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Information technology — Office equipment — Accessibility guidelines for older persons and persons with disabilities

Technologies de l'information — Lignes directrices pour l'accessibilité aux équipements de bureau par les personnes âgées et les personnes handicapées

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword

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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).

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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 Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 28, *Office equipment*.

This second edition cancels and replaces the first edition (ISO/IEC 10779:2008), which has been technically revised.

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

— harmonized with the US Section 508 of the Rehabilitation Act, and EN 301 549;

— defined the policies to ensure and improve accessibility.

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

This document has been developed as guidelines to assist in the design and evaluation of office equipment for operation by persons with the widest range of capabilities, including persons with disabilities and persons with temporary disabilities.

This document specifies features to provide guidance to designers of office equipment based on ISO/IEC Guide 71 and ISO 9241-20:2008.

This document had been developed originally in 2008 to be consistent with the U.S. Section 508 Standards (2000). In 2017, the standards were revised harmonizing EN 301 549:2014. This document for designing accessible office equipment is revised to be coherent with them.

Information technology — Office equipment — Accessibility guidelines for older persons and persons with disabilities

1 Scope

This document specifies accessibility guidelines to be considered when planning, developing and designing electrophotographic copying machines, page printers and multi-function devices. These guidelines are intended to improve accessibility required when primarily older persons, persons with disabilities and persons with temporary disabilities (hereafter referred to as older persons and persons with disabilities) use office equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC Guide 71, *Guide for addressing accessibility in standards*

ISO/IEC 40500, *Information technology — W3C Web Content Accessibility Guidelines (WCAG) 2.0*

ITU-T E.161, *Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 71 and the following 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 http://www.electropedia.org/

3.1
multi-function device
device providing two or more functions, such as electrophotographic copying, facsimile, printing and scanning functions

3.2
accessibility
usability (3.6) of office equipment by persons with the widest range of capabilities, including persons with disabilities and persons with temporary disabilities

Note 1 to entry: The concept of accessibility addresses the full range of user capabilities and is not limited to *users* (3.5) who are formally recognized as having disability.

3.3
assistive technology
piece of equipment, product system, software or service that is used to increase, maintain or improve functional capabilities of individuals with disabilities

Note 1 to entry: This can be acquired commercially off-the-shelf, modified or customized. The term includes technical aids for persons with disabilities. Assistive devices do not eliminate an *impairment* (3.4) but can lessen the difficulty experienced by an individual in carrying out a task or activity in specific environments.

3.4
impairment
problem in body function or structure such as a significant deviation or loss, which can be temporary – due for example to injury – or permanent, slight or severe and can fluctuate over time, in particular deterioration due to aging

Note 1 to entry: Body function can be a physiological or physiological function of a body system; body structure refers to an anatomical part of the body such as organs, limbs and their components (as defined in the International Classification of Functioning and Disability of WHO (ICF 2001).

3.5
user
person who interacts with a system, product or service

[SOURCE: ISO 9241-11:2018, 3.1.8, modified — Note 1 to entry deleted.]

3.6
usability

extent to which a system, product or service can be used by specified *users* (3.5) to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

[SOURCE: ISO 9241-11:2018 3.1.1, modified — Notes 1 and 2 to entry deleted.]

3.7
alternative method
methods used as alternatives to specific functions and operations

EXAMPLE Voice-based functions used as an alternative to displaying.

3.8
private listening
auditory output such as voice guidance designed to be heard only by the *user* (3.5) who is operating the corresponding product can hear the sound

EXAMPLE Personal headsets, directional speakers.

3.9
non-private listening
auditory output designed to be heard by the *user* (3.5) who is operating the corresponding product can hear the sound, and other person around the product

3.10
closed functionality
characteristic that limits a function for disabled *users* (3.5) and prevents them from attaching or installing *assistive technology* (3.3)

4 Basic policies

The basic policies which shall be followed with respect to office equipment in order to ensure and improve accessibility are as follows.

a) The office equipment shall be planned and developed to be usable by older persons and persons with disabilities, by meeting the requirements in Clause 6.

b) The methods that shall meet the requirements in Clause 6 may be the function of the office equipment itself or the software operated with connected personal computers. When the requirements are met by application software on mobile devices, the requirements provided in ISO/IEC 40500 shall be met.

c) The methods that shall meet the requirements in Clause 6 can be the standard form of office equipment, or with its option.

d) An alternative method shall be accepted, if there is no other direct method meeting the requirements in Clause 6.

e) The essential functions and performance of office equipment shall not be interfered by the attempt to meet the requirements in Clause 6.

f) Accessibility shall be ensured and improved, within the safety of user. Extra consideration shall be needed to ensure the safety of users with disabilities, for they sometimes have to operate office equipment following different steps from people without disability, because of their impairments.

g) The operations that are targeted in 6.7 are as follows. For others (from 6.1 to 6.6, and from 6.8 to 6.12), all operations are targeted.

1) Required target operations

— power up /power down / power save / authenticate;

— place a document on platen glass / auto document feeder, and take out;

— select and perform a function (copy, fax, scan, and print);

— take out printed paper;

— perform user registration and management;

— perform actions for security management;

— change the settings (such as defaults) of functions (copy, fax, scan, and print).

2) Recommended target operations

When the safety of older persons and persons with disabilities can be ensured, the following operations should be targeted.

