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TECHNICAL REPORT

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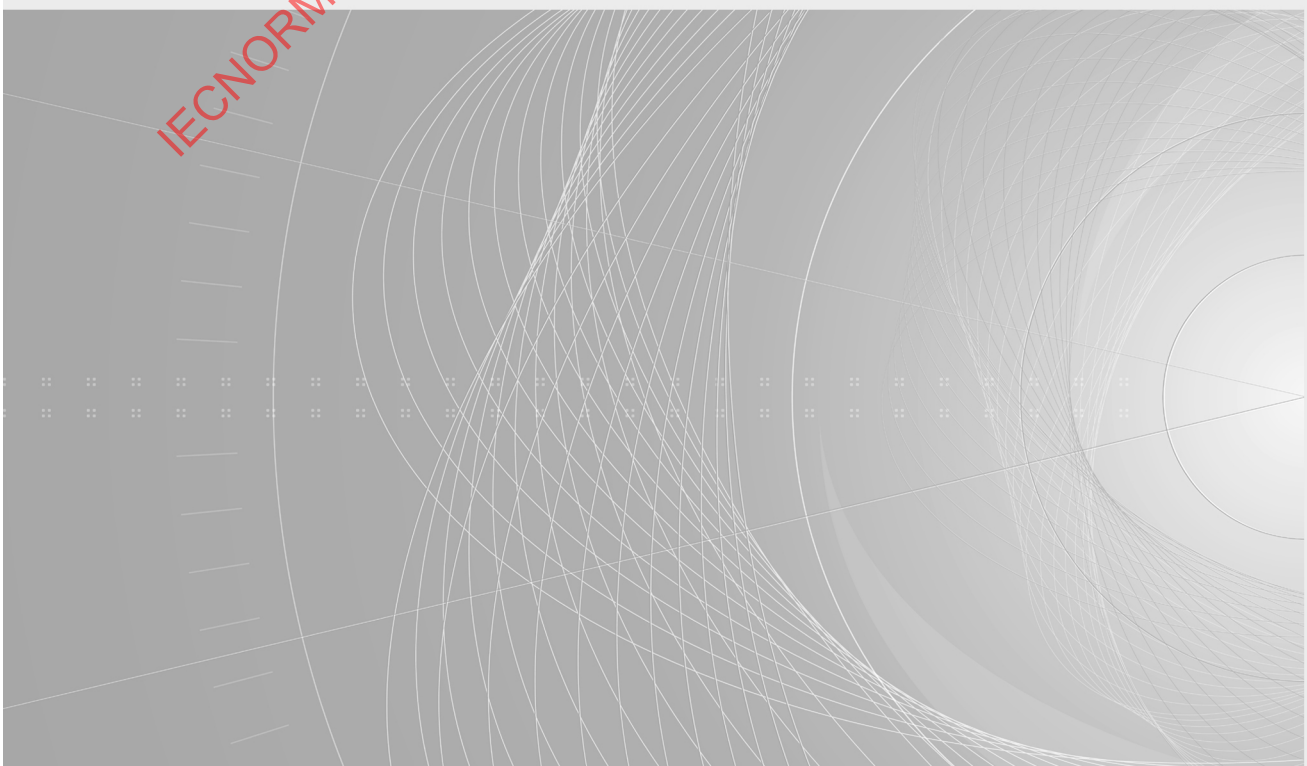
Audio, video and multimedia systems and equipment activities and considerations related to accessibility and usability



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUDIO, VIDEO AND MULTIMEDIA SYSTEMS AND EQUIPMENT ACTIVITIES AND CONSIDERATIONS RELATED TO ACCESSIBILITY AND USABILITY

FOREWORD

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IEC 62678, which is a technical report, has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
100/1688/DTR	100/1737/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

With an objective to research, review, and consider accessibility and usability and to start the project, a survey was designed and distributed to the IEC TC100 P-members to obtain information about the related issues, public policies, and activities. In April 2008, the survey results were reported to the AGS (Bangkok, Thailand) and in November, 2008 the first in-person meeting of the Project Team was held in Sao Paulo, Brazil.

Subsequently, four global teleconferences, numerous electronic mail exchanges, and use of the IEC on-line Collaboration Tools located at www.iec.ch occurred. The Project Team also held an in-person meeting in Tel Aviv, Israel in October 2009. As a result of these sessions, the Project Team produced this TR which attempts to explain the possible relevance of accessibility and usability to the IEC TC100 programme of work. Every aspect of this TR may or may not be appropriate for all IEC TC100 projects and / or participants. Likewise, this TR may or may not address considerations for product designers. However, this TR does provide information to assist the IEC TC100 standards experts in their accessibility and usability research, review, and consideration.

Clause 2 (Normative references) includes those documents referenced in the main body of this TR with the exception of Table 2. This document is numbered with other documents of the Project Team, 002-012, dated 03/31/10.

This TR extracts and applies the user needs published in the ISO/IEC TR 29138-1, Information Technology-Accessibility considerations for people with disabilities – Part 1: User needs summary, paraphrased and extracted with permission.

This TR contains four informative annexes:

a) Annex A on the United Nations (UN) Convention on the Rights of Persons with Disabilities (paraphrased and extracted with permission),

b) Annex B which comments on some IEC TC100 standards which contain accessibility considerations,

c) Annex C on research projects in Europe.

Every effort was made to include resources that are publicly accessible.

AUDIO, VIDEO AND MULTIMEDIA SYSTEMS AND EQUIPMENT ACTIVITIES AND CONSIDERATIONS RELATED TO ACCESSIBILITY AND USABILITY

1 Scope

This Technical Report (TR) provides information on accessibility and usability terms, activities, completed and ongoing standards, technical reports, projects, and specifies user needs that may or may not apply to audio, video and multimedia systems and equipment. Comments about demographics and public policies are included. A checklist of accessibility and usability considerations is also included. Industry experts may or may not apply this information when they evaluate opportunities to integrate support for accessibility and usability in their work.

2 Normative references

The following referenced documents are indispensable for the application 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 25062:2006, *Software product quality requirements and evaluation (SQuaRE) – Common Industry Format (CIF) for usability test reports*

ISO/IEC TR 29138-1:2009, *Information technology – Accessibility considerations for people with disabilities – Part 1: User needs summary*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
accessibility
degree to which a product (e.g., device, service, and environment) is accessible by as many people as possible

NOTE Accessibility can be viewed as the "ability to access" the functionality, and possible benefit, of some system or entity. Accessibility is often used to focus on people with disabilities and their right of access to entities, often through use of assistive technology. Several definitions of accessibility refer directly to access-based individual rights laws and regulations. Products or services designed to meet these regulations are often termed “Easy Access” or “Accessible”. See: www.wikipedia.org

3.1.2
adaptive design
interoperability with assistive technology

NOTE See ISO/IEC Guide 71.

3.1.3
assistive technology
designates assistive, adaptive, and rehabilitative devices designed to enable use by people with disabilities or to enhance usability

3.1.4
barrier-free design
design without barriers for individuals with disabilities

3.1.5
design-for-all
DFA
design and development of products and / or services with the aim that, regardless of age, gender, capabilities, or cultural background, everyone can easily use and access a product and / or service

3.1.6
disability
any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being

NOTE See World Health Organization (WHO), www.who.int/en/

3.1.7
eAccessibility
access to mainstream information and communication technology (ICT) and audio video (AV) products and services by the widest number of people in accordance with design-for-all (DFA)

NOTE See European Association for the Co-ordination of Consumer Representation in Standardisation (ANEC) also described as the "European consumer voice in standardisation" and the European Disability Forum (EDF).

3.1.8
universal design
design for usability by the widest range of users based on their sensory, physical, and cognitive abilities

3.1.9
usability
extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use

NOTE See ISO 9241-11.

3.1.10
user accessibility need
user need
requirements of a product 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 See ISO/IEC TR 29138-2: 2009.

