FINAL DRAFT International Standard

ISO/FDIS 25556

Ageing societies — General requirements and guidelines for ageing-inclusive digital economy

ISO/TC **314**

Secretariat: **BSI**

Voting begins on:
2025-02-17

Voting terminates on:
2025-04-14

Reference number
ISO/FDIS 25556:2025(en)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 314, *Ageing societies*.

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

0.1 General

The fourth industrial revolution, characterized by rapid digital innovation and exponential growth, has transformed all sectors of society, including how we live, work, and relate to one another. Digital technology can assist in learning new skills, facilitate social interactions, foster independent and autonomous ways of living, and improve the management and delivery of public health and social care services. However, this does not mean that everyone and everything is connected or digitised. Nor does it mean that the social and economic consequences of digital technology are necessarily inclusive or beneficial. Digital technology can both create opportunities and increase inequalities. In fact, not everyone can benefit equally from digital technology. The COVID-19 pandemic has highlighted unequal access to digital technology across and within ageing societies.

Products and services are increasingly provided online. In ageing societies, some people are more likely to be digitally excluded and to experience barriers to accessing products and services online. The reasons vary, for example, people lack access to technology, or they do not fully benefit from the opportunities provided by technology. Digital inclusion can create opportunities for active and healthy ageing, including social and economic participation. Improving digital access and digital literacy can empower people. It is also essential to ensure aging-inclusive design and to ensure the relevance of digital services and products. Additionally, it is important to create ethical, safe digital environments free from ageism that embrace the diversity of older individuals.

Digital economy refers to economic and social activity reliant on, or significantly enhanced by, the use of digital inputs.[42] Establishing ageing-inclusive digital economies (and related standardization) is not only significant but urgent. This document seeks to respond to the context and demands of rapidly evolving digital economies, by providing general requirements and guidelines for ageing-inclusive digital economies from the perspective of the needs of ageing societies, and by addressing common problems of an ageing-inclusive digital economy.

0.2 Opportunities of digitalisation in ageing societies

Digital technology can provide new opportunities and solutions for people living in ageing societies, such as:

— maintaining social connectedness, including connectedness to family members living apart;

— accessing digital communities for the latest updates and information;

— working online by using the internet and mobile devices;

— seeking employment using digital tools;

— participating in online learning;

— accessing digital services, e.g. online shopping, and smart transportation systems;

— accessing medical and health care online, as well as electronic personal health records, e.g. online diagnosis and treatment;

— using digital safety tools and measures, e.g. using smart devices to make an emergency call.

0.3 How can digital technologies support ageing societies?

Digital technology can support ageing societies in multiple ways, for example with regard to the following aspects.

— Visual capabilities – It can be increasingly challenging for older persons and other people to read texts written in small fonts. Therefore, text that can easily be enlarged or compatible with the use of screen magnifiers and screen readers, or both, can be essential.

— Hearing capabilities – Accessible content includes options for communicating with people with hearing difficulties, such as the availability of chats or messaging as an alternative to voice services. Accessible content is also compatible with hearing aid devices, for example, accessible smart TVs.

— Motor ability – To accommodate people with decreased motor skills, accessible information and communication technology (ICT) can be designed to interact seamlessly without requiring precise motor control. It can also support assistive technologies for optimal usability. For example, large clickable areas that include labels, especially for smaller controls, such as radio buttons and checkboxes are important accessibility features for people with limited dexterity.

— Cognitive capabilities – Some people can find it increasingly difficult to find specific information or recognize and access hyperlinks. It is important to consider these issues of usable and accessible designs. Making content easy to read and adding helpful features such as reminders can facilitate access.

— Communicating with the people responsible for websites or mobile apps is sometimes challenging. Accessible and easy customer support channels are important in order to help all customers.

— Social connection and isolation – Social connection can be increased through various ICT-related activities such as digital training and education, online peer-to-peer learning, and by providing support for sharing information.

