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DRAFT TANZANIA STANDARD

(Draft for comments only)

Communications and ICT products and services accessibility to persons with disabilities - requirements

TANZANIA BUREAU OF STANDARDS

First Edition

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1. Introduction

This standard specifies Communication and ICT products and services functional performance enabling people to get and use required mode of operation in accessing the necessary communication and information regardless of the disability type.

This Standard has been developed to guide Communication and ICT products and service providers on the minimum technical specifications for people with disabilities.

During the preparation of this Tanzania Standard, assistance was drawn from EN 301-549 V3.2.1 (2021-03) Accessibility Requirements for ICT Products and Services, (European Telecommunications Standards Institute, 2021);

2. Scope and Purpose

This Standard provides requirements for Communication and ICT services accessibility to persons with disabilities. It specifies the functional accessibility requirements applicable to Communication and ICT products and services. It covers both software and hardware as well as services to be used with web-based, non-web and hybrid technologies

3. Normative references

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

ISO/IEC 40500:2012: *Information technology — W3C Web Content Accessibility Guidelines (WCAG) 2.0*

ITU-T G.722 SERIES G: *TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS Digital terminal equipments – Coding of voice and audio signals*

ITU-T G.722.2 SERIES G: *TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS Digital terminal equipments – Coding of analogue signals by methods other than pulse* code *modulation (PCM)*

ITU-T T.140 SERIES T: *TERMINALS FOR TELEMATIC SERVICES*

ITU-T V.18 *Operational and interworking requirements for DCEs operating in the text telephone mode*

IETF RFC 4103: *Real-time Transport Protocol (RTP)-Text. RTP Payload for Text Conversation*

ETSI TS 126 114: *Universal Mobile Telecommunications System (UMTS);LTE;5G;IP Multimedia Subsystem (IMS);Multimedia telephony;Media handling and interaction (3GPP TS 26.114 version 16.6.1 Release 16)*

ETSI TS 122 173: *Digital cellular telecommunications system (Phase 2+) (GSM);Universal Mobile Telecommunications System (UMTS);LTE;IP Multimedia Core Network Subsystem (IMS)Multimedia Telephony Service and supplementary services;Stage 1 (3GPP TS 22.173 version 16.3.0 Release 16)*

ETSI TS 134 229: *Universal Mobile Telecommunications System (UMTS);LTE;Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.229-1 version 15.3.0 Release 15)*

ITU-T F.703: *SERIES F: NON-TELEPHONE TELECOMMUNICATION SERVICES-Audiovisual services*

ETSI ES 200 381-1: *Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids;Part 1: Fixed-line speech terminals*

ETSI ETS 300 381: *Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids*

TIA-1083-A: *Telecommunications Communications Products Handset Magnetic Measurement Procedures and Performance Requirements*

ETSI ES 200 381-2: *Telephony for hearing impaired people; Inductive coupling of telephone earphones to hearing aids; Part 2: Cellular speech terminals*

ANSI/IEEE C63.19: *Methods Of Measurement Of Compatibility Between Wireless Communications Devices And Hearing Aids*

ETSI ES 202 975: *Human Factors (HF); Requirements for relay services*

User Agent Accessibility Guidelines (UAAG) 2.0

Authoring Tool Accessibility Guidelines (ATAG) 2.0

Web Content Accessibility Guidelines 2.1

4. Definitions and Abbreviations

4.1 accessibility

extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of user needs, characteristics and capabilities, to achieve identified goals in identified contexts of use

Note 1: Context of use includes direct use or use supported by assistive technologies.

Note 2: The context in which the ICT is used may affect its overall accessibility. This context could include other products and services with which the ICT may interact.

4.2 access space
space intended to be occupied by the person, including their assistive technology, while they are using the product

4.3 Assistive Listening Devices (ALDs)
devices that help separate the sounds, particularly speech, that a person wants to hear from background noise by bringing sound directly into the ear

Note: These are often found in meetings and public venues such as play grounds, concerts and places of worship. They can also be used at home with televisions and other products with auditory output.

4.4 Assistive product
any product (including devices, equipment, instruments and software), especially produced or generally available, used by or for persons with disability for participation, to protect, support, train, measure or substitute for body functions/structures and activities, or to prevent impairments, activity limitations or participation restrictions

4.5 Assistive Technology (AT)
equipment, product system, hardware, software or service that is used to increase, maintain or improve capabilities of individuals [ISO/IEC Guide 71:2014]

Note 1: Assistive technology is an umbrella term that is broader than assistive products.

Note 2: Assistive technology can include assistive services, and professional services needed for assessment, recommendation and provision.

Note 3: Where ICT does not support directly connected assistive technology, but which can be operated by a system connected over a network or other remote connection, such a separate system (with any included assistive technology) can also be considered assistive technology. This is an additional note, not included in ISO/IEC Guide 71:2014

4.6 audio description
additional audible narrative, interleaved with the dialogue, which describes the significant aspects of the visual content of audio-visual media that cannot be understood from the main soundtrack alone

Note: This is also variously described using terms such as "video description" or variants such as "descriptive narration".

4.7 authoring tool
software that can be used to create or modify content

Note 1: An authoring tool may be used by a single user or multiple users working collaboratively.

Note 2: An authoring tool may be a single stand-alone application or be comprised of collections of applications.

Note 3: An authoring tool may produce content that is intended for further modification or for use by end-users.

4.8 Braille

Braille is a system of raised dots that can be read with the fingers by people who are blind or who have low vision.

Note

1. Teachers, parents, and others who are not visually impaired ordinarily read braille with their eyes.

2. Braille is not a language. Rather, it is a code by which many languages—such as Swahili, English, Spanish, Arabic, Chinese, and dozens of others—may be written and read.

4.9 caption

Is a transcription of dialogue and are primarily used to help viewers who can not hear audio/video

4.10 closed functionality

functionality that is limited by characteristics that prevent a user from attaching, installing or using assistive technology

4.11 communications assistant

person working in a relay service with major conversions, as a human intermediary (including sign language interpreters for video relay services)

Note: also known as interpreter, operator, call handler, telephone operator, etc.

4.12 content

information and sensory experience to be communicated to the user by means of software, including code or mark-up that defines the content's structure, presentation, and interactions

Note: Content occurs in three places: web pages, documents and software. When content occurs in a web page or a document, a user agent is needed in order to communicate the content's information and sensory experience to the user. When content occurs in software, a separate user agent is not needed in order to communicate the content's information and sensory experience to the user - the software itself performs that function.

4.13 context of use

combination of users, goals and tasks, resources, and environment

Note: The "environment" in a context of use includes the technical, physical, social, cultural and organizational environments.

4.14 disabilities

loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical, mental or social factors

4.15 document

logically distinct assembly of content (such as a file, set of files, or streamed media) that functions as a single entity rather than a collection, that is not part of software and that does not include its own user agent.

Note 1: A document always requires a user agent to present its content to the user.

Note 2: Letters, e-mail messages, spreadsheets, books, pictures, presentations, and movies are examples of documents.

Note 3: Software configuration and storage files such as databases and virus definitions, as well as computer instruction files such as source code, batch/script files, and firmware, are examples of files that function as part of software and thus are not examples of documents. If and where software retrieves "information and sensory experience to be communicated to the user" from such files, it is just another part of the content that occurs in software and is covered by WCAG like any other parts of the software. Where such files contain one or more embedded documents, the embedded documents remain documents under this definition.

Note 4: A collection of files zipped together into an archive, stored within a single virtual hard drive file, or stored in a single encrypted file system file, do not constitute a single document when so collected together. The software that archives/encrypts those files or manages the contents of the virtual hard drive does not function as a user agent for the individually collected files in that collection because that software is not providing a fully functioning presentation of that content.

Note 5: Anything that can present its own content without involving a user agent, such as a self-playing book, is not a document but is software.

Note 6: A single document may be composed of multiple files such as the video content and closed caption text.
This fact is not usually apparent to the end-user consuming the document/content.
Note 7: An assembly of files that represented the video, audio, captions and timing files for a movie is an example of a document.

Note 8: A binder file used to bind together the various exhibits for a legal case would not be a document.
Note 9: Documents may contain sub-documents.

4.16 embedded

directly included in the content that is downloaded to the user agent and its extension, and is intended to be used in rendering the web page

Note: Something that is downloaded using a mechanism on the web page but is not used in rendering the page is not "embedded" in the page.

4.17 Hybrid Technologies

These refer to technologies that combine elements of both web-based and non-web-based technologies. For example, a mobile application might rely on web content for some features while also incorporating native functionality.

4.18 Information and Communication Technology (ICT)

technology, equipment, or interconnected system or subsystem of equipment for which the principal function is the creation, conversion, duplication, automatic acquisition, storage, analysis, evaluation, manipulation, management, movement, control, display, switching, interchange, transmission, reception, or broadcast of data or information

Note: Examples of ICT are web pages, electronic content, telecommunications products, computers and ancillary equipment, software including mobile applications, information kiosks and transaction machines, videos, IT services, and multifunction office machines which copy, scan, and fax documents.

4.19 ICT network

technology and resources supporting the connection and operation of interconnected ICT

4.20 mechanically operable part

operable part that has a mechanical interface to activate, deactivate, or adjust the ICT

Note: Examples of mechanically operable parts include scanner covers, notebook docking stations and lids as well as physical switches and latches.

4.21 mechanism for private listening

auditory output designed so that only the current user can receive the sound

Note: Personal headsets, directional speakers and audio hoods are examples of mechanisms for private listening.

4.22 Non-Web

These are contents that are not primarily delivered through a web browser or accessed over the internet. Examples include standalone software applications, mobile applications, desktop applications, and documents such as PDFs and Word documents.

4.23 User agent

software that retrieves and presents content for users

Note : User agent include browsers, browser extensions, media players, readers and other applications that render web contents

4.24 Web

These refer to contents that are primarily delivered through a web browser and accessed over the internet. Examples include websites, web applications, and web-based services.

5. ICT Products and Services Functional Performance

This specify the functional accessibility requirements applicable to ICT products and services. It covers both software and hardware as well as services to be used with web-based, non-web and hybrid technologies

5.1 Usage without vision

Where ICT provides visual modes of operation, there shall be at least one mode of operation that does not require vision.

Notes

1. A web page or application with a well formed semantic structure can allow users without vision to identify, navigate and interact with a visual user interface
2. Audio and tactile user interfaces may contribute towards meeting this clause

5.2 Usage with limited vision including persons with Albinism

Where ICT provides visual modes of operation, the ICT shall provide features that enable users to make better use of their limited vision. This is essential for users with limited vision and benefits many more users in different situations.

Notes

1. Magnification, reduction of required field of vision and control of contrast, brightness and intensity can contribute towards meeting this clause.
2. Where significant features of the user interface are dependent on depth perception, the provision of additional methods of distinguishing between the features may contribute towards meeting this clause
3. Users with limited vision may also benefit from non-visual access.

5.3 Usage without perception of colour

Where ICT provides visual modes of operation, the ICT shall provide a visual mode of operation that does not require user perception of colour. This is essential for users with limited colour perception and benefits many more users in different situations.

Note - Where significant features of the user interface are colour-coded, the provision of additional methods of distinguishing between the features may contribute towards meeting this clause. Example of additional features includes high contrast, alternative texts, patterns and textures, symbol and icon design, colour blind-friendly palettes, clear labelling and interactive feedback.

5.4 Usage without hearing

Where ICT provides auditory modes of operation, the ICT shall provide at least one mode of operation that does not require hearing. This is essential for users without hearing and benefits many more users in different situations.

Note : Visual and tactile user interfaces, including those based on sign language, may contribute towards meeting this clause.

5.5 Usage with limited hearing

Where ICT provides auditory modes of operation, the ICT should provide enhanced audio features. This is essential for users with limited hearing and benefits many more users in different situations.

Notes

1. Enhancement of the audio clarity, reduction of background noise, providing a joint monaural option, adjustment of balance of both audio channels, increased range of volume and greater volume in the higher frequency range can contribute towards meeting this clause
2. Allowing the use of Assistive Listening Devices, such as headsets with noise cancellation (connected by cable, Bluetooth or WLAN) can contribute towards meeting this clause
3. Users with limited hearing may also benefit from non-hearing access

5.6 Usage with no or limited vocal capability

Where ICT requires vocal input from users, the ICT shall provide at least one mode of operation that does not require them to generate vocal output. This is essential for users with no or limited vocal capability and benefits many more users in different situations.

Notes

1. Vocal output includes speech and other orally generated sounds, such as whistles and clicks.
2. Keyboard, pen or touch user interfaces may contribute towards meeting this clause.

5.7 Usage with limited manipulation or strength

Where ICT requires manual actions, the ICT should provide features that enable users to make use of the ICT through alternative actions not requiring manipulation, simultaneous action or hand strength. This is essential for users with limited manipulation or strength and benefits many more users in different situations.

Notes

1. Examples of operations that users may not be able to perform include those that require fine motor control, path dependant gestures, pinching, twisting of the wrist, tight grasping, or simultaneous manual actions.
2. One-handed operation, sequential key entry and speech user interfaces may contribute towards meeting this clause.

3. Some users have limited hand strength and may not be able to achieve the level of strength to perform an operation. Alternative user interface solutions that do not require hand strength may contribute towards meeting this clause.