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

ADA	Americans with Disabilities Act
ANEC	European Association for the Co-ordination of Consumer Representation in Standardisation
ASTC	Advanced Television Systems Committee
AT	Assistive Technology
CFR	Code of Federal Regulations

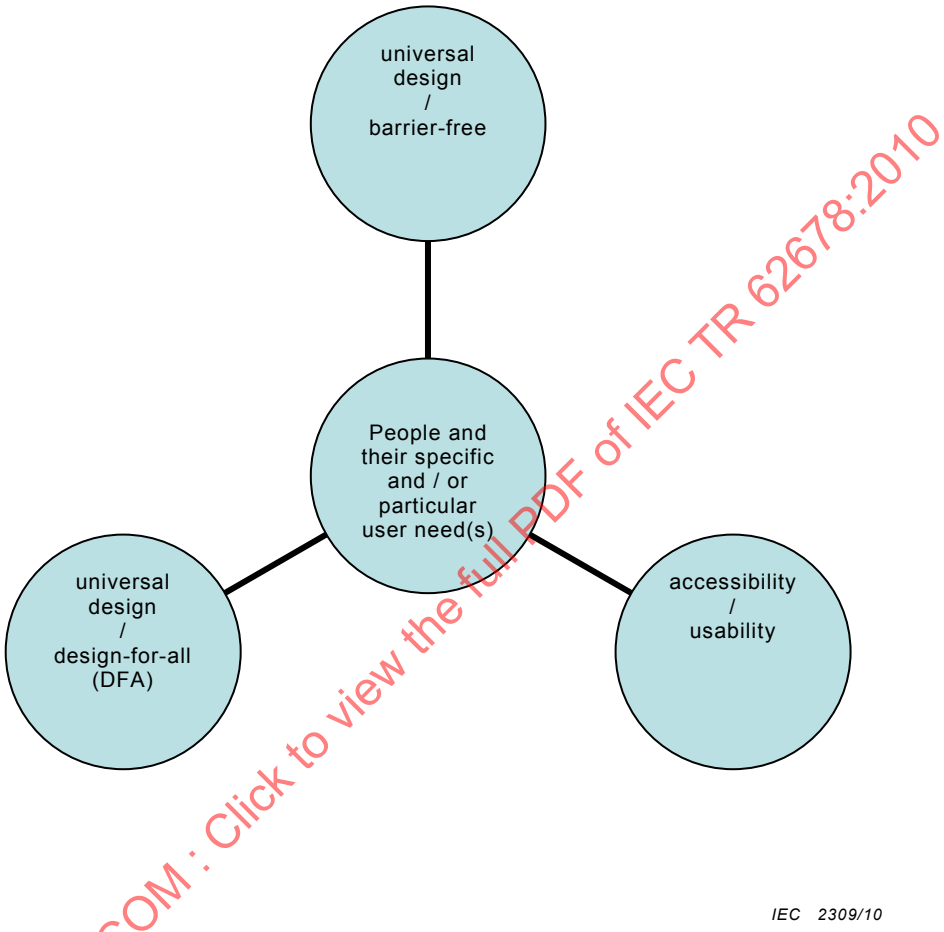
CIF	Common Industry Format
dB	decibel
DDA	Disability Discrimination Act
DFA	Design-For-All
EC	European Commission
EU	European Union
FY	Fiscal Year
ICT	Information and Communication Technology
ISO	International Standards Organization
ITU	International Telecommunication Union
ITU-T	ITU Telecommunication Sector
JIS	Japanese Industrial Standard
JISC	Japanese Industrial Standards Committee
JCA-AHF	Joint Coordination Activity on Accessibility and Human Factors
MEAC	Measuring Progress of E-Accessibility in Europe
METI	Ministry of Economy, Trade and Industry
MIC	Ministry of Internal Affairs and Communications
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
NWIP	New Work Item Proposal
SQuaRE	Software product quality requirements and evaluation
SWG-A	Special Working Group on Accessibilty (of the ISO/IEC Joint Technical Committee One, JTC1)
TA	Technical Area
TR	Technical Report
TRS	Telecommunications Relay Service
VDT	Visual Display Terminal
UK	United Kingdom
UN	United Nations
U.S.	United States of America
USC	United States Code
U.S.FCC	U.S. Federal Communications Commission
W3C	World Wide Web Consortium
WHO	World Health Organization
WG	Working Group

4 Applications of terms and definitions

4.1 Applications and intentions

Although the application of terms and definitions related to accessibility and usability may differ, often the meaning is the same: i.e. to reach as many people as possible. See Figure 1 which depicts the importance of the human aspect in accessibility / usability of terms and definitions.

Among the participants of a survey, designed and distributed to obtain information about accessibility and usability issues, public policies and activities, Japan, China, the U.S., Germany, France and the UK described their use of terms and definitions. They stated that individuals attempting to apply terms and definitions are also encouraged to research national policies. IEC/TC 100 addresses many areas of audio, video and multimedia equipment standardization. As the experts choose to consider the terminology for accessibility and usability, they may use the "Checklist of accessibility and usability considerations" in Clause 11 of this TR.



NOTE People and their specific and/or particular user need(s) are, figuratively, placed in the center of terminology that expresses the intention to meet specific or particular user needs.

Figure 1 – People and their particular user needs

4.2 Applications of the terms: universal design, barrier-free design, accessibility, and disability in Japan

The terms "universal design" and "barrier-free" are used in Japan to describe technology, buildings, and other physical infrastructures. Japanese Industrial Standard (JIS) X 8341 applies terms that may assist audio, video and multimedia systems and equipment standards designers who address individuals with disabilities or individuals who are experiencing natural degradation typically due to aging. JIS X 8341 provides information on ways to improve accessibility, required when (primarily) elderly persons, persons with disabilities and those with temporary disabilities use office equipment. The standard gives information concerning the usability aspects when planning, developing and designing office equipment. In this case, office equipment refers to copying machines, multifunction devices, and page printers that are used in office environments.

In Japan, the term “accessibility" is used to communicate a few concepts with regard to information. Specifically, “accessibility” in Japan is used to communicate the concepts of accessible, usable, and useful information. Generally, the term is used to communicate where “the user can use equipment and services smoothly”. The previous text includes an informal translation of the definition for the term “accessibility”.

NOTE 1 See Barrier-Free, Universal Design Promotion Outline of Japan’s Cabinet Office.

NOTE 2 See Japan’s Info-Communication Access Council.

The term “accessibility” is defined in Japan for the information technology sector by the Ministry of Internal Affairs and Communications (MIC) to address all people including, elderly and disabled persons so they can use information technology products, services and facilities without difficulty.

NOTE 3 Source for documents published in the Japanese: http://www.soumu.go.jp/s-news/2005/051215_1.html

For the terms “accessibility” and “usability” used with respect to equipment and services the JIS Z 8071 standard may be followed. The scope of JIS Z 8071 begins as follows: “This guide provides guidance to writers of relevant standards on how to take into account the needs of older persons and persons with disabilities. Whilst recognizing that some people with very extensive and complex disabilities may have requirements beyond the level addressed in this Guide, a very large number of people have minor impairments which can be easily addressed by relatively small changes of approach in standards, thereby increasing the market for the product or service”.

The scope of JIS Z 8071 continues, as follows “this Guide aims to inform, increase understanding and raise awareness about how human abilities impact on the usability of products, services and environments”. As stated in the scope, JIS Z 8071 aims to outline the relationship between the requirements in standards and the accessibility and usability of products and services and to raise awareness about the benefits of adopting accessible design principles in terms of wider markets. The scope explains that the Guide applies to products, services and environments encountered in all aspects of daily life and intended for the consumer market and the workplace.