— Vitality – People can experience a loss of vitality. E-health, telehealth and health apps can encourage healthy behaviour, monitor health and wellbeing.

Everybody ages differently, and people become more diverse as they age, for example in their independence, need for assistance, level of activity.

NOTE See Reference [46] for more information on ageing-inclusive digital economy.

Ageing societies — General requirements and guidelines for ageing-inclusive digital economy

1 Scope

This document provides general requirements and guidelines for an ageing-inclusive digital economy, aiming to enhance its applicability and credibility. It specifies the principles, aspects, scenarios, and actions for establishing or transforming to an ageing-inclusive digital economy.

This document is applicable to consumers, policymakers, administrations, organizations, and other stakeholders in the digital economy.

The requirements and guidelines in this document focus specifically on older people.

This document does not cover information technology, ergonomics, and related requirements and guidelines which are defined or covered by other standards.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology 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
ageing
natural progression of an individual's characteristics over time

Note 1 to entry: The impact of ageing will vary at different ages.

Note 2 to entry: The concept of ageing is very broad and comprehensive, and may include chronological ageing, biological ageing, psychological (psychosocial) ageing, cognitive ageing, functional ageing, social ageing, organizational age, and career age. See ISO 25550 for more information.

[SOURCE: ISO/IEC TR 22116:2021, 3.2, modified — Note 2 to entry was added.]

3.2
ageing society
demographics of an older population that shifts overtime

[SOURCE: ISO 25550:2022, 3.1]

3.3
diversity
characteristics of differences and similarities between people

Note 1 to entry: Diversity includes factors that influence the identities and perspectives that people bring when interacting in digital economy.

[SOURCE: ISO 25550:2022, 3.10, modified — In Note 1 to entry, “at work” was changed to “in digital economy”; Note 2 to entry was deleted.]

3.4
inclusion
inclusiveness
process of including all stakeholders

Note 1 to entry: This involves stakeholders from different groups being accepted, welcomed, and enabled to have a voice and to develop a sense of belonging.

[SOURCE: ISO 25550:2022, 3.11, modified — “inclusiveness” was added as admitted term; “in organizational contexts” was deleted from the definition; original Notes 1 and 2 to entry were deleted.]

3.5
ageing-inclusive
including all stakeholders in *ageing* (3.1) contexts where people of diverse ages are treated fairly and equally and included in all aspects of those contexts

[SOURCE: ISO 25550:2022, 3.15, modified — the term was changed from “age-inclusive” to “ageing-inclusive”; “organization contexts” was changed to “ageing contexts”; “all aspects of the organization” was changed to “all aspects of those contexts”.]

3.6
digital economy
economic and social activities reliant on, or significantly enhanced by, the use of digital inputs

Note 1 to entry: Digital economy includes digital technologies, *digital infrastructure* (3.8), digital services and data.

Note 2 to entry: Digital economy refers to all producers and consumers, including governments, utilizing these digital inputs in their economic activities.

Note 3 to entry: Adapted from Reference [42].

3.7
ageing-inclusive digital economy
digital economy (3.6) which is fair and equal to all stakeholders including people across all age groups in *ageing* (3.1) contexts

3.8
digital infrastructure
infrastructure driven by data and technology, based on the communication network, and centred on data computing facilities

3.9
user
customer
individual who utilizes infrastructures, products, services, environments, and any other components of an *ageing-inclusive digital economy* (3.7)

3.10
policymaker
government department, legislature, or other *organization* (3.12) that is responsible for making rules, laws, regulations, etc. for *ageing-inclusive digital economy* (3.7) and related issues

3.11
administration
government, agent, or other *organization* (3.12) who is authorized to supervise *ageing-inclusive digital economy* (3.7) and related issues

3.12
organization
public or private entity or partnership with the responsibility for the operation of *ageing-inclusive digital economy* (3.7) or part of it

EXAMPLE Relevant *digital infrastructure* (3.8) owner, intelligent product manufacturer, digital service provider, digital platform operator, digital environment operator, and employer adopting digital work approach.

