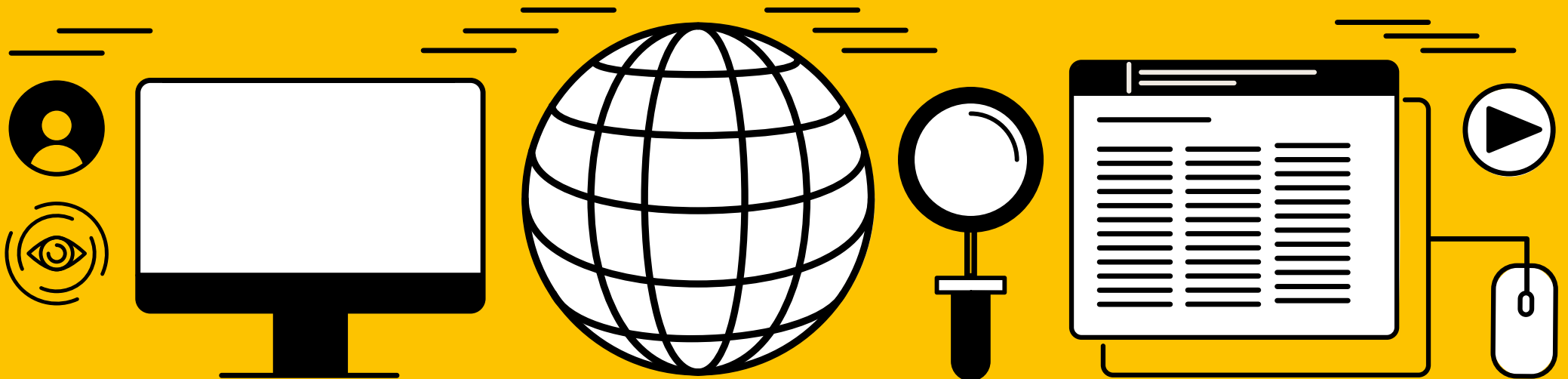


# Digital Accessibility Toolkit



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# Purpose of the toolkit

**The purpose of this toolkit is to share a selection of tools and recommendations pertaining to the accessibility of Information and Communication Technologies (ICT). Based on international standards and a scan of available technologies, these tools and recommendations are intended to contribute to the social and economic inclusion of persons with disabilities by ensuring that information is equitably accessible.**

CBM is committed to the principle that persons with disabilities should be able to fully participate in society on an equal basis. Our approach is based on the principles of the UN Convention on the Rights of Persons with Disabilities (CRPD) and on CBM's responsibility to promote accessibility and the principles of universal design in all spheres of its work, including CBM's digital content and communications.

## The goals of this toolkit are:

- To **outline** the key international frameworks around digital accessibility and why it is critical for inclusion of persons with disabilities.
- To **link** people with tools, practice examples, free online training, and other resources so that their practice is digitally accessible.
- To **ensure** that digital accessibility is an inherent aspect of daily practice.
- To **align** the practices of those working with and for CBM.

