which the user experience that results from actual use meets the user's needs and expectations.

Note 2 to entry: Anticipated use can influence satisfaction with actual use.

[SOURCE: ISO 9241-11:2018, 3.1.143.34]

3.1.7
diverse contexts
differing contexts of use and differing economic, cultural and organizational conditions

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

3.1.8
diverse users
individuals with differing abilities and characteristics or accessibility needs

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