3.13
social media
online technologies and practices that people use to share opinions, insights, experiences and perspectives with each other, transforming traditional one-to-many interactions into many-to-many interactions

[SOURCE: ISO 690:2021, 3.43]

3.14
ageism
stereotyping, prejudice, and discrimination against people on the basis of their age

Note 1 to entry: Ageism takes many forms, including prejudicial attitudes, discriminatory practices, or institutional policies and practices that perpetuate stereotypical beliefs.

[SOURCE: ISO 25550:2022, 3.17]

3.15
accessibility
extent to which products, systems, services, environments and facilities can be used by *users* (3.9) with the widest range of user needs, characteristics and capabilities to achieve identified goals in identified contexts of use

[SOURCE: ISO 25550:2022, 3.2, modified — “people from a population” was changed to “users”.]

3.16
usability
extent to which an infrastructure, system, product or service can be used by specified *users* (3.9) to achieve specified goals with effectiveness, efficiency, convenience, safety, and satisfaction in a specified context of use

[SOURCE: ISO 19869:2019, 3.2.8, modified — “infrastructure” and “convenience, safety” were added to the definition.]

3.17
availability
degree to which a facility or service is available to *users* (3.9) when needed

[SOURCE: ISO/IEC TS 25011:2017, 3.2.4.3, modified — “an IT service” was changed to “a facility or service”.]

3.18
affordability
ability to be economically bearable for the target *users* (3.9)

[SOURCE: ISO 24513:2019, 3.3.19, modified — “target” was added before “users”; Note 1 to entry was deleted.]

3.19
security
combination of *availability* (3.17), confidentiality, integrity, and accountability

[SOURCE: ISO 17090-1:2021, 3.2.24]

3.20
privacy
right of an entity (normally an individual or an organization), acting on its own behalf, to determine the degree to which the confidentiality of their private information is maintained

[SOURCE: ISO/IEC 24775-2:2021, 3.1.46]

3.21
assistive technology
equipment, product system, hardware, software or service that is used to increase, maintain or improve capabilities and safety of individuals

Note 1 to entry: Assistive technology can include assistive services and professional services needed for assessment, recommendation, and provision.

[SOURCE: ISO 25552:2022, 3.28]

4 General

This document addresses the needs of older persons, with the goal of easing their participation in the digital economy. However, the requirements and guidelines in this document are also useful for including as many consumers as possible and emphasizing the principle of design for all.

Annex A provides information and recommendations on different scenarios of the ageing-inclusive digital economies, such as online shopping, banking products or services (BPoS), digital hospitals, digital entertainment, social media, transportation, smart communities, smart homes, working from home and in the workplace, and online learning.

Annex B provides information and recommendations on the actions needed to create an ageing-inclusive digital economy.

5 Principles for an ageing-inclusive digital economy

5.1 Combatting ageism

5.1.1 General

Ageism refers to stereotypes, prejudice, and discrimination against people on the basis of their age.

Ageism is often replicated in the digital economy, just as other implicit and explicit biases of society, and this can partly cause a digital divide between younger and older persons. The prevailing stereotype that older persons cannot master technologies is already internalized by some older persons themselves (an example of self-directed ageism), who sometimes don't even try to adopt new technologies, even when they are both available (see 5.4) and affordable (see 5.5).

Challenging ageism is critical to ensure well-being and the respect of human rights. Governments, organizations, and individuals can eliminate ageism in the digital economy.

5.1.2 Requirements

The organization shall:

a) address ageism to ensure that digital economy is designed, developed, tested, implemented and evaluated equitably and responsibly;

b) take measures to:

   1) mitigate the risk of ageism;

   2) enhance digital economy inclusion and benefits for older persons.

EXAMPLE 1 Involving older persons directly in the design, development, implementation and evaluation of digital economy.

EXAMPLE 2 Enhancing the inter-generational communication in the design, development, implementation and evaluation of digital economy.

NOTE See Reference [47] for more information.