## Who is this toolkit aimed at?

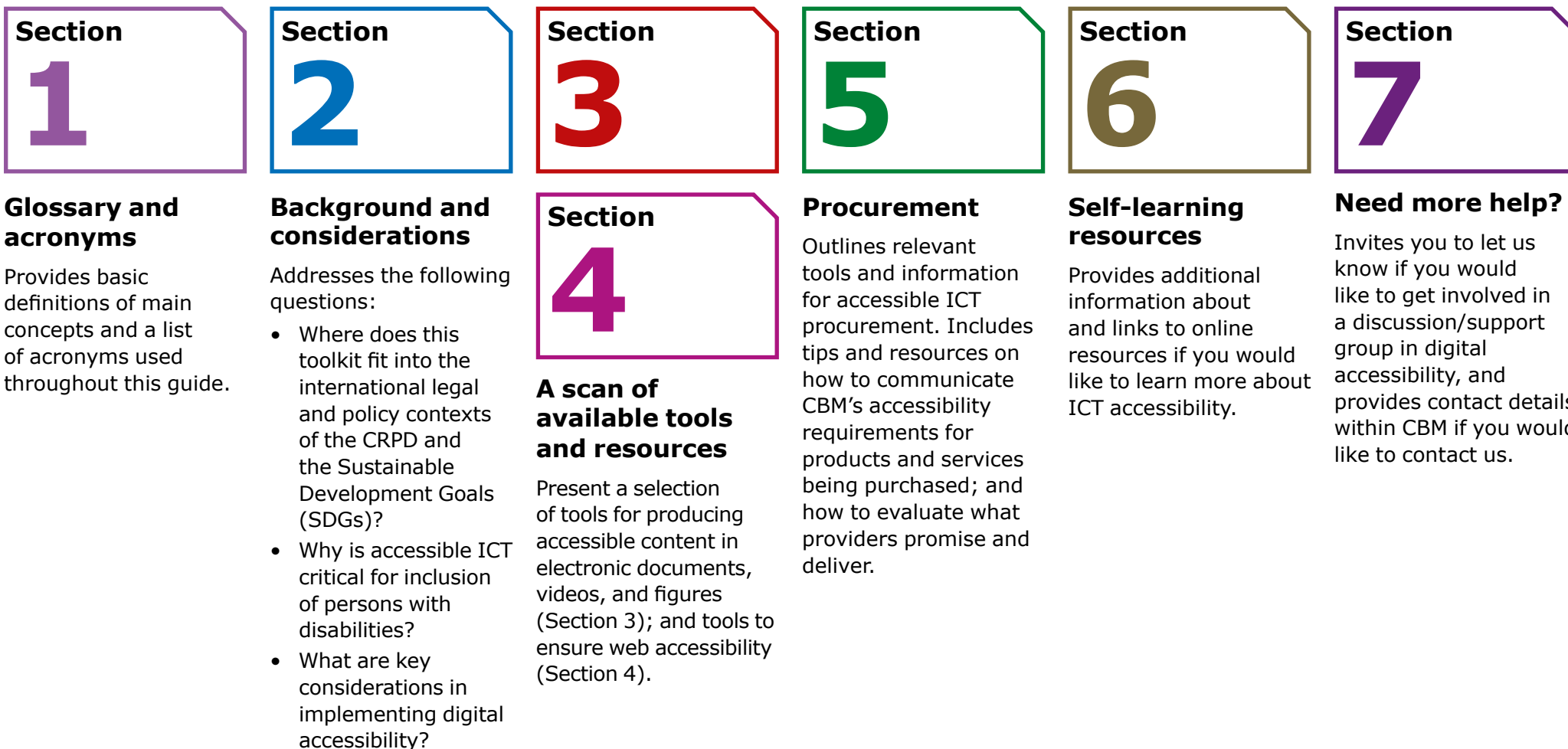
This toolkit is intended to be used as a guide and practice resource by people working with and for CBM so that we produce accessible digital content and communications, and place accessibility at the centre of our ICT procurement processes.

We hope that the toolkit will be a resource for the wider community of persons with disabilities, Disabled People's Organisations (DPOs), and non-governmental organisations (NGOs).

## Disclaimer: accessibility of links and websites

As far as possible, CBM uses and links to accessible external websites – always recommending an accessible external resource over one that is not accessible. However, we cannot guarantee that external resources are always accessible or that you won't need to scroll down or search another website to find the information we link to.

# Structure of the toolkit



# CBM Digital Toolkit

Make your information accessible from the start

Before you write that report

→ [Section 3](#)

What are the international standards?

→ [Section 2](#)

Planning a presentation?

→ [Section 3](#)

Working in Microsoft, Adobe or InDesign?

→ [Section 3](#)

What role does alt text play?