5.8 Usage with limited reach

Where ICT products are free-standing or installed, all the elements required for operation should be within reach of all users. This is essential for users with limited reach and benefits many more users in different situations.

Note - Considering the needs of wheelchair users and the range of user statures in the placing of operational elements of the user interface may contribute towards meeting this clause

5.9 Minimize photosensitive seizure triggers

Where ICT provides visual modes of operation, the ICT shall provide at least one mode of operation that minimizes the potential for triggering photosensitive seizures. This is essential for users with photosensitive seizure triggers.

Note - Limiting the area and number of flashes per second may contribute towards meeting this clause

5.10 Usage with limited cognition, language or learning

The ICT should provide features and/or presentation that makes it simpler and easier to understand, operate and use. This is essential for users with limited cognition, language or learning, and benefits many more users in different situations.

Notes

1. Adjustable timings, error indication and suggestion, and a logical focus order are examples of design features that may contribute towards meeting this clause
2. Providing an audio output of the text is an example of providing support for people with limited reading abilities.
3. Providing spelling aid and word prediction of the text is an example of providing support for people with limited writing abilities.
4. Interaction with content can be made easier, and less prone to errors, by presenting tasks in steps that are easy to follow.

5.11 Privacy

Where ICT shall provide features for accessibility, the ICT maintains the privacy of users of these features at the same level as other users.

Note - Enabling the connection of personal headsets for private listening, not providing a spoken version of characters being masked and enabling user control of

legal, financial and personal data are examples of design features that may contribute towards meeting this clause.

6. Generic Requirements

6.1 Closed Functionality

ICT has closed functionality for many reasons, including design or policy. Some of the functionality of products can be closed because the product is self-contained and users are precluded from adding peripherals or software in order to access that functionality. ICT may have closed functionality in practice even though the ICT was not designed, developed or supplied to be closed. Computers that do not allow end-users to adjust settings or install software are functionally closed.

ICT may close some, but not all, of its functionalities. Only the closed functionalities have to conform to the requirements of 6.1

6.1.1 Assistive technology

Where ICT has closed functionality, that closed functionality shall be operable without requiring the user to attach, connect or install assistive technology and shall comply with the generic requirements of 6.1.2 to 6.1.6 as applicable

Personal headsets and personal induction loops shall not be classified as assistive technology for the purpose of this clause.

6.1.2 Non-visual access

6.1.2.1 Audio output of visual information

Where visual information is needed to enable the use of those functions of ICT that are closed to assistive technologies for screen reading, ICT shall provide at least one mode of operation using non-visual access to enable the use of those functions.

Notes

1. Non-visual access may be in an audio form, including speech, or a tactile form such as braille for deaf- blind users
2. The visual information needed to enable use of some functions may include operating instructions and orientation, transaction prompts, user input verification, error messages and non-text content.

6.1.2.2 Auditory output delivery including speech

Where auditory output is provided as non-visual access to closed functionality, the auditory output shall be delivered:

a) either directly by a mechanism included in or provided with the ICT; or
b) by a personal headset that can be connected through a 3.5 mm audio jack, or any industry standard connection, without requiring the use of vision.

Notes

1. Mechanisms included in or provided with ICT may be, but are not limited to, a loudspeaker, a built-in handset/headset, or other industry standard coupled peripheral.
2. An industry standard connection could be a wireless connection, USB.
3. Some users may benefit from the provision of an inductive loop (hearing loop for people with hearing aids)

6.1.2.3 Auditory output correlation

Where auditory output is provided as non-visual access to closed functionality, and where information is displayed on the screen, the ICT should provide auditory information that allows the user to correlate the audio with the information displayed on the screen.

Notes

1. An audio alternative that is both complete and complementary includes all visual information such as focus or highlighting, so that the audio can be correlated with information that is visible on the screen at any point in time
2. Examples of auditory information that allows the user to correlate the audio with the information displayed on the screen include structure and relationships conveyed through presentation.

6.1.2.4 Speech output user control

Where speech output is provided as non-visual access to closed functionality, the speech output shall be capable of being interrupted and repeated when requested by the user, where permitted by security requirements.

Notes

1. It should allow the user to pause speech output rather than just allowing them to interrupt it
2. It should allow the user to repeat only the most recent portion rather than requiring play to start from the beginning
3. The user should be able to select the content length of the speech output they want to repeat. This includes by character, word, line or paragraph. It is now common on text to speech engines such as screen readers

6.1.2.5 Speech output automatic interruption

Where speech output is provided as non-visual access to closed functionality, the ICT shall interrupt current speech output when a user action occurs and when new speech output begins.

Note - Where it is essential that the user hears the entire message, for example, a safety instruction or warning, the ICT shall block all user action so that speech is not interrupted.

6.1.2.6 Speech output for non-text content

Where ICT presents non-text content, the alternative for non-text content shall be presented to users via speech output unless the non-text content is purely for decoration or is used only for visual formatting. The speech output for non-text content shall follow the guidance for "text alternative" described in WCAG 2.1, Success Criterion 1.1.1.

6.1.2.7 Speech output for video information

Where pre-recorded video content is needed to enable the use of closed functions of ICT and where speech output is provided as non-visual access to closed functionality, the speech output shall present equivalent information for the pre-recorded video content.
Note - This speech output can take the form of an audio description or an auditory transcript of the video content

6.1.2.8 Masked entry

Where auditory output is provided as non-visual access to closed functionality, and the characters displayed are masking characters, the auditory output shall not be a spoken version of the characters entered unless the auditory output is known to be delivered only to a mechanism for private listening, or the user explicitly chooses to allow non-private auditory output.

Notes

1. Masking characters are usually displayed for security purposes and include, but are not limited to asterisks representing personal identification numbers
2. Unmasked character output may be preferred when closed functionality is used, for example, in the privacy of the user's home. A warning highlighting privacy concerns may be appropriate to ensure that the user has made an informed choice.

6.1.2.9 Private access to personal data

Where auditory output is provided as non-visual access to closed functionality, and the output contains data that is considered to be private according to the applicable privacy policy, the corresponding auditory output shall only be delivered through a mechanism for private listening that can be connected without requiring the use of vision, or through any other mechanism explicitly chosen by the user.

Notes

1. This requirement does not apply in cases where data is not defined as being private according to the applicable privacy policy or where there is no applicable privacy policy.
2. Non-private output may be preferred when closed functionality is used, for example, in the privacy of the user's home. A warning highlighting privacy concerns may be appropriate to ensure that the user has made an informed choice.

6.1.2.10 Non-interfering audio output

Where auditory output is provided as non-visual access to closed functionality, the ICT shall not automatically play at the same time any interfering audible output that lasts longer than three seconds.

6.1.2.11 Private listening volume

Where auditory output is provided as non-visual access to closed functionality and is delivered through a mechanism for private listening, ICT shall provide at least one non-visual mode of operation for controlling the volume.

6.1.2.12 Speaker volume

Where auditory output is provided as non-visual access to closed functionality and is delivered through speakers on ICT, a non-visual incremental volume control shall be provided with output amplification up to a level of at least 65 dBA.
Note - For noisy environments should not exceed 85 dBA.

6.1.2.13 Volume reset

Where auditory output is provided as non-visual access to closed functionality, a function that resets the volume to be at a level of 65 dBA or less after every use, shall be provided, unless the ICT is dedicated to a single user.
Note - A feature to disable the volume reset function may be provided in order to enable the single-user exception to be met.

6.1.2.14 Spoken languages

Where speech output is provided as non-visual access to closed functionality, speech output shall be in the same human language as the displayed content provided, except:

a) for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text;
b) where the content is generated externally and not under the control of the ICT vendor, this clause shall not be required to apply for languages not supported by the ICT's speech synthesizer;
c) for displayed languages that cannot be selected using non-visual access; and
d) where the user explicitly selects a speech language that is different from the language of the displayed content.

6.1.2.15 Non-visual error identification

Where speech output is provided as non-visual access to closed functionality and an input error is automatically detected, speech output shall identify and describe the item that is in error.

6.1.2.16 Receipts, tickets, and transactional outputs

Where ICT is closed to visual access and provides receipts, tickets or other outputs as a result of a selfservice transaction, speech output shall be provided and shall include all information necessary to complete or verify the transaction

In the case of ticketing machines, printed copies of itineraries and maps shall not be required to be audible
Note - The speech output may be provided by any element of the total ICT system

6.1.3 Functionality closed to text enlargement

Where any functionality of ICT is closed to the text enlargement features of platform or assistive technology, the ICT shall provide a mode of operation where the text and images of text necessary for all functionality is displayed in such a way that a non-accented capital "H" subtends an angle of at least 0.7 degrees at a viewing distance specified by the supplier.

The subtended angle, in degrees, may be calculated from:

$$\Psi = (180\ x\ H) / (\pi\ x\ D)$$

Where:
Ψ is the subtended angle in degrees
H is the height of the text

D is the viewing distance
D and H are expressed in the same units

- ✓ The intent is to provide a mode of operation where text is large enough to be used by most users with low vision.
- ✓ Table 1 and Figure 6.1 illustrate the relationship between the maximum viewing distance and minimum character height at the specified minimum subtended angle.

Table 1 — Relationship between maximum design viewing distance and minimum character height at the limit of subtended angle

Minimum subtended angle	Maximum design viewing distance (mm)	Minimum character height (mm)
0.7 degrees	100	1.2
	200	2.4
	250	3.1
	300	3.7
	350	4.3
	400	4.9
	450	5.5
	500	6.1
	550	6.7
	600	6.3

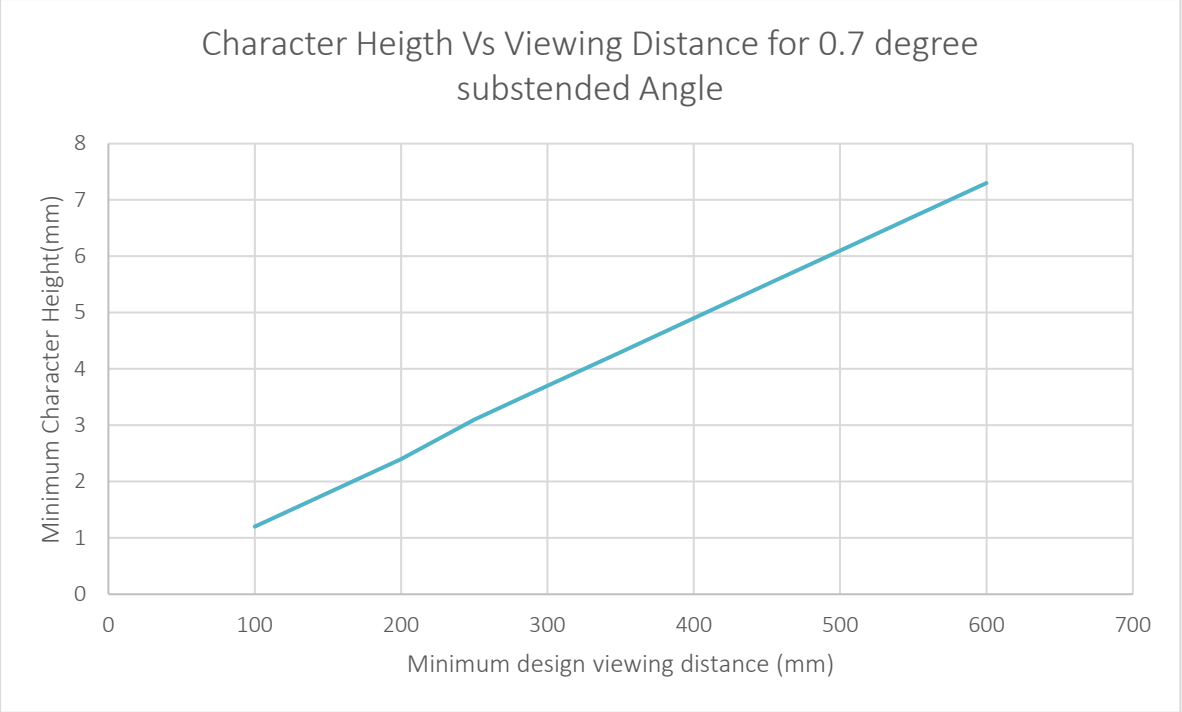

Figure 6.1: Relationship between minimum character height and maximum design viewing distance

6.1.4 Visual output for auditory information

Where auditory information is needed to enable the use of closed functions of ICT, the ICT shall provide visual information that is equivalent to the auditory output.
Note - This visual information can take the form of captions or text transcripts

6.1.5 Operation without keyboard interface

6.1.5.1 Closed functionality

Where ICT functionality is closed to keyboards or keyboard interfaces, all functionality shall be operable without vision as required in 6.1.2.

6.1.5.2 Input focus

Where ICT functionality is closed to keyboards or keyboard interfaces and where input focus can be moved to a user interface element, it shall be possible to move the input focus away from that element using the same mechanism, in order to avoid trapping the input focus.

6.1.6 Access without speech

Where speech is needed to operate closed functions of ICT, the ICT shall provide at least one mode of operation using an alternative input mechanism that does not require speech.

6.2 Activation of accessibility features

Where ICT has documented accessibility features, it shall be possible to activate those documented accessibility features that are required to meet a specific need without relying on a method that does not support that need.

6.3 Biometrics

Where ICT uses biological characteristics, it shall not rely on the use of a particular biological characteristic as the only means of user identification or for control of ICT.