According to the Japanese “Physical Disability Welfare Act (informal translation)”, enacted in 1951, which was partially amended to define disability for people of 18 years of age and older, the term “disability” consists of various types of disabilities including sight, hearing, and motor skills. Glaucoma, total blindness, and amblyopic conditions are also included. Notably, colour-blindness, conditions of cataract, and the degradation of sight due to aging are not included. Therefore, an all-encompassing definition of “disability” is not intended. The concept of a hearing disability in Japan, addresses a specific hearing disability of 70 decibel (dB) and above, but does not include degradation due to aging which results in hearing loss of sounds at higher frequencies.

The participants in the IEC/TC 100 from the Japanese National Committee comment that as the AV products decrease in their size and the functions of such products change, improved usability and added convenience results for those individuals experiencing natural degradation due to aging or due to disabilities. Reportedly, some Japanese industries share a common concept surrounding the improvement of usability. That is, the concept of "universal design" which has applications in various industrial areas and is useful for communication purposes. According to the Japanese Ministry of Economy, Trade and Industry (METI), regardless of one’s culture, language, nationality, age, gender, or disability, “universal design” expresses how one can use products, facilities, and information. The “universal design” concept, in Japan, remains general and widely used for industrial products and product features.

NOTE 4 See http://www.meti.go.jp/report/data/g00828bj.html.

NOTE 5 See http://www.meti.go.jp/report/downloadfiles/g10522cj.pdf.

In Japan, “barrier free design” applies to public transportation infrastructure and buildings. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) promotes “barrier free” to communicate the concept that, regardless of disability, age, sex, and race, easy operation including life-style and environment are provided.

NOTE 6 See http://www.mlit.go.jp/sogoseisaku/barrierfree/index.html

NOTE 7 See http://www.mlit.go.jp/sogoseisaku/barrier/mokuji_.html

NOTE 8 See http://www.mlit.go.jp/kisha/kisha05/01/010711_.html

Japan’s “Law for accessible transportation and facilities” (known as the ‘New Barrier-Free Law’) communicates barrier-free design. Japan’s MLIT promulgates this law as the position of the “General Principles of Universal Design Policy.”

NOTE 9 See http://www.mlit.go.jp/kisha/kisha05/01/010711/04.pdf

Although the physical infrastructure, including buildings, remains out of the scope of this TR, mentioning this aspect assists in describing the overall trend of helping people. Other data include the FY 2005 reports that the awareness of universal design was 64,3 % in Japan and the awareness of barrier-free was 93,8 %.

NOTE 10 See “The Japanese People’s Awareness Survey for Promoting Barrier-free Society (informal translation of the survey name),” December 2005 the Cabinet Office.

4.3 Application of the term: barrier-free design in China

In China, “barrier-free design” applies to public transportation infrastructure and buildings. The term is promoted for the transportation and facility sector by the Ministry of Housing and Urban-Rural development and the Ministry of Railways.

The barrier-free design concept in China applies regardless of disability, age, sex and race. “Barrier- free design” is a concept which provides easy operation. This includes aspects of life-style and environment.

4.4 User needs and accessibility in the U.S.

In the U.S., the “user needs” of individuals with disabilities are discussed within the context of information and communication technology (ICT) and the requirements to assist individuals with disabilities. Generally, “good usability” occurs when the user experiences improved usability.

Accessibility in the U.S., as codified in Federal regulations, addresses the features and functions that support the use of a device by as many people as possible. The Americans with Disabilities Act (ADA) provides for an individual who is considered to have a "disability" if that person has a physical or mental impairment that substantially limits one or more major life activities, has a record of such impairment, or is regarded as having such impairment. The Electronic Technology Accessibility Standards (Section 508) and the Closed Captioning of Video Programming, 47 Code of Federal Regulations (C.F.R.), Section 79.1, and the Section 255, Manufacturers of Equipment, of the Telecommunications Act of 1996 set forth accessibility provisions. New, draft Information and Communication Technology (ICT) Standards and Guidelines, released for public comment in March 2010, are under consideration for Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d).

NOTE 1 See www.access-board.gov

NOTE 2 See www.fcc.gov

4.5 Universal design and design-for-all in Germany

In Germany, the terms “universal design” and “design-for-all (DFA)” are used synonymously and interchangeably. These terms are used to convey a goal of reaching the widest possible range of users based on their sensory, physical and cognitive abilities.

In Germany, persons with disabilities are sometimes described as a heterogeneous group which, in some cases, need special services or products. Therefore, according to the European Association for the Co-ordination of Consumer Representation in Standardisation (ANEC), also known as “The European consumer voice in standardisation,” the importance of supporting the interoperability between assistive and mainstream technologies remains.

For the purpose of this Technical Report, Germany’s observations include the point that improvements in audio video usability will not only benefit individuals with disabilities, but will also assist the growing number of people who are aging. Germany’s eInclusion activities, following the policies of the EU Commission and the ratification of the UN Convention of the Rights of Persons with Disabilities, add to a high awareness of this nation’s accessibility. In Germany, usability remains a competitive advantage and the implementation remains voluntary, whereas accessibility is typically mandated by Law.

According to the European Commission, in the Commission’s “eAccessibility” communiqué, DFA consists of three main strategies:

a) design for most users without modifications;

b) design for easy adaption to different users (e.g., using adjustable interfaces), and

c) design with a view to connect seamlessly to assistive technology devices.

4.6 French application of the terms usability and accessibility

The French practices for large home appliances, sometimes known as “white goods,” address “usability,” and no issues are anticipated with using the terms “usability” and “accessibility” interchangeably due to the similarity of their definitions. Usability, however, is an important element of differentiation for a product choice. The BP X35-074, a guide for good practices, gives guidance for designers regarding usability. The guide is for white goods. According to the French National Committee of the IEC/TC 100, the use of terms may or may not present realistic goals for standards experts if applied to many products that are used by a broad range of people. The specific concern is that such terms and goals may lead to an unrealistic design expense related to attempting to address the needs of most users. Therefore, the French National Committee recommends that a focus on specific user needs remain important. The French National Committee also recommends that the IEC/TC 100 role in usability standards is to give a list of desirable improvements and inadvisable design, and also to give methods of measurement of the level of usability for product designers.

Notably, the French law defines “disability” as everyone with difficulties in everyday activities due to temporary or permanent symptoms or reduced quality or strength of health. French regulations impose accessibility for individuals in wheelchairs for public buildings. The usability of Internet sites is still under study.

4.7 Use of terms and definitions for disability and disabled person in the UK

The UK’s Disability Discrimination Act (DDA) of 1995 defines “disability” and “disabled person” as “a person with a physical or mental impairment which has a substantial and long-term adverse effect on his (or her) ability to carry out normal day-to-day activities. .Further, the UK’s DDA of 1995 uses the terms disability and/or disabled person as they can relate to user needs addressed by universal design, barrier-free, and DFA. The terms are used quite broadly and with significant influence.

4.8 Interchangeability of terms

Applying the various terms, previously mentioned, interchangeably is recommended until such an approach raises ambiguity. Any ambiguity could be resolved, however, through the use of graphics, drawings, images, and by textually describing those processes that take place in audio, video and multimedia equipment and systems that yield accessibility / usability environments. Notably, any graphics, drawings, images or text, however, should not take the form of labeling, since labeling systems remain outside the scope of the IEC/TC 100.

Should one intend to address accessibility and usability, a person with physical or mental impairments should be involved in the discussions. Specifically, the impairments should have a substantial and long-term adverse effect on the individual's ability to carry out normal day-to-day activities, as defined in UK DDA, and other laws and policies.

Similarly, from a broader perspective, individuals representing the needs of specific communities should also be involved. Furthermore, information about how the influence of the use of certain terms and their potential impact on audio, video and multimedia equipment functions, features, and standardization potential to reach the broadest possible audience should be analyzed. The terminology used in the IEC/TC 100 standards activities may purposefully align with those terms that are used in already existing various accessibility and usability standards, practices, and guidelines.