→ [Section 3](#)

Why is accessibility important and how does it benefit society?

→ [Section 2](#)

How do I make my website accessible?

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I want to learn more

→ [Section 6](#)

Who do I contact in CBM about digital accessibility?

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What about video accessibility?

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Make accessibility part of your procurement process

→ [Section 5](#)

What about email?

→ [Section 3](#)

## Section 1

# Glossary and acronyms

# 1.1 Glossary

**Accessibility<sup>1</sup>:**

means ensuring that persons with disabilities are able to have access to the physical environment around them, to transportation, to information such as reading material, to communication technology, and systems on an equal basis with others. Accessibility requires forward thinking by those responsible for procurement and delivery of private and public services, products, systems, environments, and facilities to ensure that persons with disabilities can access and use services without barriers.

**Accessibility features:**

include any accessible technology, assistive technology, and specialty hardware and software that are either built-in or added on to products. The purpose of these features is to make technology easier to use by meeting a user preference, a user need, or facilitating a user interaction with the technology.

**Accessible formats:**

information available in formats such as, but not limited to, Braille, tactile graphics, large print, text-to-speech, oral presentation, electronic files compatible with screen readers, captioned or signed video for persons with hearing impairments, or icons and animations, 3D models for persons with cognitive disabilities.

**Agile software development:**

describes a set of values and principles for software development as defined in the [Agile Manifesto](#)<sup>2</sup>. The Agile methods goal is to enhance the value of the delivered product in order to satisfy the customer's requirements. It advocates for individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, responding to change over following a plan.

**Alternative (alt) format:**

refers to formats, such as large print or Braille, for people who have difficulty reading or cannot read standard print. Alt format can also mean converting from one type of file format, such as PDF, to another format, such as Word or HTML.

**Alternative (or Alt) text:**

text for all non-text content, including photos, graphs, tables, so that both their content and function can be accessed by screen readers.

**App:**

common abbreviation for application. It is software that is developed to run on a mobile phone or a tablet.

**Assistive technology:**

any information and communications technology, product, device, equipment, and related service used to maintain, increase, or improve the functional capabilities of individuals with specific needs or disabilities.

**Barriers:**

when discussed in relation to persons with disabilities, barriers can have a number of meanings. They can be structural barriers, such as physical barriers (for example, stairs) or digital (for example, inaccessible websites), or in how a society organises itself in areas such as welfare and support services, opportunities to own or control resources, and decision making. Barriers can also be attitudinal, for example prejudice and negative perceptions of persons with disabilities can create barriers hindering their full and equal participation in society.

**Cheat sheets:**

quick reference guides, for example to Microsoft Word or Adobe InDesign.



## 1.1 Glossary

### **Civil society:**

civil society is the term used to describe non-state actors (individuals or groups that are not part of the government). It is made up of a wide range of people and groups such as charitable or not-for-profit organisations, self-help groups, unions, indigenous people's organisations, faith based groups, and many other activist groups advocating for rights. Disabled People's Organisations (DPOs) have an important role to play as part of civil society.

### **Communication:**

is defined by the CRPD as including all possible means of communications that may eliminate barriers: "Communication includes languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communications technologies" ([Article 2](#))<sup>3</sup>.

### **Community of practice (CoP):**

a group of people who come together to share common interests and goals, with the aim of sharing information, developing knowledge, and developing themselves both personally and professionally<sup>4</sup>. Within such a community, people share their experience and tacit knowledge in free flow, improving their abilities and skills, and

fostering learning. CoP members explore ideas, discuss situations and needs, and help each other solve problems, although they do not meet every day.

### **Convention on the Rights of Persons with Disabilities (CRPD):**

the CRPD is an international human rights treaty, which protects the rights and dignity of persons with disabilities. Parties to the Convention (those who have ratified it) are required to promote, protect, and ensure the full enjoyment of human rights by persons with disabilities.