Notes:

1. Alternative means of user identification or for control of ICT could be non-biometric or biometric.
2. Biometric methods based on dissimilar biological characteristics increase the likelihood that individuals with disabilities possess at least one of the specified biological characteristics. Examples of dissimilar biological characteristics are fingerprints, eye retinal patterns, voice, and face.

6.4 Preservation of accessibility information during conversion

Where ICT converts information or communication, it shall preserve all documented non-proprietary information that is provided for accessibility, to the extent that such information can be contained in or supported by the destination format.

6.5 Operable parts

6.5.1 Means of operation

Where ICT has operable parts that require grasping, pinching, or twisting of the wrist to operate, an accessible alternative means of operation that does not require these actions shall be provided.

6.5.2 Operable parts discernibility

Where ICT has operable parts, it shall provide a means to discern each operable part, without requiring vision and without performing the action associated with the operable part.

Note – One way of meeting this requirement is by making the operable parts tactilely discernible.

6.6 Locking or toggle controls

6.6.1 Tactile or auditory status

Where ICT has a locking or toggle control and the status of that control is visually presented to the user, the ICT shall provide at least one mode of operation where the status of the control can be determined either through touch or sound without operating the control.

Notes

1. Locking or toggle controls are those controls that can only have two or three states and that keep their state while being used.
2. An example of a locking or toggle control is the "Caps Lock" key found on most keyboards. Another example is the volume button on a pay telephone, which can be set at normal, loud, or extra loud volume.

6.6.2 Visual status

Where ICT has a locking or toggle control and the status of the control is non-visually presented to the user, the ICT shall provide at least one mode of operation where the status of the control can be visually determined when the control is presented.

Notes

1. Locking or toggle controls are those controls that can only have two or three states and that keep their state while being used.
2. An example of a locking or toggle control is the "Caps Lock" key found on most keyboards. An example of making the status of a control determinable is a visual status indicator on a keyboard.

6.7 Key repeat

Where ICT has a key repeat function that cannot be turned off:

a) the delay before the key repeat shall be adjustable to at least 2 seconds; and
b) the key repeat rate shall be adjustable down to one character per 2 seconds.

6.8 Double-strike key acceptance

Where ICT has a keyboard or keypad, the delay after any keystroke during which an additional key-press will not be accepted if it is identical to the previous keystroke. This delay shall be adjustable up to at least 0.5 seconds.

6.9 Simultaneous user actions

Where ICT has a mode of operation requiring simultaneous user actions for its operation, such ICT shall provide at least one mode of operation that does not require simultaneous user actions to operate the ICT.

Note - Having to use both hands to open the lid of a laptop, having to press two or more keys at the same time or having to touch a surface with more than one finger are examples of simultaneous user actions.

7. ICT with two-way voice communication

7.1 Audio bandwidth for speech

Where ICT provides two-way voice communication, in order to provide good audio quality, the ICT shall be able to encode and decode two-way voice communication with a frequency range with an upper limit of at least 7000 Hz.

Notes
1. For the purposes of interoperability, support of Recommendation ITU-T G.722 is widely used.
2. Where codec negotiation is implemented, other standardized codecs such as those found in Recommendation ITU-T.G.722.2 are sometimes used so as to avoid transcoding.

7.2 Real-Time Text (RTT) functionality

7.2.1 RTT provision

7.2.1.1 RTT communication

Where ICT is in a mode that provides a means for two-way voice communication, the ICT shall provide a means for two-way RTT communication, except where this would require design changes to add input or output hardware to the ICT.

Notes:

1. This requirement includes those products which do not have physical display or text entry capabilities but have the capability to connect to devices that do have such capabilities. It also includes intermediate ICT between the endpoints of the communication.

2. There is no requirement to add: a hardware display, a hardware keyboard, or hardware to support the ability to connect to a display or keyboard, wired or wirelessly, if this hardware would not normally be provided.
3. For the purposes of interoperability, support of Recommendation ITU-T T.140 is widely used.

4. This is to enable the recipient to read the message as it is being written, and respond in real-time simultaneously.

7.2.1.2 Concurrent voice and text

Where ICT provides a means for two-way voice communication and for users to communicate by RTT, it shall allow concurrent voice and text through a single user connection.

Notes

1. With many-party communication, as in a conference system, it is allowed (but not required or necessarily recommended) that RTT be handled in a single display field and that "turn-taking" be necessary to avoid confusion (in the same way that turn-taking is required for those presenting/talking with voice).
2. With many-party communication, best practice is for hand-raising for voice users and RTT users to be handled in the same way, so that voice and RTT users are in the same queue.
3. With a many-party conference system that has chat as one of its features - the RTT (like the voice) would typically be separate from the chat so that RTT use does not interfere with chat (i.e. people can be messaging in the chat field while the person is presenting/talking with RTT - in the same manner that people message using the chat feature while people are talking with voice). RTT users would then use RTT for presenting and use the chat feature to message while others are presenting (via voice or RTT).
4. The availability of voice and RTT running concurrently (and separately from chat) can also allow the RTT field to support text captioning when someone is speaking (and it is therefore not being used for RTT since it is not the RTT user's turn to speak).
5. Where both server-side software and local hardware and software are required to provide voice communication, where neither part can support voice communication without the other and are sold as a unit for the voice communication function, the local and server-side components are considered a single product.

7.2.2 Display of RTT

7.2.2.1 Visually distinguishable display

Where ICT has RTT send and receive capabilities, displayed sent text shall be visually differentiated from, and separated from, received text.

Note - The ability of the user to choose between having the send and receive text be displayed in-line or separately and with options to select, allows users to display RTT in a form that works best for them. This would allow Braille users to use a single field and take turns and have text appear in the sequential way that they may need or prefer.

7.2.2.2 Programmatically determinable send and receive direction

Where ICT has RTT send and receive capabilities, the send/receive direction of transmitted/received text shall be programmatically determinable, unless the RTT is implemented as closed functionality.

Note - This enables screen readers to distinguish between incoming text and outgoing text when used with RTT functionality.

7.2.2.3 Speaker identification

Where ICT has RTT capabilities, and provides speaker identification for voice, the ICT shall provide speaker identification for RTT.

Note - This is necessary to enable both voice and RTT participants to know who is currently communicating, whether it be in RTT or voice.

7.2.2.4 Visual indicator of audio with RTT

Where ICT provides two-way voice communication, and has RTT capabilities, the ICT shall provide a real-time visual indicator of audio activity on the display.

Notes

1. The visual indicator may be a simple character position on the display that flickers on and off to reflect audio activity, or presentation of the information in another way that can be both visible to sighted users and passed on to deaf-blind users who are using a braille display.
2. Without this indication, a person who lacks the ability to hear does not know when someone is talking.

7.2.3 Interoperability

Where ICT with RTT functionality interoperates with other ICT with RTT functionality (as required by clause 7.2.1.1) they shall support the applicable RTT interoperability mechanisms described below:

a) ICT interoperating with other ICT directly connected to the Public Switched Telephone Network (PSTN), using Recommendation ITU-T V.18 or any of its annexes for text telephony signals at the PSTN interface;
b) ICT interoperating with other ICT using VOIP with Session Initiation Protocol (SIP) and using RTT that conforms to IETF RFC 4103. For ICT interoperating with other ICT using the IP Multimedia Sub-System (IMS) to implement VOIP, the set of protocols specified in ETSI TS 126 114, ETSI TS 122 173 and ETSI TS 134 229 describe how IETF RFC 4103 would apply;
c) ICT interoperating with other ICT using technologies other than a) or b), above, using a relevant and applicable common specification for RTT exchange that is published and available for the environments in which they will be operating.

This common specification shall include a method for indicating loss or corruption of characters; and

d) ICT interoperating with other ICT using a standard for RTT that has been introduced for use in any of the above environments, and is supported by all of the other active ICT that support voice and RTT in that environment.

Notes

1. In practice, new standards are introduced as an alternative codec/protocol that is supported alongside the existing common standard and used when all end-to-end components support it while technology development, combined with other reasons including societal development and cost efficiency, may make others become obsolete.

2. Where multiple technologies are used to provide voice communication, multiple interoperability mechanisms may be needed to ensure that all users are able to use RTT.

EXAMPLE: A conferencing system that supports voice communication through an internet connection might provide RTT over an internet connection using a proprietary RTT method (option c). However, regardless of whether the RTT method is proprietary or non-proprietary, if the conferencing system also offers telephony communication it will also need to support options a) or b) to ensure that RTT is supported over the telephony connection.

7.2.4 RTT responsiveness

Where ICT utilises RTT input, that RTT input shall be transmitted to the ICT network or platform on which the ICT runs within 0.5 s of the time that the smallest reliably composed unit of text entry is available to the ICT for transmission. Delays due to platform or network performance shall not be included in the 0.5 s limit.

Notes

1. For character by character input, the "smallest reliably composed unit of text entry" would be a character. For word prediction it would be a word. For some voice recognition systems - the text may not exit the recognition software until an entire word (or phrase) has been spoken. In this case, the smallest reliably composed unit of text entry available to the ICT would be the word (or phrase).
2. The 0.5 s limit allows buffering of characters for this period before transmission so character by character transmission is not required unless the characters are generated more slowly than 1 per 0.5 s.
3. A delay of 0.3 s, or less, produces a better impression of flow to the user.

7.3 Caller ID

Where ICT provides caller identification, the call Line Identification (CLI), calling party number(CPN) or origin identification (OI) information shall be available in text form as well as being programmatically determinable to ensure that call recipients identify the person calling them unless the functionality is closed.

7.4 Alternatives to access voice-based services

Where ICT provides real-time voice-based communication and also provides voice mail, auto-attendant, or interactive voice response facilities, the ICT shall offer users a means to access the information and carry out the tasks provided by the ICT without the use of hearing or speech.

Notes
1. Tasks that involve both operating the interface and perceiving the information would require that both the interface and information be accessible without use of speech or hearing.
2. Solutions capable of handling audio, RTT and video media could satisfy with the above requirement.

7.5 Video communication

7.5.1 General

This clause provides performance requirements that support users who communicate using sign language and lip-reading. For these users, good usability is achieved with a resolution of at least Quarter Video Graphics Array (QVGA, 320 x 240), a frame rate of 20 frames per second and over, with a time difference between speech audio and video that does not exceed 0.1 s.

Increasing the resolution and frame rate further improves both sign language and lip-reading, with frame rate being more important than resolution.

Time differences between audio and video (asynchronicity) can have a great impact on lip-reading - with video that lags behind audio having greater negative effect.

End-to-end latency can be a problem in video (sign) communication. Overall delay values below 0.4 s are preferred, with an increase in preference down to 0.1 s. Overall delay depends on multiple factors, including e.g. network delay and video processing. For this reason, a testable requirement on minimum values for overall delay cannot be produced.

NOTE: Recommendation ITU-T F.703 defines and gives requirements for Total Conversation that relate to the integration of audio, RTT and video in a single user connection.

7.5.2 Resolution

Where ICT that provides two-way voice communication includes real-time video functionality, the ICT:
a) shall support at least QVGA resolution; and
b) should preferably support at least VGA resolution.

7.5.3 Frame rate

Where ICT that provides two-way voice communication includes real-time video functionality, the ICT:

a) shall support a frame rate of at least 20 Frames Per Second (FPS); and
b) should preferably support a frame rate of at least 30 Frames Per Second (FPS) with or without sign language in the video stream.

7.5.4 Synchronization between audio and video

Where ICT that provides two-way voice communication includes real-time video functionality, the ICT shall ensure a maximum time difference of 0.1 s between the speech and video presented to the user.

7.5.5 Visual indicator of audio with video

Where ICT provides two-way voice communication, and includes real-time video functionality, the ICT shall provide a real-time visual indicator of audio activity.

Notes

1. The visual indicator may be a simple visual dot or LED, or other type of on/off indicator, that flickers to reflect audio activity.
2. Without this indication a person who lacks the ability to hear does not know when someone is talking.

7.5.6 Speaker identification with video (sign language) communication

Where ICT provides speaker identification for voice users, it shall provide a means for speaker identification for real- time signing and sign language users once the start of signing has been indicated.

Notes

1. The speaker ID can be in the same location as for voice users for multiparty calls.
2. This mechanism might be triggered manually by a user, or automatically where this is technically achievable.

7.6 Alternatives to access video-based services

Where ICT provides real-time video-based communication and also provides answering machine, auto attendant or interactive response facilities, the ICT shall offer users a means to access the information and carry out the tasks related to the following facilities:

a) for audible information, without the use of hearing;
b) for spoken commands, without the use of speech;
c) for visual information, without the use of vision: and
d) for signing information, without use of speech /hearing.

Note - Solutions capable of generating real-time captions or handling RTT shall comply with the above requirement

8. ICT with video capabilities

8.1 Caption processing technology

8.1.1 Captioning playback

Where ICT displays video with synchronized audio, it shall have a mode of operation to display the available captions. Where closed captions are provided as part of the content, the ICT shall allow the user to choose to display the captions.

Notes

1. Captions may contain information about timing, colour and positioning. This caption data is necessary for caption users. Timing is used for caption synchronization. Colour can be used for speaker identification. Position can be used to avoid obscuring important information.
2. If a Braille device is connected, the ICT should provide an option to display captions on the Braille device.
3. This clause refers to the ability of the player to display captions. Clauses 10.2.2.2, 11.2.2.2 and 12.2.2.2 refer to the provision of captions for the content (the video).