5.1.3 Recommendations

The organization should:

a) design, develop, test, implement, and evaluate the ageing-inclusive digital economy by, with, and for older persons;

b) train the multiple-generation workforce, irrespective of age, in both recognizing and avoiding ageism when approaching their tasks, and in their perception or recognition of ageing;

NOTE See Reference [47] for more information.

c) overcome and decrease forms of ageism and stereotype by capturing and respecting the heterogeneity of older persons and offering them more activities, products, and opportunities for self-fulfilment rather than only for health care and chronic disease management, e.g. entertainment, leisure, learning, productivity (work or other income-generating opportunities), sharing their knowledge and skills with younger generations, service to the community;

d) offer equal opportunities to older persons for participating in digital economy activities, to avoid the ageist cycles of injustice both in inputs and outputs, including, but not limited to:

1) offer options such as “retired” in forms which require disclosing occupational information;

2) offer free options of avatars, portraits, and virtual images with some symbols of some older persons, e.g. silver hair;

3) conduct online recruitment by using algorithms without age bias.

5.2 Accessibility

5.2.1 General

The goal of accessibility for an ageing-inclusive digital economy is to guarantee that people with progressive functional decline, disabilities and impairments related to age can perceive, understand, navigate and interact with intelligent products, digital services, digital platforms and digital environments by assistive technology.

5.2.2 Requirements

The organization shall:

a) present information that uses plain and non-discriminatory language;

NOTE 1 See ISO 24495-1 for more information about plain language.

b) design and present the structure and hierarchy of websites, apps, electronic documents and other digital assets, e.g. navigation features and user interfaces, to conform with standards such as the Web Content Accessibility Guidelines (WCAG),[38] ensuring accessibility for users with progressive functional decline, disabilities and impairments related to age;

c) ensure the intelligent product, digital service, digital platform and digital environment are compatible with user tools, including assistive technologies used by target users.

5.2.3 Recommendations

The organization should:

a) present information that is:

   1) accessible via multiple channels, e.g. tablets, smartphones, computers;

   2) accessible to all user types regardless of sensory abilities or restrictions, i.e. users can perceive it through any of their senses;

   3) supportive of multiple language users;

b) provide users with easy-to-understand captions and descriptions for audio and video content respectively;

c) offer users an easy-to-use element that increases text size without loss of content or functionality;

d) provide ample time for users to read and understand content;

e) pause, stop, or hide the content that automatically moves, blinks, or scrolls;

f) not use colour as the only way to convey information;

g) provide legible labels when content requires input from users;

h) avoid either the interference or conflict, or both, with assistive technology and devices;

   EXAMPLE 1 A pacemaker can be influenced by a strong magnetic field or current.

   EXAMPLE 2 Hearing aids can increase environmental noise and generate new electromagnetic noise when working in a digital environment.

i) use well-formed elements with matching start and end tags, which are nested correctly, in accordance with the specific guidelines or specifications that apply to them.

5.3 Usability

5.3.1 General

Usability refers to several aspects of people engagement with and interaction within digital economy that includes ageing populations. Usability encompasses the quality of the experience, the efficiency of task completion and the satisfaction derived from accomplishing those tasks.

Many functions can decline as people age, e.g. eyesight, hearing, speech, memory, balance, manual dexterity and skin sensitivity. Also, some older persons can need much more time to encode, retrieve and process information, and to make decisions.

Usability and accessibility (see 5.2) are two slightly different perspectives within an ageing-inclusive digital economy. Accessibility aims to ensure that people can complete tasks using technology, while usability strives to deliver high-quality, effective and satisfying experiences for all users. Ideally, these two concepts can converge to create solutions that provide equal access for all to digital products and services.

5.3.2 Requirements

The organization shall take the changing needs of ageing into account in the usability by design. In addition to accessibility, this includes, but is not limited to:

a) keeping the interface, layout, and navigation stable;

b) reducing the update frequency of apps, websites, software and other digital resources;

c) limiting the displayed information to necessary content;