### **Digital accessibility or Information and Communication Technologies (ICT) accessibility:**

is generally accepted as being the quality of a mainstream technology such as a computer, mobile phone, self-service kiosk, piece of software or any device that acts as a digital content holder, to be used by the widest range of users possible, regardless of their abilities or disabilities.

### **Disability:**

According to the CRPD, [Article 1](#) states that "Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others"<sup>5</sup>.

### **Disabled People's Organisations (DPOs):**

Disabled People's Organisations are made up and led by persons with disabilities who lobby and advocate for the rights of their members. Some DPOs are impairment focussed. Others are cross disability and include a diverse group of persons with disabilities. Some DPOs have a focus on specific issues – such as women's DPOs. Others may focus on a particular interest such as sports. Some DPOs also focus on services or providing opportunities for employment and loans. A general definition of a DPO is a representative organisation or group of persons with disability, where persons with disability make up the majority of the staff, management, board, and volunteers – at all levels of the organisation.

### **Functionality:**

in information technology, functionality is what a product, such as a software application or computing device, can do for a user, and includes any aspect of that product.

### **Hardware:**

in information technology, hardware is the physical aspect of computers, telecommunications, and other devices. The term arose as a way to distinguish the "box", electronic circuitry, and components of a computer from the programme you put in it to make it do things. The programme came to be known as the software.

## 1.1 Glossary

### **Inclusion:**

is when all people participate in all aspects of civil, political, social, and economic life. At state level it is the process by which traditionally marginalised groups are consulted and considered in all policy and budgetary decisions. The disabled people's movement advocates strongly for inclusion of persons with disabilities at all levels, and especially in compliance with CRPD that States meet their obligations for all government public policy at national and district levels.

### **Inclusive development:**

ensures that marginalised groups actively participate and benefit from the development processes and outcomes, regardless of their age, gender, disability, state of health, ethnic origin, sexual orientation, religion, or any other characteristics. It seeks to address the deepening inequality and consequent lack of access to opportunities for those who are excluded from development gains and processes<sup>6</sup>.

### **Information and Communication Technologies (ICT):**

while different people and organisations understand differently what information and communications technology (ICT) means, it is generally acknowledged that ICT is an umbrella term that includes any information and communication device or application and its

content. Such a definition encompasses a wide range of access technologies, such as radio, television, satellite, mobile phones, fixed lines, computers, network hardware, and software<sup>7</sup>.

### **Language<sup>8</sup>:**

includes spoken and signed languages and other forms of non-spoken languages.

### **New Urban Agenda:**

was adopted in October 2016 at the UN Conference on Housing and Sustainable Development, also known as "Habitat III". It is an action-oriented document which sets out global standards of achievement in sustainable urban development for the next 20 years, guiding the efforts around urbanisation of a wide range of actors: nation states, city and regional leaders, international development funders, United Nations programmes as well as civil society, including the private sector.

### **Non-discrimination:**

requires that people are entitled to equal treatment irrespective of their particular characteristics. It is used to assess apparently neutral criteria that may produce effects, which systematically disadvantage persons possessing those characteristics. Non-discrimination is fundamental to the human rights based approach and one of the underlying principles of the CRPD.

### **Sendai Framework for Disaster Risk**

#### **Reduction:**

was adopted in March 2015 and is a voluntary, non-binding agreement which recognises that the State has the primary role to reduce disaster risk, but that responsibility should be shared with local government, the private sector, and other stakeholders. Through its seven targets and four priorities for action, it aims for the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities, and countries.

#### **Software<sup>9</sup>:**

programmes that run on a computer or electronic device and perform certain functions.

#### **Standard<sup>10</sup>:**

a document that provides requirements, specifications, guidelines, or characteristics that can be used consistently to ensure that materials, products, processes, and services are fit for their purpose.