8.1.2 Captioning synchronization

Where ICT displays captions, the mechanism to display captions shall preserve synchronization between the audio and the corresponding captions as follows:

a) Captions in recorded material: within 0.1 s of the time stamp of the caption.
b) Live captions: within 0.1 s of the availability of the caption to the player.

8.1.3 Preservation of captioning

Where ICT transmits, converts or records video with synchronized audio, it shall preserve caption data such that it can be displayed in a manner consistent with 8.1.1 and 8.1.2.

8.1.4 Captions characteristics

Where ICT displays captions, it shall provide a way for the user to adapt the displayed characteristics of captions to their individual requirements, except where the captions are displayed as unmodifiable characters.

Notes

1. Defining the background and foreground colour of subtitles, font type, size opacity of the background box of subtitles, and the contour or border of the fonts can contribute to compliance with this requirement.
2. Subtitles that are bitmap images are examples of unmodifiable characters.

8.1.5 Spoken subtitles

Where ICT displays video with synchronized audio, it shall have a mode of operation to provide a spoken output of the available captions, except where the content of the displayed captions is not programmatically determinable.

Notes

1. Being able to manage speech output range for spoken subtitles independently from general ICT speech is preferable for most users. That is possible when the audio file with spoken subtitle is delivered in a separate audio track and mixed in the end users device.
2. Presenting the separate audio track with spoken subtitles in synchronization with the displayed subtitles/captions improves understandability of the subtitles.
3. Providing subtitles/captions as separate text-streams, facilitates converting the respective texts into audio.
4. Subtitles that are bitmap images are examples where the content of the displayed captions will not be programmatically determinable.

8.2 Audio description technology

8.2.1 Audio description playback

Where ICT displays video with synchronized audio, it shall provide a mechanism to select and play available audio description to the default audio channel.

Where video technologies do not have explicit and separate mechanisms for audio description, an ICT is deemed to comply with this requirement if the ICT enables the user to select and play several audio tracks.

Notes

1. In such cases, the video content can include the audio description as one of the available audio tracks.
2. Audio descriptions in digital media sometimes include information to allow descriptions that are longer than the gaps between dialogue. Support in digital media players for this "extended audio description" feature is useful, especially for digital media that is viewed personally.

8.2.2 Audio description synchronization

Where ICT has a mechanism to play audio description, it shall preserve the synchronization between the audio/visual content and the corresponding audio description.

8.2.3 Preservation of audio description

Where ICT transmits, converts, or records video with synchronized audio, it shall preserve audio description data such that it can be played in a manner consistent with 8.2.1 and 8.2.2.

8.2.4 User controls for captions and audio description

Where ICT primarily displays materials containing video with associated audio content, user controls to activate subtitling and audio description shall be provided to the user at the same level of interaction (i.e. the number of steps to complete the task) as the primary media controls.

Notes

1. Primary media controls are the set of controls that the user most commonly uses to control media.
2. Products that have a general hardware volume control, such as a telephone, or a laptop which can be configured to display video through software but which is not its primary purpose, would not need dedicated hardware controls for captions and descriptions; however software controls, or hardware controls mapped through software, would need to be at the same level of interaction.
3. It is recommended for ICT to include additional controls enabling the user to select whether captions and audio description are turned on or off by default.

9. Hardware

9.1 General

9.1.1 Generic requirements

The generic requirements of clause 6 also apply to ICT that is hardware.

9.1.2 Standard connections

Where an ICT provides user input or output device connection points, the ICT shall provide at least one input and/or output connection that conforms to an industry standard non-proprietary format, directly or through the use of commercially available adapters.

Notes:

1. The intent of this requirement is to ensure compatibility with assistive technologies by requiring the use of standard connections on ICT for example use a 3.5 mm audio jack.
2. The word connection applies to both physical and wireless connections.
3. Current examples of industry standard non-proprietary formats are USB and Bluetooth.

9.1.3 Colour

Where the ICT has hardware aspects that use colour, colour shall not be used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

9.2 Hardware products with speech output

9.2.1 Speech volume gain

9.2.1.1 Speech volume range

Where ICT hardware has speech output, it shall provide a means to adjust the speech output volume level over a range of at least 18 dBA but should not exceed 85 dBA.

Note - Fixed-line handsets and headsets fulfilling the requirements of ANSI/TIA-4965 are deemed to comply with this requirement.

9.2.1.2 Incremental volume control

Where ICT hardware has speech output and its volume control is incremental, it shall provide at least one intermediate step of 12 dBA gain above the lowest volume setting.

9.2.2 Magnetic coupling

9.2.2.1 Fixed-line devices

Where ICT hardware is a fixed-line communication device with speech output and which is normally held to the ear, it shall provide a means of magnetic coupling which meets the requirements of ETSI ES 200 381-1 and shall carry the "T" symbol specified in ETSI ETS 300 381.

Notes

1. ICT fulfilling the requirements of TIA-1083-A is deemed to comply with the requirements of this clause.
2. Magnetic coupling is also known as inductive coupling for T-coil.

9.2.2.2 Wireless communication devices

Where ICT hardware is a wireless communication device with speech output which is normally held to the ear, it shall provide a means of magnetic coupling to hearing technologies which meets the requirements of ETSI ES 200 381-2.

Note - ICT fulfilling the requirements of ANSI/IEEE C63.19 is deemed to comply with the requirements of this clause.

9.3 Stationary ICT

9.3.1 General

This clause defines the dimensions for accessing stationary ICT that can be placed in a built environment, but does not define the dimensions of the built environment in general.

The scope includes stationary ICT, of which floors and circulation spaces are "an integral part", and where there are external reach ranges relevant for operating the stationary ICT.

Clauses 9.3.3 to 9.3.4 specify mandatory limits for the maximum and minimum height of operable parts and displays. Based on dimensions shown in Figure 9.1 of ISO 21542, it is recommended that the possible height range is reduced to:

a) minimum and maximum heights of operable parts: 800 mm and 1100 mm respectively, and
b) minimum and maximum heights of displays: 1200 mm and 1400 mm respectively.

9.3.2 Forward or Side Reach

Stationary ICT shall comply with either clause 9.3.3 or clause 9.3.4.

Notes
1. This does not preclude conforming to both clauses.
2. Physical access to stationary ICT is dependent on the dimensions of both the ICT and the environment in which it is installed and operated. Clause 9.3 does not apply to the accessibility of the physical environment external to the ICT.

9.3.3 Forward reach

9.3.3.1 Unobstructed high forward reach

Where no part of the stationary ICT obstructs the forward reach, at least one of each type of operable part shall not be located higher than 1 220 mm above the floor of the access space. (See Figure 9.1).

9.3.3.2 Unobstructed low forward reach

Where no part of the stationary ICT obstructs the forward reach, at least one of each type of operable part shall not be located lower than 380 mm above the floor of the access space. (See Figure 9.1).

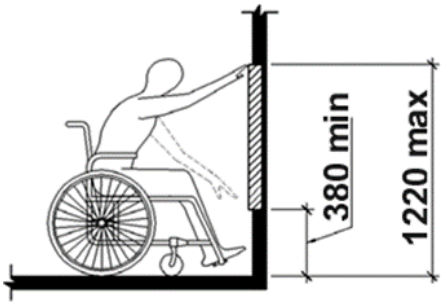

Figure 9.1 - Unobstructed forward reach

9.3.3.3 Obstructed forward reach

9.3.3.3.1 Clear space

Where an obstruction is an integral part of the stationary ICT and hinders the access to any type of operable part, the ICT shall provide a clear space which extends beneath the obstructing element for a distance not less than the required reach depth over the obstruction.

Note - Ensuring that there will be unhindered "access to any type of operable part" guarantees that a user will be able to access at least one of each type of operable part.

9.3.3.3.2 Obstructed (< 510 mm) forward reach

Where the stationary ICT has an obstruction which is an integral part of the ICT and which is less than 510 mm the forward reach to at least one of each type of operable part shall not be higher than 1 220 mm above the floor contact of the ICT. (See Figure (9.2).

9.3.3.3.3 Obstructed (< 635 mm) forward reach

Where the stationary ICT has an obstruction which is an integral part of the ICT and which is not less than 510 mm but is less than 635 mm maximum, the forward reach to at least one of each type of operable part shall be no higher than 1 120 mm above the floor contact of the ICT. (See Figure (9.3).

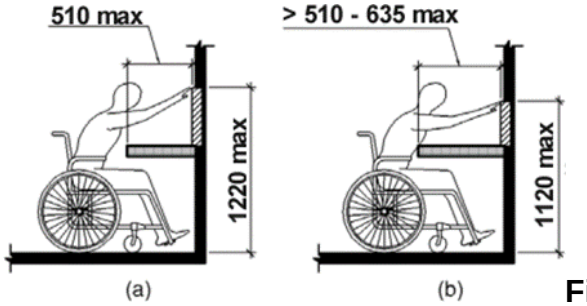

Figure (9.2) and (9.3) - Obstructed forward reach

9.3.4 Visibility

Where stationary ICT provides one or more display screens, at least one of each type of display screen shall be positioned such that the information on the screen is legible from a point located 1 015 mm above the centre of the floor of the operating area).

NOTE:

The intent of this requirement is that the information on the screen can be read by users with normal vision and appropriate language skills, when seated in a wheelchair.

9.3.5 Installation instructions

Installation instructions shall be made available for all stationary ICT. These instructions shall give guidance on how to install the ICT in a manner that takes into account applicable requirements for accessibility of the built environment as they apply to the installation of the ICT. Where there are no such requirements the instructions should require that the dimensions of the installed ICT conform to clauses 9.3.2 to 9.3.5 of the present document.

9.4 Mechanically operable parts

9.4.1 Numeric keys

Where provided, physical numeric keys arranged in a rectangular keypad layout shall have the number five key tactilely distinct from the other keys of the keypad.

Note: Recommendation ITU-T E.161 [i.20] describes the 12-key telephone keypad layout and provides further details of the form of tactile markers.

10. Web

10.1 General

Requirements in clause 10 apply to web pages (as defined in clause 4) including:

a) Conformance with WCAG 2.0 Level AA is equivalent to conforming with clauses 9.2.1, 9.2.2, 9.2.3.1 to 9.2.3.3, 9.2.4.1 to 9.2.4.5, 9.3.1.1, 9.3.1.2,9.3.2, 9.3.3, 9.3.4, 9.4, 9.5.1.1, 9.5.1.2 and the conformance requirements of clause 10.7 of this standard.

b) Conformance with WCAG 2.1 Level AA is equivalent to conforming with all of clauses 9.2 to 9.5 and the conformance requirements of clause 10.7 of this standard.

c) Requirements for non-web documents and non-web software are given in clauses 11 and 12 respectively.

Notes

1. When evaluating websites they are evaluated as individual web pages. Web applications, including mobile web applications, are covered under the definition of web page which is quite broad and covers all web content types.
2. WCAG 2.0 is identical to ISO/IEC 40500:2012

The requirements in clauses 10.2 to 10.5 are written using the concept of complying with success criteria (defined in clause 4). A web page satisfies a WCAG success criterion when the success criterion does not evaluate to false when applied to the web page. This implies that if the success criterion puts conditions on a specific feature and that specific feature does not occur in the web page, then the web page satisfies the success criterion.

3. For example, a web page that does not contain pre-recorded audio content in synchronized media will automatically comply with WCAG success criterion 1.2.2 (captions - pre-recorded) and, in consequence, will also conform to 10.2.2.2.

In addition to Level AA success criteria, the Web Content Accessibility Guidelines also include success criteria for Level AAA. These are listed in 10.6 of this standard. Web authors and procurement accessibility specialists should consider whether any of the WCAG Level AAA success criteria offer suggestions that may be applicable and relevant to their project, as well as potentially beneficial to some users.

4. The W3C states that "It is not recommended that Level AAA conformance be required as a general policy for entire sites because it is not possible to comply with all Level AAA Success Criteria for some content".

10.2 Perceivable

10.2.1 Text alternatives

10.2.1.1 Non-text content

Where ICT is a web page, it shall comply with WCAG 2.1 Success Criterion 1.1.1, Non-text content.

10.2.2 Time-based media

10.2.2.1 Audio-only and video-only (pre-recorded)

Where ICT is a web page, it shall comply with WCAG 2.1 Success Criterion, 1.2.1, Audio-only and Video-only (Pre-recorded).

10.2.2.2 Captions (pre-recorded)

Where ICT is a web page, Captions shall be provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such, as per the WCAG 2.1, Success Criterion, 1.2.2,

10.2.2.3 Audio description or media alternative (pre-recorded)

Where ICT is a web page, An alternative for time-based media or audio description of the prerecorded video content shall be provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such, as per the WCAG 2.1, Success Criterion 1.2.3.

10.2.2.4 Captions (live)

Captions shall be provided for all live audio content in synchronized media as per the WCAG 2.1, Success Criterion 1.2.4.

10.2.2.5 Audio description (pre-recorded)

Where ICT is a web page, Audio description shall be provided for all prerecorded video content in synchronized media as per the WCAG 2.1, Success Criterion 1.2.5.