— install hardware;

— supply paper;

— remove a paper jam;

— replace a consumable.

h) The functions targeted in Clause 6 shall be equivalent to the functions provided to people without disabilities.

i) When the status of the conformity with Clause 6 is provided, it shall be shown including the status of consideration each disability shown in Clause 5.

5 Classification of disabilities

5.1 Classification and characteristics of disabilities

5.1.1 General rules

Disabilities targeted in the guidelines are shown from 5.1.2 to 5.1.11.

For specific requirements which office equipment is to consider can be referred in Clause 6. Each disability also shall include the state of disabilities due to temporary injuries and illness.

For older persons, they shall be considered to have a mild symptom that is not included in the following targeted "disabilities", or multiple mild symptoms, and giving consideration to each disability leads to considerations for older persons.

The classification of disabilities is classified by referring to the classification of ISO/IEC Guide 71 and harmonized with the classification of US Section 508 Standards and EN 301 549, premising the use of office equipment.

5.1.2 Blindness

A disability that represents the state of being unable to use vision. A prior learning is premised because operations and actions rely on tactile sense and hearing sense. Blind people cannot make use a mouse but can use a personal computer with a keyboard and screen reading out software. Some users use devices such as smartphones.

5.1.3 Low vision

A disability that represents the state of being able to use vision, but it is limited. The eyesight cannot be corrected to the degree to bear daily life even with eyeglasses. If vision can be corrected, it is not called low vision even if eyesight is low. Some users utilize the accessibility feature of an operating system to use a personal computer and carry a loupe with a high magnification rate. They also use assistive devices like magnifying printed papers including books. Some users move their eyes closer to about 3 cm from the device to operate it.

5.1.4 Colour blindness

A disability that is different from normal colour sensitiveness. Colour blindness includes total colour blindness, which is being completely unable to distinguish any colour, and colour weakness which is difficulty distinguishing some colours. For example, it is well known that people with colour weakness have difficulty distinguishing red and green, but there are some other combinations of colours which are not easily distinguished. They can distinguish better by adjusting to higher contrast, but that may change the colour tone of the user interface, which makes to persons with low vision, who rely on colours to see, more difficult to recognize the operational parts. Meanwhile, due to aging, it becomes difficult for people to distinguish white and yellow, and black and dark blue.

5.1.5 Deafness

A disability that represents the state of being completely unable to use hearing. Since deaf people are unable to hear the words they themselves say, speech impairment can be induced. In daily life, as they cannot hear the surrounding sound, it is sometimes difficult to avoid danger promptly. They may not recognize whether a loud sound is going on or off. So, they may not even realize a vacuum cleaner is not plugged.

5.1.6 Hearing impairment

A disability that represents the state of being partly able to use hearing by using a hearing aid or cochlear implant. However, in many cases, they do not hear as clearly as people without a hearing

disability, and consonants are especially unclear. They recognize the words by predicting through the earlier conversation, or the situation. So, if the subject of conversation suddenly changes, the persons with hearing impairment may not keep up with conversation. The ability to hear lowers due to aging, and it becomes difficult for old persons to recognize especially the higher tones.

5.1.7 Speech impairment

A disability that represents the state of being unable to speak or being able to speak partially. There are various cases, including speech impairment induced from congenital hearing impediment, or removing larynx at cancer surgery. When a person is completely unable to speak, writing messages is the main mean to communicate.

5.1.8 Impairment that limits upper limb strength and action

A disability where it is difficult to perform operations which need strength of hands and fingers, fine motor control or both hands, because of low muscle force, low control capability, prosthetic hand and finger, inability to use one hand, difficulty in simultaneous movement or involuntary movement (tremor).

The difficulties are not limited to the operations that need strength, but also the operation of touch panels or mouse, which need only low strength but require fine finger movements.

Some people may have no thermal nociception due to loss of sensation. Aging lowers muscle strength and control capability.

5.1.9 Impairment that limits reach ranges

A disability that limits accessible ranges, which includes persons who use a cane or a wheelchair, and impairment of upper limb and persons with low height. A wheelchair user without upper limb problem normally uses a manual wheelchair, and wheelchair user who has upper limb problem uses an electric wheelchair. In both cases, as the users have to stretch a hand out from the sitting position, the accessible ranges of the high area, the low area, and the forward area are limited. A user reaching the deep forward area may have a risk of falling. Persons who use a cane may have difficulty to crouch, and the reach range to the low area is limited. For persons with short height, reaching the high area and the area with depth is limited.

5.1.10 Photosensitive seizure

A seizure as such can be caused by continuous flickering of light. It occurs when the brain is strongly stimulated and excited by the flickering of a light or moving images. There was a famous incident in Japan that many children watching a TV animation program became sick from photosensitive seizure.

5.1.11 Cognitive, language, or learning disorders

Disabilities of recognition, memory, abstraction or description. These disabilities include intellectual disabilities, mental disorders, or developmental disorders, which often are innate disabilities, and also other acquired disabilities include higher brain dysfunction, or regression of brain function due to aging. For these disabilities, functions to compensate user's memory, intelligibility and execution of operation are helpful.

Developmental disorders include dyslexia, where a person has difficulties in reading and writing, but no problem with intelligence. A person with aphasia, a type of higher brain dysfunction, sometimes has difficulty putting thoughts into words, this disorder is often confused with speech impairment. The guidelines target the cases of persons with cognitive, language, or learning disorders using office equipment in vocational training or workplace.