5 Organizations and topic areas

5.1 Priorities

Many key priorities for accessibility and usability state:

a) information should be perceivable and understandable;

b) user interfaces should be operable by all, and

c) content should be robust enough to be reliably interpreted in a variety of systems which may also include the use of assistive technology.

In some countries, meeting identified accessibility requirements, along with the above priorities allows audio video and multimedia systems and equipment to be used by individuals with disabilities and those individuals who experience natural degradation due to aging.

5.2 Resources for standards development

Table 1 describes some of the organizations and their accessibility and usability topic areas that provide resources for audio, video, multimedia systems and equipment standards development. Notably, for software, product quality requirements and evaluation, a common format, and usability testing becomes a priority in some cases. ISO/IEC 25062, Software product quality requirements and evaluation (SQuaRE) – Common Industry Format (CIF) for usability test reports is an example of a standard for this purpose. Table 2 includes other examples.

Table 1 – Organizations and topic areas

Organization	Topic areas
Advanced Television Systems Committee (ATSC) www.atsc.org	Standards development for the digital transport stream including closed captioning features and functions, such as various character sets, multiple fonts within a window, language options, as well as many closed captioning window commands.
Consumer Electronics Association (CEA) www.ce.org	Industry standards development for interoperability between new products and existing devices. Standards making body accredited by the American National Standards Institute (ANSI).
European Telecommunications Standards Institute (ETSI) http://portal.etsi.org	Electrical products with reference to persons with special needs.
European Committee for Electrotechnical Standardization (CENELEC) http://cenelec.eu/Cenelec/About+Cenelec/default.htm	Voluntary electrotechnical standards that help develop the Single European Market/European Economic Area for electrical and electronic goods and services removing barriers to trade, creating new markets, and cutting compliance costs.
ISO/IEC JTC1 Special Working Group on Accessibility (SWG-A) http://isotc.iso.org/livelink	Accessibility considerations for persons with disabilities. This Special Working Group developed technical reports on accessibility, including the technical report on user needs which IEC (ISO/IEC 29138-1) paraphrases.
ISO/IEC JTC1 SC28 http://isotc.iso.org/livelink	Standardization of basic characteristics, test methods and other related items, excluding such interfaces, communication interfaces and protocols, of office equipment and products such as printers, copying equipments, digital scanners, facsimile equipment and systems composed of combinations of office equipment.
ISO/IEC JTC1/SC35 http://isotc.iso/org/livelink Working Groups follow: WG1 Keyboards and input interfaces WG2 Graphical user interface and interaction WG4 User interfaces for mobile devices WG5 Cultural and linguistic adaptability WG6 User Interface Accessibility WG7 User interfaces object, actions and attributes WG8 User interfaces for remote interactions	User-system interfaces between users (including people with special needs) and systems encompassing input and output devices in information technology environments, with a priority of meeting the JTC1 requirements for cultural and linguistic adaptability.
ISO/Technical Committee (TC)159 Ergonomics http://isotc.iso/org/livelink Working Groups follow: SC 4/WG 5 Software ergonomics and human-computer dialogues SC 4/WG 6 Human-centred design processes for interactive systems	Guidelines for auditory signals on consumer products, sound pressure levels of signals in noisy conditions, signs, displays, luminance, and its use in assessment of light.

Organization	Topic areas
ITU-T Study Group 2 – Operational aspects of service provision and telecommunications management http://www.itu.int/ITUT/studygroups/com02/area.html	Question 4/2 (continuation of Q.3/2): human factors and telecommunications to address needs of all members of society, including older people and persons with disabilities, to maximize the accessibility and usability of telecommunication/ICT services and products. Service acceptance, accessibility, and usability through “universal design” (design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design). “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed. (excerpt from Article 2 of the Convention on the Rights of Persons with Disabilities). Access for persons with disabilities to new information and communications technologies and systems, including the Internet (Article 9). Design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost (Article 9). Human interface, service access and control procedures, feedback, and tone signal user acceptance. Voice-assisted user/service dialogue. Entry of alphabetic information with numeric keypad. Language issues for voice response. Symbols and pictograms to assist telecommunication users, including facilities and services that accommodate people with disabilities, older people, and children. Reduced complexity of mobile phones.
ITU-R Study Group 6 – Broadcasting Service	Radio communication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public. Working Party 6A has developed a preliminary draft, new Recommendation: “Digital Radio Broadcast Service, Captioned Radio.”

Organization	Topic areas
ITU-T Study Group 16 – Multimedia coding, systems, and applications http://www.itu.int/ITU-T/studygroups/com16/sg16-q26.html	Performance, perception, and control of communications for maximum usability in accordance with the principles of inclusive design. Video standards for sign language and lip reading at very low bit rates in error prone environments. Communication equipment interfaces to allow user interface equipment to be attached by people with varying capabilities and preferences. Support for talking menus, keyboards, pointing devices, listening and viewing devices, Braille and voice call control, text conversation input and output. Multimedia services including transformation between different media forms of the same content to adapt to end-user capabilities. Automatic: text-to-speech or performed by people, including sign language interpretation. User-selectable media, including production, storage, transport, presentation and logical linking. Short range wireless accessible services to provide accessible features on communications equipment. Mechanisms for inter-working with mono-media services in an accessible way, e.g. text telephony and voice telephony. Multimedia metadata from an accessibility point of view to encourage inclusive design. Emergency service access for people who need to communicate in media other than voice, e.g. text, sign language, lip reading supported speech. Harmonization and maintenance of the text telephone service, for example when new technologies are specified for public switch network (PSTN) transmission. DCAD: Dynamic Coalition on Accessibility and Disability. Source: http://www.itu.int/themes/accessibility/dc/index.html. “Total Conversation” (defined in F.703) as a mainstream service and as included in any new multimedia conversation protocol: IP phones and other communications for including accessibility features in text, video, and alerting to maintain interoperability with legacy text telephones which includes support for “Total Conversation” beyond the needs of the deaf and guidance for implementers of relay systems for deaf and speech-impaired users.
ITU Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF), established in December 2007, reports to ITU-T Study Group 2, with copy to all other Study Groups http://www.itu.int/ITU-T/jca/ahf/index.html	Summarizes awareness, advice, assistance, collaboration, coordination and networking and to “grasp” opportunities to improve access to the information society by people with varied capability of handling information and the controls for its presentation. Improves usability for all people in the broadest sense. Coordinates and assists the ITU-T Study Group leadership to guide the creation of Recommendations that address the accessibility needs of end-users of telecommunication/ICT products and services. Identifies common interests, promoting collaboration, and disseminating information to and between external bodies, agencies, and projects addressing persons with disabilities, international user organizations interested in accessible telecommunications/ICT, professional societies for ergonomics/human factors and human-computer interaction, and Industry groups and academia to assist government and regulatory bodies with pertinent information enabling successful procurement.

Organization	Topic areas
Japanese Industrial Standards Committee (JISC) www.jisc.go.jp/eng/index.html	Consists of many national committees and plays a central role in standardization activities in Japan. Regarding accessibility and usability for consumer products including electric and electronic products, established Japanese Industrial Standards (JIS) include: JIS S0012, S0013, S0014, S0031, S0032, and S0033. For office equipment, JIS X 8341-1,2,3,4, and 5 are established. Establishment and maintenance of JIS, administration of accreditation and certification, participation and contribution in international standardization activities, and development of measurement standards and technical infrastructure for standardization.
Office of Disability Issues (UK) http://www.wcit.org.uk/Publications/main_content/ITDirectorsGuidetoAccessibleIT.pdf	Business case for accessible information provided to senior civil servants, relating it to their wider strategic objectives whilst making a real difference to people's lives. Producing information for disabled people: – ensure that disabled people are involved from the start; – provide information through a range of channels and formats; – ensure your information meets users' needs; – clearly signpost other services; – always define responsibility for information provision.
W3C Web Accessibility Initiative (WAI) http://www.w3.org/WAI/	Web content, authoring, user agents, guidelines regarded as the international standard for Web accessibility, support materials to help understand and implement Web accessibility, resources through international collaboration. WAI, in partnership with organizations around the world, pursues accessibility of the Web through the following five primary activities: – ensuring that core technologies of the Web support accessibility; – developing guidelines for Web content, user agents, and authoring tools; – facilitating development of evaluation and report tools for accessibility; – conducting education and outreach; – coordinating with research and development that can affect future accessibility of the Web.
United Nations (UN) http://www.un.org/disabilities/	Support for full and effective participation of persons with disabilities in social life and development, to advance the rights and protect the dignity of persons with disabilities and to promote equal access to employment, education, information, goods and services.
U.S. Access Board www.access-board.gov	Sponsors and coordinates research for use in developing accessibility guidelines and provides technical assistance to the public. Oversees a research program is focussed on the study of accessibility relating to architecture and design, communications, and transportation.