10.3 Adaptable

10.3.1.1 Info and relationships

Where ICT is a web page, it shall ensure that Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text as per the WCAG 2.1.

10.3.1.2 Meaningful sequence

Where ICT is a web page, and When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined as per the WCAG 2.1.

10.3.1.3 Sensory characteristics

Where ICT is a web page, Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, colour, size, visual location, orientation, or sound as per the WCAG 2.1, Success Criterion 1.3.3

10.3.1.4 Orientation

Where ICT is a web page, Content shall not restrict its view and operation to a single display orientation, such as portrait or landscape, unless a specific display orientation is essential as per the WCAG 2.1 Success Criterion 1.3.4.

10.3.1.5 Identify input purpose

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 1.3.5 Identify Input Purpose.

10.4.1 Distinguishable

10.4.1.1 Use of colour

Where ICT is a web page, Colour shall not be used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element as per WCAG 2.1 Success Criterion 1.4.1.

10.4.1.2 Audio control

Where ICT is a web page, If any audio on a Web page plays automatically for more than 3 seconds, there shall be a mechanism available to pause or stop the audio, or a mechanism available to control audio volume independently from the overall system volume level as per WCAG 2.1 Success Criterion 1.4.2.

10.4.1.3 Contrast (minimum)

Where ICT is a web page, The visual presentation of text and images of text shall have a contrast ratio of at least 4.5:1 as per the WCAG 2.1, except for the following;

1. Large-scale text and images of large-scale text shall have a contrast ratio of at least 3:1;
2. Incidental - Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.

3. Logotypes - Text that is part of a logo or brand name has no contrast requirement.

10.4.1.4 Resize text

Where ICT is a web page, Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality as per the WCAG 2.1 Success Criterion 1.4.4.

10.4.1.5 Images of text

Where ICT is a web page and the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following:

1. Customizable: The image of text can be visually customized to the user's requirements;
2. Essential: A particular presentation of text is essential to the information being conveyed.

10.4.1.6 Reflow

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 1.4.10 Reflow.

10.4.1.7 Non-text contrast

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 1.4.11 Non-text Contrast.

10.4.1.8 Text spacing

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 1.4.12 Text spacing.

10.4.1.9 Content on hover or focus

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 1.4.13 Content on Hover or Focus.

10.5 Operable

10.5.1 Keyboard accessible

10.5.1.1 Keyboard

Where ICT is a web page, it shall ensure that all functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints as per the WCAG 2.1.

10.5.1.2 No keyboard trap

Where ICT is a web page, If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away as per the WCAG 2.1.

10.5.1.3 Character key shortcuts

Where ICT is a web page, and a keyboard shortcut is implemented in content using only letter (including upper- and lower-case letters), punctuation, number, or symbol characters, then at least one of the following is true:

1. Turn off - A mechanism is available to turn the shortcut off;
2. Remap- A mechanism is available to remap the shortcut to include one or more non-printable keyboard keys (e.g., Ctrl, Alt);
3. Active only on focus-The keyboard shortcut for a user interface component is only active when that component has focusnas per WCAG 2.1.

10.5.2 Enough time

10.5.2.1 Timing adjustable

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 2.2.1 Timing Adjustable.

10.5.2.2 Pause, stop, hide

Where ICT is a web page, it shall satisfy WCAG 2.1 Success Criterion 2.2.2 Pause, Stop, Hide.

10.5.3 Seizures and physical reactions

10.5.3.1 Three flashes or below threshold

Where ICT is a web page, Web pages should not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds as per the WCAG 2.1 Success Criterion 2.3.1.

10.5.4 Navigable

10.5.4.1 Bypass blocks

Where ICT is a web page, it shall provide a mechanism to bypass blocks of content that are repeated on multiple Web pages.

10.5.4.2 Page titled

Where ICT is a web page, it shall provide titles that describe topic or purpose.

10.5.4.3 Focus Order

Where ICT is a web page and can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability as per WCAG 2.1 Success Criterion 2.4.3.

10.5.4.4 Focus visible

Where ICT is a web page, Any keyboard operable user interface shall have a mode of operation where the keyboard focus indicator is visible.

10.5.4.5 purpose (in context)

Where ICT is a web page, The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general.

10.5.4.6 Headings and labels

Where ICT is a web page, it shall satisfy WCAG 2.1 where the Headings and labels describe topic or purpose

11 Non Web Documents

11.0 General

Requirements in clause 11 apply to:

a) documents that are not web pages;

b) documents that are not embedded in web pages; and

c) documents that are provided with web pages but are neither embedded nor rendered together with the webpage from which they are provided (i.e. the present clause applies to downloadable documents).

Clause 11 provides requirements for documents that are in web pages or that are embedded in web pages and that are used in the rendering or that are intended to be rendered together with the web page in which they are embedded.

Notes

1. Some examples of documents are letters, spreadsheets, emails, books, pictures, presentations, and movies that have an associated user agent such as a document reader, editor or media player.

2. A single document may be composed of multiple files such as the video content and closed caption text.This fact is not usually apparent to the end-user consuming the document/content.
3. Documents require a user agent in order for the content to be presented to users. The requirements for user agents can be found in clause 12.
4. The requirements for content that is part of software, can be found in clause 12.
5. The success criteria set out in clause 11 are intended to harmonize with the Working Group Note [i.26] produced by the WCAG2ICT Task Force.
6. Requirements in clause 11 also apply to documents that are protected using mechanisms such as digital signatures, encryption, password protection, and watermarks when they are presented to the user.
7. It is best practice to provide meta data on the accessibility of the document within or separate to the document using WebSchemas/Accessibility 2.0 [i.38].

11.1 Perceivable

11.1.1Text alternatives

11.1.1.1 Non-text content

Where ICT is a non-web document, it shall satisfy the WCAG 2.1 Success Criterion 1.1.1 Non-text Content.

Note:

CAPTCHAs do not currently appear outside of the Web. However, if they do appear, this guidance is accurate.

11.1.2 Time-based media

10.1.2.1 Audio-only and video-only (pre-recorded)

Where ICT is a non-web document, it shall satisfy WCAG 2.1 Success Criterion 1.2.1 Audio-only and Video-only (Prerecorded).

Note

The alternative can be provided directly in the document - or provided in an alternate version that meets the success criterion.

11.1.2.1 Captions (pre-recorded)

Where ICT is a non-web document, Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such.

11.1.2.2 Audio Description or Media Alternative (Pre-Recorded)

Where ICT is a non-web document, An alternative for time-based media or audio description of the prerecorded video content should be provided for synchronized

media, except when the media is a media alternative for text and is clearly labeled as such.

Notes

1. The WCAG 2.1 definition of “audio description” says that “audio description” is Also called “video description” and “descriptive narration”.
2. Secondary or alternate audio tracks are commonly used for this purpose.

11.1.2.3 Captions (live)

Where ICT is a non-web document, Captions are provided for all live audio content in synchronized media.

11.1.3 Adaptable

11.1.3.1 Info and relationships

Where ICT is a non-web document, Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text.

Note

Where documents contain non-standard structure types (roles), it is best practice to map them to a standard structure type as a fall-back solution for the reader.

11.1.3.2 Meaningful sequence

Where ICT is a non-web document and the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined.

11.1.3.3 Sensory characteristics

Where ICT is a non-web document, Instructions provided for understanding and operating content should not rely solely on sensory characteristics of components such as shape, colour, size, visual location, orientation, or sound.

11.1.3.4 Orientation

Where ICT is a non-web document, Content should not restrict its view and operation to a single display orientation, such as portrait or landscape, unless a specific display orientation is essential.

11.1.3.5 Identify input purpose

Where ICT is a non-web document, it shall satisfy the WCAG 2.1 Success Criterion 1.3.5 Identify Input Purpose.

11.1.4 Distinguishable

11.1.4.1 Use of colour

Where ICT is a non-web document, Colour should not be used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

11.1.4.2 Audio control

Where ICT is a non-web document, it shall satisfy the document success criterion which state that, the Audio control If any audio in a document plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level.

11.1.4.3 Contrast (minimum)

Where ICT is a non-web document, it shall satisfy the WCAG 2.1 Success Criterion 1.4.3 Contrast (Minimum).

11.1.4.4 Resize text

Where ICT is a non-web document, Except for captions and images of text, text can be resized without assistive technology up to 200 % without loss of content or functionality.

Notes

1. Content for which there are software players, viewers or editors with a 200 % zoom feature would automatically meet this success criterion when used with such players, unless the content will not work with zoom.
2. This success criterion is about the ability to allow users to enlarge the text on screen at least up to 200% without needing to use assistive technologies. This means that the application provides some means for enlarging the text 200% (zoom or otherwise) without loss of content or functionality or that the application works with the platform features that meet this requirement.
3. It is best practice to use only fonts that allow for scaling without loss of quality (e.g. pixelized presentation). This applies in particular to embedded fonts.

11.1.4.5 Images of text

Where ICT is a non-web document, it shall satisfy the WCAG 2.1 Success Criterion 1.4.5 Images of Text.

11.1.4.6 Reflow

Where ICT is a non-web document, it shall satisfy the document success criterion that state that the reflow content can be presented without loss of information or functionality, and without requiring scrolling in two dimensions for:

a) Vertical scrolling content at a width equivalent to 320 CSS pixels.
b) Horizontal scrolling content at a height equivalent to 256 CSS pixels. Except for parts of the content which require two-dimensional layout for usage or meaning.

Notes

1. 320 CSS pixels is equivalent to a starting viewport width of 1280 CSS pixels wide at 400 % zoom. For documents which are designed to scroll horizontally (e.g. with vertical text), the 256 CSS pixels is equivalent to a starting viewport height of 1024 pixels at 400 % zoom.
2. Examples of content which require two-dimensional layout are images, maps, diagrams, video, games, presentations, data tables, and interfaces where it is necessary to keep toolbars in view while manipulating content.
3. This success criterion is identical to the WCAG 2.1 Success Criterion 1.4.10 Reflow replacing the original WCAG 2.1 notes with notes 1 and 2, above.

11.1.4.7 Non-text contrast

Where ICT is a non-web document, The visual presentation it shall satisfy WCAG 2.1 Success Criterion 1.4.11 Non-text Contrast.

11.1.4.8 Text spacing

Where ICT is a non-web document that does not have a fixed size content layout area that is essential to the information being conveyed, it shall satisfy WCAG 2.1 Success Criterion 1.4.12 Text spacing.

11.1.4.9 Content on hover or focus

Where ICT is a non-web document, it shall satisfy WCAG 2.1 Success Criterion 1.4.13 Content on Hover or Focus.

11.2 Operable

11.2.1 Keyboard accessible

11.2.1.1 Keyboard

Where ICT is a non-web document, it shall satisfy the WCAG 2.1 Success Criterion 2.1.1 Keyboard.

11.2.1.2 keyboard trap

Where ICT is a non-web document, it shall satisfy the document success criterion for No keyboard trap which states that If keyboard focus can be moved to a component of the document using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away.

Note

Standard exit methods may vary by platform. For example, on many desktop platforms, the Escape key is a standard method for exiting.

11.2.1.3 Character key shortcuts

Where ICT is a non-web document, it shall satisfy WCAG 2.1 Success Criterion 2.1.4 Character Key Shortcuts.

11.2.2 Enough time

11.2.2.1 Timing adjustable

Where ICT is a non-web document, it shall satisfy the document success criterion for Timing adjustable where for each time limit that is set by the document, at least one of the following is true:

1. Turn off: The user is allowed to turn off the time limit before encountering it; or
2. Adjust: The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or
3. Extend: The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or
4. Real-time Exception: The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or
5. Essential Exception: The time limit is essential and extending it would invalidate the activity; or
6. 20 Hour Exception: The time limit is longer than 20 hours.

Notes

This success criterion helps ensure that users can complete tasks without unexpected changes in content or context that are a result of a time limit. This success criterion should be considered in conjunction with WCAG 2.1 Success Criterion 3.2.1, which puts limits on changes of content or context as a result of user action.

11.2.2.2 Pause, stop, hide

Where ICT is a non-web document, it shall satisfy the document success criterion for Pause, stop, hide which state that for moving, blinking, scrolling, or auto-updating information, all of the following are true:

1. Moving, blinking, scrolling: For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and
2. Auto-updating: For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential.

Notes

1. For requirements related to flickering or flashing content, refer to WCAG 2.1 Guideline 2.3.
2. Since any part of a document that does not meet this success criterion can interfere with a user's ability to use the whole document, it is necessary for all content in the document (whether it is used to meet other success criteria or not) to meet this success criterion.
3. Content that is updated periodically by software or that is streamed to the user agent is not required to preserve or present information that is generated or received between the initiation of the pause and resuming presentation, as this may not be technically possible, and in many situations could be misleading to do so.
4. An animation that occurs as part of a preload phase or similar situation can be considered essential if interaction cannot occur during that phase for all users and if not indicating progress could confuse users or cause them to think that content was frozen or broken.
5. This success criterion is identical to the WCAG 2.1 Success Criterion 2.2.2 Pause, Stop, Hide replacing "page" and "Web page" with "document", removing "See Conformance Requirement 5: Non-Interference" in note 2 of the success criterion, with the words "WCAG 2.1" added before the word "Guideline" in note 1 above and with note 2 above re-drafted to avoid the use of the word "must".

