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Universal design informs cognitive accessibility standards

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This article describes the background behind the International Standards Organization's (ISO) working group on cognitive accessibility, how it operates, and its work to date.

Background

While assistive products are designed to enable people with disability to function and participate in important life domains, universal design is for everyone. Mainstream products in personal (e.g., smartphone) and public domains (e.g., transport ticket machine) can be designed or configured to meet the needs of most people and are usually less expensive and stigmatising than assistive products. In a world where people use smartphones to organise and negotiate their working, social and recreational lives, people with cognitive impairment can be marginalised or excluded because user interfaces on phones or touch screen devices are confusing or not adapting to individual users' needs and preferences.

With consumer advocacy, industrial and clinical innovations, standards and legislation, we have improved the design of the built environment and products for consumers with physical or sensory impairments. Now the aim is to do the same for people with cognitive impairment and the broader neurodiversity across society. Rather than writing discrete standards for diagnostic groups such as acquired brain injury, dementia, dyslexia, autism, or depression, the ISO cognitive accessibility working group has

adopted the **Universal Design for Learning (UDL) Guidelines** to promote better design for all people.

Work to date

The working group has published two standards since forming in 2015:

1. ISO 21802:2019 Assistive products – Guidelines on cognitive accessibility – Daily time management

This document provides guidelines for the design of products to support daily time management. It addresses the features and functions known to increase the accessibility of products and systems for time management. It gives examples of user needs in relation to daily time management functions followed by design recommendations.

2. ISO 21801-1:2020 Cognitive accessibility – Part 1: General guidelines

This document presents guidelines for the design and development of cognitively accessible systems, including products and services and built environments. It is structured around three concepts adopted from the UDL guidelines: (1) motivation and focus; (2) representation and understanding; (3) action. It emphasises the importance of engaging people with cognitive impairments in the development of mainstream and assistive products.

A third standard is under development:

3. ISO/CD 21801-2 Cognitive accessibility – Part 2: Reporting the cognitive accessibility of products and technologies

This document establishes requirements for reporting the cognitive accessibility of products and systems, giving examples of the applicability of recommendations given in ISO 21801-1. Designers wanting to report on the cognitive accessibility of a specific product can use this guidance along with any relevant existing standards and accompanying test methods

How does the working group operate?

The working group is coordinated by a Chair and Secretary and nominated members of the working group who lead the drafting of specific documents. Members of the working group are from participating ISO countries, such as Sweden, Japan, Denmark, USA, Spain, Australia, and Canada. The group includes people with disability, academic and industry researchers, product designers and developers. Meetings are held several times a year depending on the stage of the projects and deadlines set by ISO.

Prior to COVID-19, meetings were mostly online with occasional hybrid (combining virtual and in-person) workshops hosted in different countries and held over two or three days. With all meetings since March 2020 held online, the time of day is varied, and the agenda includes breaks. These measures acknowledge the different time zones, circadian rhythms and processing styles of members and seek to increase both productivity and conviviality through participation.

The content and drafting process for the General Guidelines ([ISO 21801-1:2020](#)) was led by members of a Swedish organisation called [Begripsam](#). Members of Begripsam include people with disability and people with diverse cognition who are committed to research, development and evaluation of products and services that meet the needs of all people. Their skills and experience in

hosting online and hybrid workshops was necessary to ensure effective teamwork. For example, a key recommendation arising from Begripsam's early work was for data collection and analysis to be conducted over several sessions. The Swedish term "study circles" describes a process where researchers meet weekly from 3-10 times, and work together on whatever the group decides, with a leader who facilitates discussion. There are valid reasons why members may need more time and several opportunities to contribute to the working group, so the Begripsam team often meets in small groups between ISO workshops to reflect on, create or edit ideas and solutions.

Working in accordance with the ISO directives has constrained the generation and expression of more inclusive working practices at times, but also led to constructive debates and consensus. For example, a sophisticated grasp of English is required to follow the rules for the use of verbal forms so that a clear distinction can be made between requirements, recommendations, permissions, possibilities and capabilities.

While ISO documents usually specify how values are to be measured and stated, this has proved challenging because cognitive accessibility is a relatively new area of standardisation with efforts focused on building consensus on the central concepts and characteristics. The **ISO directives** promote the principle of consistency to help the user understand documents or series of associated documents. The leadership of Begripsam has demonstrated that people with diverse cognition can and should be included in standards development and review.

Future work

Several proposals for future projects are being considered by the working group, based on known issues for people with cognitive impairment such as medication management, indoor navigation, and emergency response systems. Many of the domains of interest represent challenges with navigating in time and space. The working group will also revise the general guidelines on cognitive accessibility, with the intention of learning from their application and improving with each iteration.

The working group is keen to integrate the experiences and findings from consumers and research teams into the revision of the general guidelines on cognitive accessibility and the development of new ISO standards. Topics already discussed for standards development include assistive products for personal medication management, systems to support indoor navigation, and systems to support money management. Cognitive accessibility standards will continue to be based on principles of universal design to promote participation of all people in all aspects of society.

If you are interested in finding out more about this work, or contributing to the development of the Standards, please contact the [*Technical Committee Secretariat*](#).

References

- 1. CAST (2018). *Universal Design for Learning Guidelines version 2.2*. Retrieved from <http://udlguidelines.cast.org>**
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- 5. International Organization for Standardization (2021). *ISO/IEC Directives, Part 2 - Principles and rules for the structure and drafting of ISO and IEC documents (Ninth Edition)*. ISO: Geneva.**