Organization	Topic areas
U.S. Federal Communications Commission (FCC) Disability Rights Office (DRO) www.fcc.gov	Addresses disability-related telecommunications matters, including telecommunications relay service (TRS) (Section 225) of the Telecommunications Act, access to telecommunications equipment and services by persons with disabilities (Section 255), access to emergency information, and closed captioning. Provides expert advice and assistance, as required, to other Bureaus and Offices, consumers, industry, and others on issues relevant to persons with disabilities. Initiate rulemakings for the development of disability policy; review relevant agenda items and other documents and coordinates with Bureaus and Offices to develop recommendations and propose policies to ensure that communications are accessible to persons with disabilities, in conformance with existing disability laws and policies. Works to support the U.S. Federal Communications Commission (FCC) goal of increasing accessibility of communications services and technologies for persons with disabilities.

6 Completed standards, technical reports, and projects

6.1 Compilation

Table 2 identifies some important completed standards, technical reports, and projects that either relate to each other or else stand alone. A case where two relate is ISO/TR 22411 and ISO/IEC Guide 71. ISO/TR 22411 presents ergonomics data and guidelines for applying ISO/IEC Guide 71. Guide 71 assists in addressing the needs of older persons and persons with disabilities in the development of standards. ISO/TR 22411 provides both ergonomics data and information about human abilities, including sensory, physical, cognitive, and allergies, as well as guidance about the various accessible designs of products, services, and environments.

6.2 Tabular list

The following table represents an attempt to list standards, technical reports, and projects that provide resources for standards developers.

Table 2 – Completed standards, technical reports, and projects

NOTE The abstracts for standards promulgated by ISO are available at **www.iso.ch**.

Advanced Television Systems Committee (ATSC)/A53B "Digital Television Standard, Parts 1-6, 2007, as adopted by the Federal Communications Commission (FCC)
Consumer Electronics Association (CEA) 608, Analogue TV closed captions and CEA 708, digital TV closed captions
CENELEC/BTWG 185, 101-5, Usability and safety of electrical products with reference of persons with special needs
Disability Rights Commission (DRC) and the British Standards Institute (BSI), Publicly Available Specification (PAS) 78 Guide to good practice in commissioning accessible Websites
EC Mandate/376, Standardisation mandate to CEN, CENELEC and ETSI in support of European accessibility requirements for public procurement of products and services in the ICT domain
European Telecommunications Standards Institute (ETSI) (1991), Guide for usability evaluations. ETSI/TC-HF(91)4
ISO 9241-171:2008, Ergonomics of human-system interaction – Part 171: Guidance on software accessibility
ISO 9241-11:1998, Ergonomic requirements for office work with visual display terminals (VDTs) – Part 11: Guidance on usability
ISO 9241-20:2008, Ergonomics of human-system interaction – Part 20: Requirements for office work with Visual Display Terminals (VDTs)
ISO 13407:1999, Human-centered design processes for interactive systems
ISO/DIS 24500-20XX,Ergonomics – Accessible design – Auditory signals for consumer products

ISO/DIS 24501:20XX, Ergonomics – Accessible design – Sound pressure levels of auditory signals for consumer products
ISO/DIS 24502:200XX, Ergonomics – Accessible design – Specification of age-related relative luminance in visual signs and displays
ISO/TR 22411:2008, Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities
ISO/IEC Guide 71:2001, Guidelines for standards developers to address the needs of older persons and persons with disabilities
ISO/IEC TR 9126-1:1991, Software engineering – Software product quality evaluation
ISO/IEC 10779:2008, Information technology – Office equipment accessibility guidelines for elderly persons and persons with disabilities
ISO/IEC 14598-1:1999, Information technology – Software product evaluation – Part 1: General overview
ISO/IEC 14756:1999, Information technology – Measurement and rating of performance of computer-based software systems
ISO/IEC 15026:1998, Information technology – System and software integrity levels
ISO/IEC 15504-2:2003, Software engineering - Process assessment - Part 2: Performing and assessment
ISO/IEC 15939:2002, Software engineering – Software measurement process
ISO/IEC 17050-1:2004, Conformity assessment – Supplier's declaration of conformity – Part 1: General requirements
ISO/IEC 17050-2:2004, Conformity assessment – Supplier's declaration of conformity – Part 2: Supporting documentation
ISO/IEC 19766:2007, Information technology – Guidelines for the design of icons and symbols accessible to all users, including the elderly and persons with disabilities
ISO/TR 22411:2008, Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities
ISO/IEC 24714-1:2008, Information technology – Biometrics – Jurisdictional and societal considerations for commercial applications – Part 1: General guidance
ISO/IEC 24751:2008-2009, Parts 1-3 Information Technology – Individualised adaptability in e-learning, education and training
ISO/IEC 25000:2005, Software engineering – Software product Quality Requirements and Evaluation (SQuaRE) – Guide to SQuaRE
ISO/IEC 25062:2006, Software engineering – Software product Quality Requirements and Evaluation (SQuaRE) – Common Industry Format (CIF) for usability test reports
ISO/IEC 29138-1:2009, Information technology – Accessibility considerations for people with disabilities – Part 1: User needs summary
ISO/IEC 29138-2:2009, Information technology – Accessibility considerations for people with disabilities – Part 2: Standards inventory
ISO/IEC 29138-3:2009, Information technology – Accessibility considerations for people with disabilities – Part 3: Guidance on user needs mapping (with template)
ITU-T – Recommendation ITU-T H.323, Annex G for text conversation in H.323 packet multimedia environment – Recommendation ITU-T H.324, Annex L for text conversation in low bit-rate multimedia applications – Recommendation ITU-T F.703 for multimedia conversation service description – Recommendation ITU-T, H-series Supplement, application profile for sign language and lip reading real time conversation using low bit rate video communication – Recommendation ITU-T F.790, telecommunications accessibility guidelines for older persons and persons with disabilities – ITU-T, Technical Paper FSTP-TACL, telecommunications accessibility checklist
General Principles of Universal Design Policy Source: http://www.mlit.go.jp/kisha/kisha05/01/010711/04.pdf
Japanese Industrial Standard (JIS) X 8341-1:2004, Guidelines for older persons and persons with disabilities – information and communications equipment, software and services – Part 1: Common Guidelines
JIS X 8341-2:2004, Guidelines for older persons and persons with disabilities – Information and communications equipment, software and services – Part 2: Information processing equipment