11.2.3 Seizures and physical reactions

11.2.3.1 Three flashes or below threshold

Where ICT is a non-web document, it shall satisfy the document success criterion for three flashes or below threshold where the documents do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds.

Notes

Since any part of a document that does not meet this success criterion can interfere with a user's ability to use the whole document, it is necessary for all content in the document (whether it is used to meet other success criteria or not) to meet this success criterion.

11.2.4 Navigable

10.2.4.1 Document titled

Where ICT is a non-web document, it shall satisfy the document success criterion where the documents have titles that describe topic or purpose.

Notes
The name of a document (e.g. document, media file) is a sufficient title if it describes the topic or purpose.

11.2.4.1 Focus Order

Where ICT is a non-web document, it shall satisfy the document success criterion for Focus order that states that If a document can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.

11.2.4.2 Link purpose (in context)

Where ICT is a non-web document, The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general.

11.2.4.3 Headings and labels

Headings and labels describe topic or purpose.

11.2.4.4 Focus visible

Where ICT is a non-web document, Any keyboard operable user interface should have mode of operation where the keyboard focus indicator is visible.

11.2.5 Input modalities

11.2.5.1 Pointer gestures

Where ICT is a non-web document, it shall satisfy the success document success criterion for Pointer gestures which states that All functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture, unless a multipoint or path-based gesture is essential.
Notes
1: This requirement applies to documents that interpret pointer actions (i.e. this does not apply to actions that are required to operate the user agent or assistive technology).
2: This success criterion is identical to the WCAG 2.1 Success Criterion 2.5.1 Pointer Gestures replacing the original WCAG 2.1 note with note 1 above.

11.2.5.2 Pointer cancellation

Where ICT is a non-web document, it shall satisfy the document success criterion for Pointer cancellation which states that For functionality that can be operated using a single pointer, at least one of the following is true:
a) No Down-Event: The down-event of the pointer is not used to execute any part of the function;

b) Abort or Undo: Completion of the function is on the up-event, and a mechanism is available to abort the function before completion or to undo the function after completion;
c) Up Reversal: The up-event reverses any outcome of the preceding down-event;
d) Essential: Completing the function on the down-event is essential.

Notes
1: Functions that emulate a keyboard or numeric keypad key press are considered essential.
2: This requirement applies to a document that interprets pointer actions (i.e. this does not apply to actions that are required to operate the user agent or assistive technology).
3: This success criterion is identical to the WCAG 2.1 Success Criterion 2.5.2 Pointer Cancellation replacing the original WCAG 2.1 note with notes 1 and 2 above.

11.2.5.3 Label in name

Where ICT is a non-web document, For user interface components with labels that include text or images of text, the name contains the text that is presented visually.

11.2.5.4 Motion actuation

Where ICT is a non-web document, it shall satisfy WCAG 2.1 Success Criterion 2.5.4 Motion Actuation.

11.3 Understandable

11.3.1 Readable

11.3.1.1 Language of document

Where ICT is a non-web document, it shall satisfy the document success criterion for Language of document which states that the default human language of each document can be programmatically determined.

11.3.1.2 Language of parts

Where ICT is a non-web document, it shall satisfy the document success criterion for Language of parts which states that the human language of each passage or phrase in the document can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text.

Notes
1: There are some document technologies where there is no assistive technology supported method for marking the language for the different passages or phrases in the document, and it would not be possible to meet this success criterion with those technologies.
2: Inheritance is one common method. For example a document provides the language that it is using and it can be assumed that all of the text or user interface

elements within that document will be using the same language unless it is indicated.

3: This success criterion is identical to the WCAG 2.1 Success Criterion 3.1.2 Language of Parts replacing "content" with "document" and with the addition of notes 1 and 2 above.

11.3.2 Predictable

11.3.2.1 On focus

Where ICT is a non-web document and any user interface component receives focus, it should not initiate a change of context.

Note

Some compound documents and their user agents are designed to provide significantly different viewing and editing functionality depending upon what portion of the compound document is being interacted with (e.g. a presentation that contains an embedded spreadsheet, where the menus and toolbars of the user agent change depending upon whether the user is interacting with the presentation content, or the embedded spreadsheet content). If the user uses a mechanism other than putting focus on that portion of the compound document with which they mean to interact (e.g. by a menu choice or special keyboard gesture), any resulting change of context would not be subject to this success criterion because it was not caused by a change of focus.

11.3.2.2 On input

Where ICT is a non-web document, Changing the setting of any user interface component should not automatically cause a change of context unless the user has been advised of the behavior before using the component.

Note:

The related web page requirement "Consistent navigation" does not apply to single documents, but to a specific definition of "sets of documents" that are rare.

11.3.3 Input assistance

11.3.3.1 Error identification

Where ICT is a non-web document, and an input error is automatically detected, the item that is in error is identified and the error is described to the user in text.

11.3.3.2 Labels or instructions

Where ICT is a non-web document, Labels or instructions should be provided when content requires user input.

11.3.3.3 Error suggestion

Where ICT is a non-web document, If an input error is automatically detected and suggestions for correction are known, then the suggestions should be provided to the user, unless it would jeopardize the security or purpose of the content.

11.3.3.4 Error prevention (legal, financial, data)

Where ICT is a non-web document, it shall satisfy the document success criterion for Error prevention (legal, financial, data) which states that for documents that cause legal commitments or financial transactions for the user to occur, that modify or delete user-controllable data in data storage systems, or that submit user test responses, at least one of the following is true:

1) Reversible: Submissions are reversible.
2) Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.
3) Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.

11.4 Robust

11.4.1 Compatible

11.4.1.1 Parsing

Where ICT is a non-web document, it shall satisfy the document success criterion: Parsing which states that for documents that use markup languages, in such a way that the markup is separately exposed and available to assistive technologies and accessibility features of software or to a user-selectable user agent, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features.

Notes

1. Start and end tags that are missing a critical character in their formation, such as a closing angle bracket or a mismatched attribute value quotation mark are not complete.
2. Markup is not always available to assistive technology or to user selectable user agents such as browsers. In such cases, conformance to this [requirement] would have no impact on accessibility as it can for web content where it is exposed.
3. Examples of markup that is separately exposed and available to assistive technologies and to user agents include but are not limited to: documents encoded in HTML, ODF, and OOXML. In these examples, the markup can be parsed entirely in two ways: (a) by assistive technologies which may directly open the document, (b) by assistive technologies using DOM APIs of user agents for these document formats.

11.4.1.2 Name, role, value

Where ICT is a non-web document, it shall satisfy the document success criterion for Name, role, value that states that for all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.

Notes

1. This success criterion is primarily for software developers who develop or use custom user interface components. Standard user interface components on most accessibility-supported platforms already meet this success criterion when used according to specification.
2. For document formats that support interoperability with assistive technology, standard user interface components often meet this success criterion when used according to the general design and accessibility guidance for the document format.

11.4.1.3 Status messages

Where ICT is a non-web document, In content implemented using markup languages, status messages can be programmatically determined through role or properties such that they can be presented to the user by assistive technologies without receiving focus.

11.4.1.4 Caption positioning

Where ICT is a non-web document that contains synchronized media with captions, the captions should not obscure relevant information in the synchronized media.

11.4.1.5 Audio description timing

Where ICT is a non-web document that contains synchronized media with audio description, the audio description should not interfere with relevant audio information in the synchronized media.

12. Software

12.0 General (informative)

This clause provides requirements for:

a) platform software;
b) software that provides a user interface including content that is in the software;
c) authoring tools;
d) software that operates as assistive technology;
e) mobile applications

Notes

1. User agents are examples of software that provide a user interface. They retrieve, render and facilitate end user interaction with authored content. User agents play a necessary role in the accessibility of authored content rendered in the user interface. UAAG 2.0 [i.33] provides additional advice for those who are creating user agents and want to increase functionality when rendering authored content in an accessible way.
2. The requirements for Web content, including software that is Web content, can be found in clause 10.
3. The requirements for documents, that may be presented by user agents, can be found in clause 11.
4. Although the accessibility of command line interfaces is not dealt with in the present document, accessibility may be achieved by context specific requirements, some of which may be found in clauses 6 or 12.

   Requirements in clauses 12.1 to 12.5 apply to software:
   a) that is not a web page;
   b) not embedded in web pages nor used in the rendering or functioning of the page.

   Clause 10 provides requirements for software that is in web pages or that is embedded in web pages and that is used in the rendering or that is intended to be rendered together with the web page in which it is embedded.

   Some requirements in clauses 12.1 to 12.5 have different versions for open or closed functionality. In those cases, the corresponding clause will be divided into two subclauses.

   The success criteria set out in clauses 12.1 to 12.5 are intended to harmonize with the W3C Working Group Note [i.26] produced by the WCAG2ICT Task Force.

5. Software that provides a user interface includes its own content. Some examples of content in software include: the controls and text displayed in a menu bar of a graphical user interface application, images that appear in a toolbar, prompts spoken in an auditory user interface, other user interaction controls, and other text, graphics or material that is not loaded from outside the software.

12.1 Perceivable

12.1.1 Text alternatives

12.1.1.1 Non-text content

12.1.1.1.1 Non-text content (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the requirement as in clause 10.1.2.1 of the document.

Note
CAPTCHAs do not currently appear outside of the Web. However, if they do appear, this guidance is accurate.

12.1.1.1.2 Non-text content (closed functionality)
Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.6 (Speech output for non-text content).

12.1.2 Time-based media
12.1.2.1 Audio-only and video-only (pre-recorded)
12.1.2.1.1 Audio-only and video-only (pre-recorded - open functionality)
Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading and where pre-recorded auditory information is not needed to enable the use of closed functions of ICT, it shall satisfy the requirement 10.1.3.1 of this document.

Note
The alternative can be provided directly in the software - or provided in an alternate version that meets the success criterion.

12.1.2.1.2 Audio-only and video-only (pre-recorded - closed functionality)

12.1.2.1.2.1 Pre-recorded audio-only (closed functionality)
Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading and where pre-recorded auditory information is needed to enable the use of closed functions of ICT, the functionality of software that provides a user interface shall meet requirement 6.1.5 of this document

12.1.2.1.2.2 Pre-recorded video-only (closed functionality)
Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.7 of this document .

12.1.2.1.3 Captions (pre-recorded or live)
Where ICT is non-web software that provides a user interface, it shall satisfy the requirements in clause 10.1.3.2 and 10.1.3.4 of this document.

12.1.2.1.4 Audio description or media alternative (pre-recorded)

12.1.2.1.4.1 Audio description or media alternative (pre-recorded - open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the requirement 10.1.3.3 of this document.

Notes

Secondary or alternate audio tracks are commonly used for this purpose.

12.1.2.1.4.2 Audio description or media alternative (pre-recorded - closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.7 of this document

12.1.3 Adaptable

12.1.3.1 Info and relationships

12.1.3.1.1 Info and relationships (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the requirement 10.1.4.1 of this document.

Note:

In software, programmatic determinability is best achieved through the use of accessibility services provided by platform software to enable interoperability between software and assistive technologies and accessibility features of software. (see clause 12.5 Interoperability with assistive technology).

12.1.3.1.2 Info and relationships (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading and where information is displayed on the screen, the ICT should provide auditory information that allows the user to correlate the audio with the information displayed on the screen.

Notes :

1. Many people who are legally blind still have visual ability, and use aspects of the visual display even if it cannot be fully comprehended. An audio alternative that is both complete and complementary includes all visual information such as focus or highlighting, so that the audio can be correlated with information that is visible on the screen at any point in time.

2. Examples of auditory information that allows the user to correlate the audio with the information displayed on the screen include structure and relationships conveyed through presentation.

12.1.3.2 Meaningful sequence

12.1.3.2.1 Meaningful sequence (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the requirement 10.1.4.2 of this document.

12.1.3.2.2 Meaningful sequence (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading and where information is displayed on the screen, the ICT should provide auditory information that allows the user to correlate the audio with the information displayed on the screen.

Note:

1. Many people who are legally blind still have visual ability, and use aspects of the visual display even if it cannot be fully comprehended. An audio alternative that is both complete and complementary includes all visual information such as focus or highlighting, so that the audio can be correlated with information that is visible on the screen at any point in time.
2. Examples of auditory information that allows the user to correlate the audio with the information displayed on the screen include structure and relationships conveyed through presentation.

12.1.3.3 Sensory characteristics and Orientation

Where ICT is non-web software that provides a user interface, it shall satisfy the requirement 10.1.4.3 and 10.1.4.4 of this document.

12.1.3.4 Identify input purpose

12.1.3.4.1 Identify input purpose (open functionality)

Where ICT is non-web software that provides a user interface and supports access to assistive technologies for screen reading, it shall satisfy the requirement 10.1.4.5 of this document.

12.1.3.4.2 Identify input purpose (closed functionality)

Where ICT is non-web software that provides a user interface and is closed to assistive technologies, in at least one mode of operation the ICT shall present to the user, in an audio form, the purpose of each input field collecting information about the user when the input field serves a purpose identified in the WCAG 2.1 Input Purposes for User Interface Components section.

12.1.4 Distinguishable

12.1.4.1 Use of colour, Audio Control, Contrast (minimum) and Resize (open functionality)

Where ICT is non-web software that provides a user interface, it shall satisfy the requirement identical to clauses 11.1.4.2, 11.1.4.3 and 11.1.4.4 of this document, replacing document with the software.

12.1.4.2 Resize text (closed functionality)

Where ICT is non-web software that provides a user interface which is not able to access the enlargement features of platform or assistive technology, it shall meet requirement 6.1.4 of this document.

Note :
Because the text rendering support in a closed environment may be more limited than the support found in user agents for the Web, meeting the present clause in a closed environment may place a much heavier burden on the content author.

12.1.4.3 Images of text

12.1.4.3.1 Images of text (open functionality) and Reflow

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the requirements 11.1.4.5 and 11.1.4.6 replacing the word document with software in this case.

12.1.4.3.2 Images of text (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.6 (Speech output for non-text content).

12.1.4.4 Non-text contrast, Text spacing and Content on hover or focus

Where ICT is non-web software that provides a user interface, it shall satisfy requirements provided in 11.1.4.7, 11.1.4.8 and 11.1.4.9 replacing document with software in this case.

12.2 Operable

12.2.1 Keyboard accessible

12.2.1.1 Keyboard

12.2.1.1.1 Keyboard (open functionality), No keyboard trap, Character key shortcuts(open functionality)

Where ICT is non-web software that provides a user interface and that supports access to keyboards or a keyboard interface, it shall satisfy the similar requirement as in clause 11.2.1 replacing the word document with software.

Note :
This does not imply that software is required to directly support a keyboard or "keyboard interface". Nor does it imply that software is required to provide a soft keyboard. Underlying platform software may provide device independent input services to applications that enable operation via a keyboard. Software that supports operation via such platform device independent services would be operable by a keyboard and would comply.

12.2.1.1.2 Keyboard (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to keyboards or keyboard interface, it shall meet requirement 6.1.6.1 (Operation without keyboard interface: Closed functionality).

12.2.1.1.3 Character key shortcuts (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to keyboards or keyboard interface, it shall meet requirement 6.1.6.1 (Operation without keyboard interface: Closed functionality).

12.2.2 Enough time

12.2.2.1 Timing adjustable, Pause, stop, hide

Where ICT is non-web software that provides a user interface, it shall satisfy the the similar requirement as in clause 11.2.2 replacing the word content with software.

12.2.3 Seizures and physical reactions

12.2.3.1 Three flashes or below threshold

Where ICT is non-web software that provides a user interface, it shall satisfy the similar requirement as in clause 11.2.2 replacing the word document with software

12.2.4 Navigable

Notes :

1. The related web page requirement "Bypass blocks" does not apply to single software programs, but to a specific definition of "sets of software programs" that are extremely rare.
2. Although not a requirement, it is generally considered best practice, and to address user needs, to be able to bypass blocks of content that are repeated within software.

Notes :

1. The related web page requirement "Page titled" does not apply to single software programs, but to a specific definition of "sets of software programs" that are extremely rare.
2. Although the name of a software product could be a sufficient title if it describes the topic or purpose, software names are trademarked and trademark names cannot by law be descriptive names. It is not practical to make software names both unique and descriptive.

12.2.4.1 Focus order

Where ICT is non-web software that provides a user interface, it shall satisfy the software success criterion for Focus order that states that If software can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.

12.2.4.2 Link purpose (in context)

Where ICT is non-web software that provides a user interface, it shall satisfy the requirement in 11.2.4.2.

NOTE: The related web page requirement for "Multiple ways" applies to "Sets" of web pages. In software, the equivalent to "sets of web pages" would be "sets of software", but these are extremely rare and an equivalent is not included in this clause on software requirements.

12.2.4.3 Headings and labels

Where ICT is non-web software that provides a user interface, it shall describe topic or purpose.

Note :

In software, headings and labels are used to describe sections of content and controls respectively. In some cases it may be unclear whether a piece of static text is a heading or a label. But whether treated as a label or a heading, the requirement is the same: that if they are present they describe the topic or purpose
of the item(s) they are associated with.

12.2.4.4 Focus visible

Where ICT is non-web software that provides a user interface, it shall satisfy the requirement 11.2.4.4 of this document.

12.2.5 Input modalities

12.2.5.1 Pointer gestures

Where ICT is non-web software that provides a user interface, it shall satisfy the software success criterion for pointer gestures that states that all functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture, unless a multipoint or path-based gesture is essential.

Notes :

This requirement applies to non-web software that interprets pointer actions (i.e. this does not apply to actions that are required to operate the user agent or assistive technology).

12.2.5.2 Pointer cancellation

Where ICT is non-web software that provides a user interface, it shall satisfy the Software success criterion Pointer cancellation that states that for functionality that can be operated using a single pointer, at least one of the following is true:

a) No Down-Event: The down-event of the pointer is not used to execute any part of the function.
b) Abort or Undo: Completion of the function is on the up-event, and a mechanism is available to abort the function before completion or to undo the function after completion.
c) Up Reversal: The up-event reverses any outcome of the preceding down-event.
d) Essential: Completing the function on the down-event is essential.

Notes :

1. Functions that emulate a keyboard or numeric keypad key press are considered essential.
2. This requirement applies to non-web software that interprets pointer actions (i.e. this does not apply to actions that are required to operate the user agent or assistive technology).

12.2.5.3 Label in name

12.2.5.3.1 Label in name (open functionality)

Where ICT is non-web software that provides a user interface, it shall satisfy WCAG 2.1 Success Criterion 2.5.3 Label in Name.

12.2.5.3.2 Label in name (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it should meet requirement 6.1.3.3 (Auditory output correlation).

12.2.5.4 Motion actuation

Where ICT is non-web software that provides a user interface, it shall satisfy WCAG 2.1 Success Criterion 2.5.4 Motion Actuation.

12.3 Understandable

12.3.1 Readable

12.3.1.1 Language of software

12.3.1.1.1 Language of software (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy Software success criterion for Language of software which states that the default human language of software can be programmatically determined.

Notes :

1. Where software platforms provide a "locale / language" setting, applications that use that setting and render their interface in that "locale / language" would comply with this success criterion. Applications that do not use the platform "locale / language" setting but instead use an accessibility-supported method for exposing the human language of the software would also comply with this success criterion. Applications implemented in technologies where assistive technologies cannot determine the human language and that do not support the platform "locale / language" setting may not be able to meet this success criterion in that locale / language.
2. This success criterion is identical to the WCAG 2.1 Success Criterion 3.1.1 Language of page, replacing "each web page" with "software" and with the addition of note 1 above

12.3.1.1.2 Language of software (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.14 (Spoken languages).

Note : To apply the related web page requirement for "Language of parts" to software would require the marking-up of all text in all locations within the software. This would be impossible so an equivalent is not included in this clause on software requirements.

12.3.2 Predictable

12.3.2.1 On focus

Where ICT is non-web software that provides a user interface, it shall satisfy the WCAG 2.1 Success Criterion 3.2.1 On Focus.

Note : Some compound documents and their user agents are designed to provide significantly different viewing and editing functionality depending upon what portion of the compound document is being interacted with (e.g. a presentation that contains an embedded spreadsheet, where the menus and toolbars of the user agent change depending upon whether the user is interacting with the presentation content, or the embedded spreadsheet content). If the user uses a mechanism other than putting focus on that portion of the compound document with which they mean to interact (e.g. by a menu choice or special keyboard gesture), any resulting change of context would not be subject to this success criterion because it was not caused by a change of focus.

12.3.2.2 On input

Where ICT is non-web software that provides a user interface, it shall satisfy the WCAG 2.1 Success Criterion 3.2.2 On Input.

Note : The related web page requirement for "Consistent navigation" applies to "Sets" of web pages. While consistency within software is desirable, "sets of software" in the same sense as "sets of web pages", are extremely rare and an equivalent is not included in this clause on software requirements.

Note : The related web page requirement for "Consistent identification" applies to "Sets" of web pages. In software, the equivalent to "sets of web pages" would be "sets of software", but these are extremely rare and an equivalent is not included in this clause on software requirements.

12.3.3 Input assistance

12.3.3.1 Error identification

12.3.3.1.1 Error identification (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to assistive technologies for screen reading, it shall satisfy the WCAG 2.1 Success Criterion 3.3.1 Error Identification.

12.3.3.1.2 Error Identification (closed functionality)

Where ICT is non-web software that provides a user interface which is closed to assistive technologies for screen reading, it shall meet requirement 6.1.3.15 (Non-visual error identification).

12.3.3.2 Labels or instructions

Where ICT is non-web software that provides a user interface, it shall satisfy the WCAG 2.1 Success Criterion 3.3.2 Labels or Instructions.

12.3.3.3 Error suggestion

Where ICT is non-web software that provides a user interface, it shall satisfy the WCAG 2.1 Success Criterion 3.3.3 Error Suggestion.

12.3.3.4 Error prevention (legal, financial, data)

Where ICT is non-web software that provides a user interface, it shall satisfy the software success criterion for Error prevention (legal, financial, data) that states that for software that cause legal commitments or financial transactions for the user to occur, that modify or delete usercontrollable data in data storage systems, or that submit user test responses, at least one of the following is true:

1. Reversible: Submissions are reversible.
2. Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.
3. Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.

Note : This success criterion is identical to the WCAG 2.1 Success Criterion 3.3.4 Error Prevention (Legal, Financial, Data) replacing "web pages" with "software".

12.4 Robust

12.4.1 Compatible

12.4.1.1 Parsing

12.4.1.1.1 Parsing (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to any assistive technologies, it shall satisfy the software success criterion for Parsing that states that for software that uses markup languages, in such a way that the markup is separately exposed and available to assistive technologies and accessibility features of software or to a user-selectable user agent, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features.

Notes :

1. Start and end tags that are missing a critical character in their formation, such as a closing angle bracket or a mismatched attribute value quotation mark are not complete.
2. Markup is not always available to assistive technology or to user selectable user agents such as browsers. In such cases, conformance to this [requirement] would have no impact on accessibility as it can for web content where it is exposed.
3. Examples of markup that is separately exposed and available to assistive technologies and to user agents include but are not limited to: documents encoded in HTML, ODF, and OOXML. In these examples, the markup can be parsed entirely in two ways: (a) by assistive technologies which may directly open the document, (b) by assistive technologies using DOM APIs of user agents for these document formats.
4. Examples of markup used internally for persistence of the software user interface that are never exposed to assistive technology include but are not limited to: XUL and FXML. In these examples assistive technology only interacts with the user interface of generated software.
5. This success criterion is identical to the WCAG 2.1 Success Criterion 4.1.1 Parsing replacing "In content implemented using markup languages" with "For software that uses markup languages, in such a way that the markup is separately exposed and available to assistive technologies and accessibility features of software or to a user-selectable user agent" with the addition of notes 2, 3 and 4 above.

12.4.1.1.2 Parsing (closed functionality)

Not applicable.

Note : Where ICT is non-web software that provides a user interface which is closed to all assistive technology it does not have to meet the "Parsing" success criterion as stated above because the intent of this success criterion is to provide consistency so that different user agents or assistive technologies will yield the same result.

12.4.1.2 Name, role, value

12.4.1.2.1 Name, role, value (open functionality)

Where ICT is non-web software that provides a user interface and that supports access to any assistive technologies, it shall satisfy the software success criterion for Name, role, value which states that,For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.

Notes :

1. This success criterion is primarily for software developers who develop or use custom user interface components. Standard user interface components on most accessibility-supported platforms already meet this success criterion when used according to specification.
2. For conforming to this success criterion, it is usually best practice for software user interfaces to use the accessibility services provided by platform software. These accessibility services enable interoperability between software user interfaces and both assistive technologies and accessibility features of software in standardised ways. Most platform accessibility services go beyond programmatic exposure of name and role, and programmatic setting of states, properties and values (and notification of same), and specify additional information that could or should be exposed and / or set (for instance, a list of the available actions for a given user interface component, and a means to programmatically execute one of the listed actions).
3. This success criterion is identical to the WCAG 2.1 Success Criterion 4.1.2 Name, Role, Value replacing the original WCAG 2.1 note with: "This success criterion is primarily for software developers who develop or use custom user interface components. Standard user interface components on most accessibility supported platforms already meet this success criterion when used according to specification." and the addition of note 2 above.

12.4.1.2.2 Name, role, value (closed functionality)

Not applicable.

Note: Where ICT is non-web software that provides a user interface which is closed to all assistive technology it does not have to meet the "Name, role, value" success criterion as stated above because this success criterion requires information in a programmatically determinable form.

12.4.1.3 Status messages

12.4.1.3.1 Status messages (open functionality)

Where ICT is non-web software, it shall satisfy WCAG 2.1 Success Criterion 4.1.3 Status Messages.

12.4.1.3.2 Status messages (closed functionality)

Not applicable.

12.5 Interoperability with assistive technology

12.5.1 Closed functionality

Where the closed functionality of software conforms to clause 6.1 (Closed functionality) it shall not be required to conform with clause 12.5.2 to clause 12.5.2.17.

12.5.2 Accessibility services

12.5.2.1 Platform accessibility service support for software that provides a user Interface

Platform software shall provide a set of documented platform services that enable software that provides a user interface running on the platform software to interoperate with assistive technology.

Where a user interface concept corresponding to one of the clauses 12.5.2.5 to 12.5.2.17 is supported within the software environment, the platform software should support that requirement. For example, selection attributes from clause 12.5.2.14 (Modification of focus and selection attributes) may not exist in environments that do not allow selection, which is most commonly associated with copy and paste.