JIS X 8341-3:2004, Guidelines for older persons and persons with disabilities – Information and communications equipment, software and services – Part 3: Web content
JIS X 8341-4: 2005, Guidelines for older persons and persons with disabilities – Information and communications equipment, software and services – Part 4:Telecommunications equipment
JIS X 8341-5:2006, Guideline for older persons and persons with disabilities --- Information and communications equipment, software and services – Part 5: Office equipment
JIS Z 8071:2003, Guideline for standards developers to address the needs of older persons and persons with disabilities
ISO TC 159, ISO 9241-20:2008 Ergonomics of human-system interaction – Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services
Office of Disability Issues in the UK – Accessible information: the business case for senior civil servants, sets out the business case for accessible information provided to senior civil servants, relating it to their wider strategic objectives whilst making a real difference to people's lives. – Guide to Accessible IT addresses improving a disabled person's access to information on public services, based on "Five Principles for Producing Better Information for Disabled People"
United Nations (UN) Convention on the Rights of Persons with Disabilities
U.S. Access Board – Electronic Information Technology Accessibility Standards (Section 508) (2000) – Télécommunications Act Accessibilité Guidelines (1998) – Updaté Americans with Disabilities Act of 1990 (ADA) and Architectural Barriers Act of 1968 (ABA) Accessibilité Guidelines (2004) – ADA Accessibilité Guidelines (ADAAG) (1991, as amended through 2002 – ADA and ABA Accessibilité Standards – ADA Accessibilité Guideline (ADAAG) for Transportation Véhicules (1991, amendé 1998)
U.S. Federal Communications Commission (FCC) – Closed Captioning of Video Programming, 47 Code of Federal Regulations (C.F.R.) Section 79.1 – Access to Emergency Information on Television, 47 C.F.R. 79.2 – Section 255, Manufacturers of Equipment – Section 255, Service Providers (Access for Persons with Disabilities) – Section 504 Programs and Activities Accessibility Handbook ("Section 504 Handbook")
W3C, WCAG Web Content Accessibility Guidelines 2.0, ATAG Authoring Tool Accessibility Guidelines 2.0, WAI-ARIA Accessible Rich Internet Applications Version 1.0 (WD), and UAAG User Agent Accessibility Guidelines 2.0 (Working Draft)

7 User needs

7.1 A range of user needs extracted from ISO/IEC TR 29138-1:2009

The following user needs are extracted from the ISO/IEC TR 29138-1:2009. with permission.

7.2 Tabular list

The ISO SWG-A completed ISO/IEC TR 29138, parts 1, 2, and 3. The following Table 3 extracts from ISO/IEC TR 29138-1.

Table 3 – User needs (from ISO/IEC TR 29138-1:2009)

NOTE ISO/IEC TR 29138-1:2009 contains more detail, explanation, and context for the following user needs. The following is intended to provide a general overview.

User needs in perceiving visual information **Some users need ...**
visual information also available in auditory form
visual information also available in tactile form
sufficient brightness for visually presented information (luminance for displays, illumination for printed)
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
to be able to change the colours of information
text readable with reduced visual acuity NOTE 1 Automatically scroll large print text horizontally or vertically on a screen without the need to manually manipulate the source material.
information within viewable range of those of short stature or seated in wheelchairs
to avoid reflective glare
to avoid glare from excessive brightness (of material or surrounding)
to pause, and re-play information presented using audio, video or animation
to perceive foreground visual information in the presence of background
to see and hear text simultaneously
User needs in perceiving auditory information **Some users need...**
auditory information also available in visual form
auditory information also available in tactile form
to adjust the volume to a suitable level
auditory events, alerts etc, be multi-frequency
when vibration is used as a substitute for different auditory events, then some need vibration to have different vibration patterns (rather than vibration frequency of strength)
multi-channel auditory information available in monaural form
to pause, and re-play audio information
to perceive foreground audio information in the presence of background
to adjust the audio characteristics (e.g. pitch, balance)
User needs in perceiving existence and location of actionable components **Some users need...**
to locate and identify all keys and controls via non-visual means without activating them NOTE 2 Touch sensitive or very light touch controls located where they will not be touched while tactilely finding keys they must see to operate device.
to have non-actionable elements (logos, decorative details) not look or feel like buttons or controls
sufficient landmarks and cues to be able to quickly re-find all keys and controls during use NOTE 3 Nibs, groupings, and spacing are examples of tactile landmarks.
controls that visually contrast with their surroundings NOTE 4 Some benefit from the ability to adjust colors of the on-screen controls.
controls to be in places where they can be easily found with low vision and with no sight
controls within viewable range of people of short stature or seated in wheelchairs

focus and pointing indicators that are visible with low vision
information describing the layout of the operational parts
location and layout of controls to be consistent
User needs in perceiving status of controls and indicators
Some users need...
a non-visual equivalent to any visual indicators or operational cues, designed (power light) or intrinsic (e.g. visual movements)
a non-audio indicator for any auditory indicators or operational cues, designed (e.g. beeps, lights) or intrinsic (e.g. machine sounds, visual movements)
a non-tactile alternative to any subtle tactile feedback
alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators)
visual indicators (e.g. LEDs, on screen indicators, mouse cursors) that are visible with low vision
controls and indicators that are perceivable without relying on colour
sufficient quality (e.g. volume, direction, clarity, frequency) for audio cues
tactile indicators (i.e. for those who need indicators to be both non-visual and non-auditory)
information within viewable range of those of short stature or seated in wheelchairs
User needs in perceiving feedback from an operation
Some users need...
feedback to be audio or tactile (i.e. non-visual)
feedback to be tactile (i.e. both non-visual and non-auditory)
a visual or auditory alternative to any subtle tactile feedback
alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators)
visual feedback that is obvious with low vision
feedback that is perceivable without relying on colour
to adjust the colours to make things easier to read
sufficient quality (e.g. volume, direction, clarity, frequency) for audio feedback
audio feedback that does not require tone differentiation
visual or tactile feedback to occur at the same location as the control
clear feedback of connector engagement (e.g. power cord, PC card, USB™ connector, etc.)
feedback to be predictable
User needs in invoking and carrying out all actions
Some users need...
to operate all functionality using only tactilely discernable controls coupled with non-visual feedback NOTE 5 In order to operate products effectively and in available time (please see, below, “a method to fully operate the product that does not require much force” and “a method to fully operate the product that does not require pinching”), some need to be able to access all computer software functionality from the keyboard (or keyboard emulator) without any visual feedback.
to access all functionality without having to use touch or very light touch activated controls
to fully operate the product without requiring a pointing device
to access all computer software functionality from the keyboard (or keyboard emulator) with only visual feedback
an alternative method to operate any speech controlled functions
a method to fully operate the product that does not require simultaneous actions
a method to fully operate the product that does not require much force

a method to fully operate the product that does not require much continuous force
a method to fully operate the product that does not require much stamina (includes sustained or repeated activity without sufficient rest)
a method to fully operate the product that does not require much reach (weakness, stature, or wheelchair)
a method to fully operate the product that does not require tight grasping
a method to fully operate the product that does not require pinching
a method to fully operate the product that does not require twisting of the wrist
a method to fully operate the product that does not require direct body contact
a method to fully operate the product that does not require much accuracy of movement NOTE 6 Some need the customization of the object area where a double click is effective.
to adjust the speed and acceleration of input devices NOTE 7 Some need a setting for adjusting the acceleration of a pointer.
to operate the product with only a left or only a right hand
to operate the product without use of hands
to operate the product using only speech
alternatives to biometric means of identification
alternative modalities to text input
to have similar patterns of activation for similar actions
visual indication of keyboard shortcuts
User needs in completing actions and tasks within the time allowed **Some users need…**
much more time to read displayed information
much more time to complete actions – and no feeling of time pressure
information necessary to plan their actions in advance
the ability to avoid visual or auditory distractions that prevent focusing on a task
User needs to avoid unintentional activation of controls **Some users need…**
products and controls designed so they can be explored without activation, either tactilely or through keyboard navigation
to operate controls with tremor or spasmodic movements without inadvertent entries
controls that are not activated by a slight touch or when they receive keyboard focus
User needs in being able to recover from errors **Some users need…**
notification when the product detects errors made by the user
unambiguous guidance on what to do in the event of a reported error
a means (e.g. a mechanism) to go back and undo the last thing(s) they did
to reset (to initial condition)
User needs in having equivalent security and privacy **Some users need…**
private listening capability, when using audio alternatives to visual information in public places
protection of the privacy of their information, even if they are not able to do the “expected” things to protect it themselves