Notes :

1. These define the minimum functionality of software providing user interfaces when using platform services.
2. In some platforms these services may be called accessibility services, but in some other platforms these services may be provided as part of the user interface services.
3. User interface services that provide accessibility support by default are considered to be part of the services provided to conform to this clause (e.g. the service for creating a new user interface element provides role, state, boundary, name and description).
4. To comply with this requirement the platform software can provide its own set of services or expose the services provided by its underlying platform layers, if those services conform to this requirement.
5. Within specific programming environments, the technical attributes associated with the user interface properties described in clauses 12.5.2.5 to 12.5.2.17 might have different names than those used within the clauses.

12.5.2.2 Platform accessibility service support for assistive technologies

Platform software shall provide a set of documented platform accessibility services that enable assistive technology to interoperate with software that provides a user interface running on the platform software. Where a user interface concept corresponding to one of the clauses 12.5.2.5 to 12.5.2.17 is supported within the software environment, the platform software should support that requirement. For example, selection attributes from clause 12.5.2.14 (Modification of focus and selection attributes) may not exist in environments that do not allow selection, which is most commonly associated with copy and paste.

Notes :

1. These define the minimum functionality available to assistive technologies when using platform services.
2. The definition of platform in clause 3.1 applies to software that provides services to other software, including but not limited to, operating systems, web browsers, virtual machines.
3. In some platforms these services may be called accessibility services, but in some other platforms these services may be provided as part of the user interface services.
4. Typically these services belong to the same set of services that are described in clause 12.5.2.1.
5. To comply with this requirement the platform software can provide its own set of services or expose the services provided by its underlying platform layers, if those services conform to this requirement.

12.5.2.3 Use of accessibility services

Where the software provides a user interface it shall use the applicable documented platform accessibility services. If the documented platform accessibility services do not allow the software to meet the applicable requirements of clauses 12.5.2.5 to 11.5.2.17, then software that provides a user interface shall use other documented services to interoperate with assistive technology.

Note : The term "documented platform accessibility services" refers to the set of services provided by the platform according to clauses 12.5.2.1 and 12.5.2.2.
It is best practice to develop software using toolkits that automatically implement the underlying platform accessibility services.

12.5.2.4 Assistive technology

Where the ICT is assistive technology it shall use the documented platform accessibility services.

Notes :

1. The term "documented platform accessibility services" refers to the set of services provided by the platform according to clauses 12.5.2.1 and 12.5.2.2.
2. Assistive technology can also use other documented accessibility services.

12.5.2.5 Object information

Where the software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make the user interface elements' role, state(s), boundary, name, and description programmatically determinable by assistive technologies.

12.5.2.6 Row, column, and headers

Where the software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make the row and column of each cell in a data table, including headers of the row and column if present, programmatically determinable by assistive technologies.

12.5.2.7 Values

Where the software provides a user interface, it shall, by using the services as described in clause 12.5.2.3, make the current value of a user interface element and any minimum or maximum values of the range, if the user interface element conveys information about a range of values, programmatically determinable by assistive technologies.

12.5.2.8 Label relationships

Where the software provides a user interface it shall expose the relationship that a user interface element has a label for another element, or of being labelled by another element, using the services as described in clause 12.5.2.3, so that this information is programmatically determinable by assistive technologies.

12.5.2.9 Parent-child relationships

Where the software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make the relationship between a user interface element and any parent or children elements programmatically determinable by assistive technologies.

12.5.2.10 Text

Where the software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make the text contents, text attributes, and the boundary of text rendered to the screen programmatically determinable by assistive technologies.

12.5.2.11 List of available actions

Where the software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make a list of available actions that can be executed on a user interface element, programmatically determinable by assistive technologies.

12.5.2.12 Execution of available actions

Where permitted by security requirements, software that provides a user interface shall, by using the services as described in clause 12.5.2.3, allow the programmatic execution of the actions exposed according to clause 12.5.2.11 by assistive technologies.

Notes :

1. In some cases the security requirements imposed on a software product may forbid external software from interfering with the ICT product. Examples of systems under strict security requirements are systems dealing with intelligence activities, cryptologic activities related to national security, command and control of military forces.
2. Assistive technologies may be required to maintain the same level of security as the standard input mechanisms supported by the platform.

12.5.2.13 Tracking of focus and selection attributes

Where software provides a user interface it shall, by using the services as described in clause 12.5.2.3, make information and mechanisms necessary to track focus, text

insertion point, and selection attributes of user interface elements programmatically determinable by assistive technologies.

12.5.2.14 Modification of focus and selection attributes

Where permitted by security requirements, software that provides a user interface shall, by using the services as described in clause 12.5.2.3, allow assistive technologies to programmatically modify focus, text insertion point, and selection attributes of user interface elements where the user can modify these items.

Notes :

1. In some cases the security requirements imposed on a software product may forbid external software from interfering with the ICT product and so this requirement would not apply. Examples of systems under strict security requirements are systems dealing with intelligence activities, cryptologic activities related to national security, command and control of military forces.
2. Assistive technologies may be required to maintain the same level of security as the standard input mechanisms supported by the platform.

12.5.2.15 Change notification

Where software provides a user interface it shall, by using the services as described in clause 12.5.2.3, notify assistive technologies about changes in those programmatically determinable attributes of user interface elements that are referenced in requirements 12.5.2.5 to 12.5.2.11 and 12.5.2.13.

12.5.2.16 Modifications of states and properties

Where permitted by security requirements, software that provides a user interface shall, by using the services as described in clause 12.5.2.3, allow assistive technologies to programmatically modify states and properties of user interface elements, where the user can modify these items.

Notes :

1. In some cases the security requirements imposed on a software product may forbid external software from interfering with the ICT product and so this requirement would not apply. Examples of systems under strict security requirements are systems dealing with intelligence activities, cryptologic activities related to national security, command and control of military forces.
2. Assistive technologies may be required to maintain the same level of security as the standard input mechanisms supported by the platform.

12.5.2.17 Modifications of values and text

Where permitted by security requirements, software that provides a user interface shall, by using the services as described in clause 12.5.2.3, allow assistive technologies to modify values and text of user interface elements using the input methods of the platform, where a user can modify these items without the use of assistive technology.

Notes :

1. In some cases the security requirements imposed on a software product may forbid external software from interfering with the ICT product and so this requirement would not apply. Examples of systems under strict security requirements are systems dealing with intelligence activities, cryptologic activities related to national security, command and control of military forces.
2. Assistive technologies may be required to maintain the same level of security as the standard input mechanisms supported by the platform.

12.6 Documented accessibility usage

12.6.1 User control of accessibility features

Where software is a platform it shall provide sufficient modes of operation for user control over those platform accessibility features documented as intended for users.

12.6.2 No disruption of accessibility features

Where software provides a user interface it shall not disrupt those documented accessibility features that are defined in platform documentation except when requested to do so by the user during the operation of the software.

12.7 User preferences

Where software is not designed to be isolated from its platform, and provides a user interface, that user interface shall follow the values of the user preferences for platform settings for: units of measurement, colour, contrast, font type, font size, and focus cursor except where they are overridden by the user.

Notes :

1. Software that is isolated from its underlying platform has no access to user settings in the platform and thus cannot adhere to them.
2. For web content, the underlying platform is the user agent.
3. This does not preclude the software from having additional values for a setting as long as there is one mode where the application will follow the system settings even if more restricted.

12.8 Authoring tools

12.8.1 General (informative)

For those creating web content authoring tools, ATAG 2.0 [i.32] provides information that can be of interest to those who want to go beyond these requirements.

Note : This is applicable both to standalone and to web based authoring tools.

12.8.2 Content technology

Authoring tools shall conform to clauses 12.8.2 to 12.8.5 to the extent that information required for accessibility is supported by the format used for the output of the authoring tool.

12.8.3 Accessible content creation

Authoring tools shall enable and guide the production of content that conforms to clauses 10 (Web content) or 11 (Non-Web content) as applicable.

Note : Authoring tools may rely on additional tools where conformance with specific requirements is not achievable by a single tool. For example, a video editing tool may enable the creation of video files for distribution via broadcast television and the web, but authoring of caption files for multiple formats may be provided by a different tool.

12.8.4 Preservation of accessibility information in transformations

If the authoring tool provides restructuring transformations or re-coding transformations, then accessibility information shall be preserved in the output if equivalent mechanisms exist in the content technology of the output.

Notes :

1. Restructuring transformations are transformations in which the content technology stays the same, but the structural features of the content are changed (e.g. linearizing tables, splitting a document into pages).
2. Re-coding transformations are transformations in which the technology used to encode the content is changed.

12.8.5 Repair assistance

If the accessibility checking functionality of an authoring tool can detect that content does not meet a requirement of clauses 10 (Web) or 11 (Non-web documents) as applicable, then the authoring tool shall provide repair suggestion(s).

Note : This does not preclude automated and semi-automated repair which is possible (and encouraged) for many types of content accessibility problems.

12.8.6 Templates

When an authoring tool provides templates, at least one template that supports the creation of content that conforms to the requirements of clauses 10 (Web) or 11(Non-web documents) as applicable shall be available and identified as such.

13. Documentation and support services

13.0 Product documentation

13.0.1 Accessibility and compatibility features

Product documentation provided with the ICT whether provided separately or integrated within the ICT shall list and explain how to use the accessibility and compatibility features of the ICT.

Notes:

1. Accessibility and compatibility features include accessibility features that are built-in and accessibility features that provide compatibility with assistive technology.

2. It is best practice to use WebSchemas/Accessibility 2.0 [i.38] to provide meta data on the accessibility of the ICT.
3. The accessibility statement and help pages are both examples of the provision of product information.

13.0.2 Accessible documentation

Product documentation provided with the ICT shall be made available in at least one of the following electronic formats:

a) a Web format that conforms to the requirements of clause 10; or
b) a non-web format that conforms to the requirements of clause 11.

NOTES:
1. This does not preclude the possibility of also providing the product documentation in other formats (electronic, printed or audio) that are not accessible.
2. It also does not preclude the possibility of providing alternate formats that meet the needs of some specific type of users (e.g. Braille documents for blind people or easy-to-read information for persons with limited cognitive, language and learning abilities).
3. Where documentation is incorporated into the ICT, the documentation falls under the requirements for accessibility in the present document.
4. A user agent that supports automatic media conversion would be beneficial to enhancing accessibility.

13.1 Support services

13.1.1 General (informative)

ICT support services include, but are not limited to: help desks, call centres, technical support, relay services and training services.

13.1.2 Information on accessibility and compatibility features

ICT support services shall provide information on the accessibility and compatibility features that are mentioned in the product documentation.

NOTE: Accessibility and compatibility features include accessibility features that are built-in and accessibility features that provide compatibility with assistive technology.

14. ICT providing relay or emergency service access

14.0 Relay services requirements

14.0.1 General (informative)

Relay services enable users of different modes of communication e.g. text, sign, speech, to interact remotely through ICT with two-way communication by providing conversion between the modes of communication, normally by a human operator. It is best practice to meet the applicable relay service requirements of ETSI ES 202 975 [i.5].

14.0.2 Text relay services

Where ICT is intended to provide a text relay service, the text relay service shall enable text users and speech users to interact by providing conversion between the two modes of communication.

14.0.3 Sign relay services

Where ICT is intended to provide a sign relay service, the sign relay service shall enable sign language users and speech users to interact by providing conversion between the two modes of communication.

NOTE: Sign relay services are also sometimes referred to as sign language relay services or video relay services.

14.0.4 Lip-reading relay services

Where ICT is intended to provide a lip-reading relay service, the lip-reading service shall enable lip-readers and voice telephone users to interact by providing conversion between the two modes of communication.

14.0.5 Captioned telephony services

Where ICT is intended to provide a captioned telephony service, the captioned telephony service shall assist a deaf or hard of hearing user in a spoken dialogue by providing text captions translating the incoming part of the conversation.

14.0.6 Speech to speech relay services

Where ICT is intended to provide a speech to speech relay service, the speech to speech relay service shall enable telephone users who are speech impaired, have limited cognitive, language and learning abilities, as well as any other user, to communicate by providing assistance between them.

14.1 Access to relay services

Where ICT systems support two-way communication, and the system is specified for use with relay services, access to those relay services shall not be prevented for outgoing and incoming calls involving: voice, RTT, or video, either individually or in combinations supported by both the relay service and the ICT system.

Notes

1. The purpose of this requirement is to achieve functionally equivalent communication access by persons with disabilities.
2. The system may be specified as needing to work with relay services by, for example: procurers, regulators, or product specifications.

14.2 Access to emergency services

Where ICT systems support two-way communication, and the system is specified for use with emergency services, access to those emergency services shall not be prevented for outgoing and incoming calls involving: voice, RTT, or video, either individually or in combinations supported by both the emergency service and the ICT system.

Notes:

1. The purpose of this requirement is to achieve functionally equivalent communication access to the emergency service by persons with disabilities.
2. The system may be specified as needing to work with emergency services by, for example: procurers, regulators, or product specifications.

Bibliography

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b) Communication Services Accessibility to Persons with Disabilities Guidelines 2023, issued and published by Tanzania Communications Regulatory Authority (TCRA);
c) The United Republic of Tanzania Electronic and Postal Communications Act of Tanzania of 2022.
d) Persons with Disabilitites Act of Tanzania of 2010.