security of their information, even if they are not able to do the “expected” things to protect it themselves
User needs in avoiding personal risk
Some users need…
products where hazards are obvious, easy to avoid, and difficult to trigger
products that do not rely on specific senses or fine movement to avoid injury NOTE 8 An example could be products that don’t assume that body parts will never stray into openings or that only gentle body movements will occur around the products.
to use products safely without seeing hazards or warnings
to use products safely without hearing hazard warnings
to avoid visual patterns that cause them to have seizures
to avoid auditory patterns that cause them to have seizures
products that do not give off electromagnetic radiation NOTE 9 Users might have embedded devices (e.g. pacemakers, bionic interfaces to replacement limbs) and/or attached devices (e.g. drug-pumps or alarm cords) which could be sensitive to electromagnetism and are actually part of the “user”.
products that do not give off chemicals that they are allergic to NOTE 10 Further verification is needed to substantiate this user need for standard development purposes.
User needs in being able to efficiently operate product
Some users need…
alternate modes of operation that are effective given the time constraints of the task
keyboard navigation that follows a meaningful sequence through form controls
to increase the rate of audio alternatives (unless there are minimal audio alternatives)
system level accessibility preference settings that apply across applications
to have applications not override or defeat built-in accessibility features
accessibility preference settings preserved unless explicitly changed NOTE 11 Any applications that want to change accessibility features can ask the user first, and return the setting when the application ends.
preference settings to change immediately, preferably without requiring system reboot
to save and restore individual preference settings
accessibility functions that can be returned to an initial state individually or together after each user
hardcopy documents to be usable with one hand or mouth stick
structure when navigating long audio material
consistent and predictable user interfaces
User needs in understanding how to use a product
Some users need…
to get an overview and orient themselves to product and functions/parts without relying on visual presentation or markings on product
wording, symbols, and indicators used on products that are as easy to understand as possible given the device and task NOTE 12 Information and feedback is to be “salient” and “specific” rather than subtle or abstract in order to understand the information.
products or services to use standard conventions, words and symbols for their culture (cross-cultural if possible)
clear and easy activation mechanisms for any access features
navigation that supports different thinking styles
to understand product if they have difficulty thinking hierarchically

any text read aloud to them
steps for operations that are minimized and clearly described
interfaces that limit the memorization required of the user to operate them successfully
cues to assist them in multi-step operations
simple interfaces that only require them to deal with the controls they need (advanced or optional controls removed in some fashion)
each function on its own key rather than having keys change their functions but look/feel the same
to know that a product is usable by them and how to set it up to work for them
information presented in an alternative to text based representation
User needs in understanding the output or displayed material **Some users need...**
textual material to be worded as clearly and simply as possible
text, illustrations, and diagrams in spoken form
to not have device noise or regular audio output interfere with ability to understand accessibility audio
visual information generated by access features (such as captions) not to occur simultaneously with other visual information that they must view NOTE 13 For example, presenting captions that are not essential to understand any sign language.
image resolution and speed be sufficient to understand any sign language presented
to slow audio, video, or animated information down slightly
to replay, pause, change speed in order to understand information
to replay auditory information
enlargeable text word wrap that stays on screen and is understandable
feedback using pictures or symbols
to silence audio output
information presented in an alternative to text
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
information to be available regarding the meaning associated with colours and symbols
Ability to user assistive technology (AT) to control the ICT **Some users need...**
that the product not interfere with AT (e.g. no electrical noise interference with hearing devices)
to use their AT with the device (e.g. alternate display, amplifiers, or alternate controls)
full and efficient functional control of a product using their AT, including pass-through of user feedback and notifications such as error messages
an AT available that will work with new technologies, at the time of release of the new technology
User needs related to cross cutting issues **Some users need...**
new technologies that are accessible when they are released
to access the controls that allow them to turn on and adjust the built in accessibility features
an accessible path and a means to position oneself within reach of installed products
timely access to trained customer service personnel (e.g. help desk)
accessible training and support materials
electronic access to copyrighted and otherwise protected material
the product to be usable by those with multiple disabilities

a means to provide feedback about improvements to accessibility to meet their particular needs
product accessibility information to be disseminated to distributors, retailers, installers, system integrators, customer organizations, and people with disabilities
to have their accessibility functions available at all times, without disruption
product accessibility information to be disseminated to distributors, retailers, installers, system integrators, customer organizations, and people with disabilities
to have their accessibility functions available at all times, without disruption

8 Demographics

8.1 Population growth

The World Health Organization (WHO) reported that as of 2007, 500 million people, globally, are considered to be disabled. Although the term “disability” varies among the various P-members of IEC/TC 100, the represented populations are significant, experts are advised to seek data and information from the WHO and other organizations to gain a perspective of the demographics. Some specifics of the population of various countries follow. Notably, the reporting differs since the classification of disabilities differs.

8.2 Reports from various nations

Reportedly, in Japan, approximately 27 million people are aged over 65 years which equals 21, 5 % of the total population. This is expected to increase to 33,7 % in 2035. In Japan, 3,52 million people have physical disabilities which corresponds to 3,0 % of the population.

NOTE 1 Refer to: ISO/IEC JTC1 Special Working Group on Accessibility (SWG-A) Open Seminar of Information Accessibility in the World (June, 2008), Tokyo, Japan, www.jtc1access.org/additional.htm.

NOTE 2 Also refer to: Cabinet Office, 2008 White Paper on the Aging Society.

Other reports include the data and information for the EU population where 33 million people, aged over 50 years report disabilities. This is projected to increase to 46 million in 2050.

NOTE 3 Source: MEAC – Measuring Progress of E-Accessibility in Europe, Main Report, October 2007.

The U.S. reported, in 2007, a total population of 257, 2 million people of whom 54,0 million people, which equals 20 %, are over 50 years of age. Those over 60 years of age number 55, 0 million (21 %).

NOTE 4 Source: U.S. Department of Census, www.census.gov.

9 Public policies

9.1 Global policy

The UN Convention on The Rights of Persons with Disabilities (Annex A) sets forth a global policy. For various reasons, not all of the IEC/TC 100 P-Member countries adopt the UN policy, while the reasons for the adoption of these conventions by others vary. Perhaps all members should consider the policy if the intention is to introduce AV multimedia systems and equipment globally. Many countries are legislating to ensure that services for the general public are universally accessible across all domains including transport, buildings, healthcare, and general ICT.

9.2 Domestic policy

In Japan, there are two JISs (Z 8041 and X 8341) regarding ICT equipment accessibility. In the European Commission (EC), under “e-Inclusion,” the Commission aims to make ICT-based services accessible for the entire population and is working toward improving the

consistency of the accessibility requirements in public procurement and exploring the possible benefits of certification schemes and standardisation for accessible products.

The Federal Government of Germany aims to provide barrier-free design for all web sites in the Federal Ministries and agencies in order to ensure that users with disabilities have barrier-free access to all of the sites in the Federal Administration as laid down in the Act on Equal Opportunities for Disabled People (May 2002). The Ordinance on Barrier-free Information Technology was introduced in order to promote e-Accessibility. Specifically, people with disabilities should have access to all public Websites and Web-based services of federal agencies based on WCAG.

NOTE 1 Refer to: i2010 e-Inclusion National Report distributed at the Vienna Ministerial Event 30 November - 2 December 2008.

In the EC, the Commission has a mission to make ICT-based services accessible for the entire population: “e-Inclusion to improve the consistency of accessibility requirements in public procurement, explore the benefits of certification schemes and standards for accessible products, make better use of the accessibility potential of existing legislation, conduct an “analysis of testing and conformity schemes of products and services meeting accessibility requirements”, and produce European Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain.

NOTE 2 Refer to:Mandate M/376 – “European accessibility requirements for public procurement of products and services in the ICT domain”.

In the U.S., the Section 508 of the Rehabilitation Act (29 U.S.C), as amended by the Workforce Investment Act of 1998 (Public Law 105-220, dated 09/07/98) requires access to electronic and information technology procured by the Federal Agencies for use by people with disabilities. Since inaccessible technology interferes with an individual’s ability to obtain and use information quickly and easily, the U.S. Access Board developed accessibility standards for the various technologies covered by the Law. These standards have been adopted in the Federal Government’s procurement regulations to cover any item, piece of equipment, or system procured by the Federal Government, whether acquired commercially, modified, or customized such that the item, as practicable, provides features to increase, maintain, or improve the functional capabilities of individuals with disabilities.

The U.S. rules include traditional assistive technology hardware and software along with mainstream technology used as assistive technology, virtual assistive technology delivered as a Web service and integration of products into a system that provides assistive technology functions which allow individuals with disabilities to access electronic information technology. Some basic examples are text to speech software and character (letter) magnifiers.

10 Checklist of accessibility and usability considerations

The following checklist of accessibility and usability considerations (see Table 4) is proposed to assist experts who evaluate opportunities for integrating support for accessibility and usability in their work.

Table 4 – Checklist of accessibility and usability considerations

Area	Feature
Terms: universal design, accessibility, usability, disability, barrier free design, user needs, design for all (DFA)	A.1.Have the intent and meaning of these terms been considered? A.2.Has interchangeable terminology and the use of graphics, drawings, and/or images been considered? A.3.Has the extent to which the equipment and services will be used been considered? A.4.Has the scope of the disability (ies) been defined?
Universal design and usability	B.1.Has universal design been considered? B.2.Has usability been considered? B.3.Have the completed and ongoing projects been considered? B.4.Has the perception of visual information been considered? B.5.Has the perception of auditory information been considered? B.6.Has the output / displayed material been considered? B.7.Has the ability to use assistive technology been considered?
Operations	C.1.Has the perception of the existence and location of actionable components been considered? C.2.Has the perception of the status of controls and indicators been considered? C.3.Has the perception of feedback from an operation been considered? C.4.Has the ability to invoke and carry out all action including maintenance and setup been considered? C.5.Has the ability to complete actions and tasks within the time allowed been considered? C.6.Has the concept of protection from accidental activation been considered? C.7.Has the ability to recover from errors been considered? C.8.Have security and privacy based on listening and automatic protection of information been considered? C.9.Has the protection from personal risk been considered? C.10.Has the efficient operation of a product been considered?
Cross-cutting issues	D.1.Have new accessible technologies been considered? D.2.Have adjustments for built-in accessibilities been considered? D.3.Have access to customer service and training been considered? D.4.Have ways to provide feedback about improvements to accessibility been considered? D.5.Have accessibility functions and whether or not such functions are available at all times, without disruption, been considered? D.6.Have demographics aspects been considered? D.7.Have public policies been considered?

11 Summary

11.1 Use of terms and checklist

The use of terms to convey accessibility and/or usability remains a consideration for standards experts. In some cases, terms are similar and therefore interchangeable to reach as many people as possible. The checklists, in this Technical Report, address the practicalities of Universal Design and usability, operations, and cross-cutting issues, such as new technologies and built-in accessories so that everybody benefits including individuals with disabilities and the aging.

11.2 User needs and scenarios

This Technical Report extracts “user needs” from ISO/IEC TR 29138-1. A limitless number of scenarios exist for future accessibility and usability work projects in the AV multimedia equipment domain. Potentially, one can opt to apply existing standards to the work projects or develop new standards. In either case, this Technical Report provides a point of reference.

Annex A
(informative)

UN Convention on the Rights of Persons with Disabilities

A.1 Articles 9, 21, and 30

The UN Convention provides a recognized international standard for disabled people's human rights. Countries that ratify the convention will also have to report regularly to the UN about the steps they are taking to protect and promote disabled people's rights. The Convention was opened for signature 30 March 2007. Included in the UN Convention of the Rights of Persons with Disabilities are the following:

(Article 9) the Convention requires countries to identify and eliminate obstacles and barriers and ensure that persons with disabilities can access their environment, transportation, public facilities and services, and information and communications technologies.

(Article 21) Countries are to promote access to information by providing information intended for the general public in accessible formats and technologies, by facilitating the use of Braille, sign language and other forms of communication and by encouraging the media and Internet providers to make on-line information available in accessible formats.

(Article 30) Countries are to promote participation in cultural life, recreation, leisure and sport by ensuring provision of television programmes, films, theatre and cultural material in accessible formats, by making theatres, museums, cinemas and libraries accessible, and by guaranteeing that persons with disabilities have the opportunity to develop and utilize their creative potential not only for their own benefit, but also for the enrichment of society. Countries are to ensure their participation in mainstream and disability-specific sports.

A.2 Excerpts from Articles 9, 21, and 30

Excerpts follow:

1) To enable persons with disabilities to live independently and participate fully in all aspects of life, parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas (Article 9).
2) (Article 9) To include the identification and elimination of obstacles and barriers to accessibility for: information, communications and other services, including electronic services and emergency services, States Parties shall also take appropriate measures (including):
   - To promote access for persons with disabilities to new information and communications technologies and systems, including the Internet (Article 9).
   - To promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost (Article 9).
3) Providing information intended for the general public to persons with disabilities in accessible formats and technologies appropriate to different kinds of disabilities in a timely manner and without additional cost (Article 21).
4) Urging private entities that provide services to the general public, including through the Internet, to provide information and services in accessible and usable formats for persons with disabilities (Article 21).

5) Encouraging the mass media, including providers of information through the Internet, to make their services accessible to persons with disabilities (Article 21).

6) Persons with disabilities shall:

   (a) Enjoy access to cultural materials in accessible formats (Article 30);

   (b) Enjoy access to television programmes, films, theatre and other cultural activities, in accessible formats (Article 3).

NOTE Refer to: http://www.un.org/disabilities/

Annex B
(informative)

Comments about some IEC TC 100 standards which contain accessibility considerations

B.1 Excerpt from the IEC/TC 100: Technical area (TA) 10

The IEC/TC 100 standards provide specifications and guidance related to audio, video and multimedia formats, metrology, and architectures. The standards may assist with technology development and also developing other new standards to assist individuals with disabilities and the aging. When applying IEC/TC 100 standards, one may use all or part of the standards, themselves, to produce guidelines to declare accessibility and usability features and perhaps to meet some or all of the user needs listed in this Technical Report.

While the portfolio of IEC/TC 100 standards is quite large, and this Technical Report does not address all of the standards, those in IEC/TC 100 TA 10, known as "TA10", are discussed below.

B.2 TA 10 projects

The TA10 projects and completed standards which address multimedia electronic publishing (e-publishing) and e-book equipment include formats of multimedia e-book content, minimum requirements for multimedia e-book readers, user interfaces for multimedia e-book readers, e-publishing services, and guidelines for e-book distribution by interchangeable storage media. In fact, a TA10 new work item proposal (NWIP) 100/1618/NP, "Texture map for auditory presentation of printed content" is ongoing. The NWIP addresses a printed, visual map which represents encoded document content. As proposed, the map looks like a postage stamp. The "stamp" is read and transformed into speech. In summary, this NWIP, if codified as an IEC/TC 100 standard, would allow pages to be read to the user. The international acceptance of the proposal remains pending.

Other IEC/TC 100 standards, developed in the IEC/TC 100 TA10, include the following:

- IEC 62571–, Multimedia systems and equipment – Digital Audiobook File Format and Player Requirements[1]
  This standard addresses files which are helpful for people with visual impairments. The project has completed committee draft for voting stage and will be submitted for publication in 2009.
- IEC 62448:2007, Multimedia systems and equipment – Multimedia e-publishing and e-books – Generic format for e-publishing
  This standard provides an interchange data format for data preparers and publishers.

1 To be publixhed.