## 1.1 Glossary

### **Sustainable Development Goals (SDGs):**

were established by the United Nations in September 2015. It is a joint plan that has 17 goals highlighting three dimensions of development: economic, social, and environmental. Governments, UN agencies, non-governmental organisations, and the business sector have agreed to work in partnership to try to end poverty, promote peace, share wealth, and protect the planet by 2030. This plan is also known as “Agenda 2030”.

### **Universal design<sup>11</sup>:**

means the design of products, environments, programmes, and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed. Similar terms are used depending on the context including: design for all, inclusive design, and universal accessibility.

### **Usability<sup>12</sup>:**

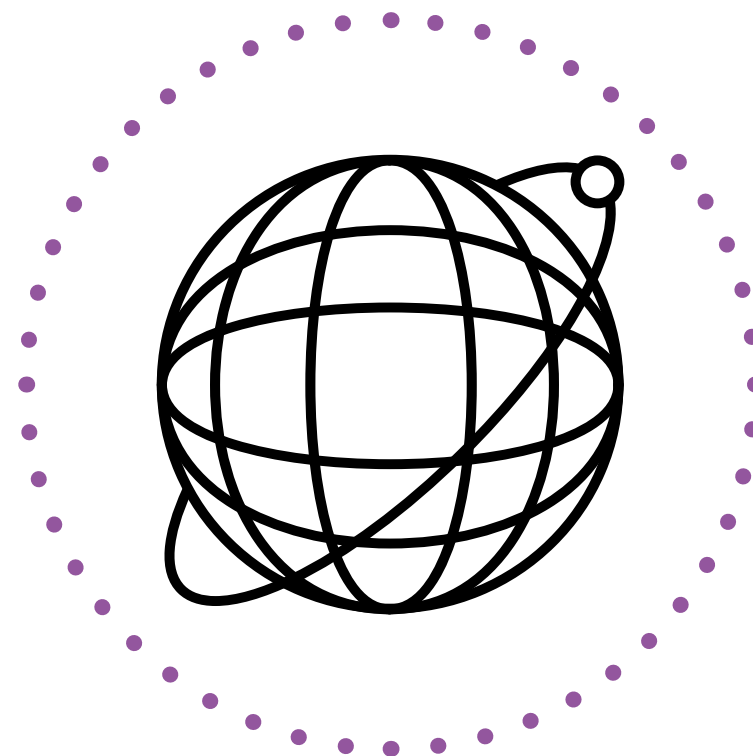
the extent to which a system, product, or service can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use.

### **User-centred design:**

is a collection of processes which focus on putting users at the centre of product design and development. The development of a digital product is made taking into account user’s requirements, objectives, and feedback.

### **Web accessibility<sup>13</sup>:**

web-based content that persons with disabilities can perceive, understand, navigate, interact with, and contribute to.



## 1.2 Acronyms

<b>ADD</b>	Accessible Digital Documents	<b>GDP</b>	Gross Domestic Product	<b>PEAT</b>	Partnership on Employment & Accessible Technology. Note: PEAT is also used to refer to Photosensitive Epilepsy Analysis Tool (TRACE Center) but not in this toolkit.
<b>AMAC</b>	Alternative Media Access Center	<b>GTM</b>	GoToMeeting	<b>PIN</b>	Personal identification number
<b>AT</b>	Assistive Technology	<b>HTML</b>	Hypertext Markup Language	<b>SDGs</b>	Sustainable Development Goals
<b>ATAP</b>	Association of Assistive Technology Act Programs	<b>IAAP</b>	International Association of Accessibility Professionals	<b>SOAP</b>	Stanford Online Accessibility Program
<b>ATM</b>	Automated Teller Machine	<b>ICT</b>	Information and Communication Technologies	<b>SUNY</b>	State University New York
<b>CAPTCHAs</b>	Completely Automated Public Turing test to tell Computers and Humans Apart	<b>IOS</b>	Interneetwork Operating System (the Apple mobile operating system)	<b>UA</b>	Universal Accessibility
<b>CEN</b>	European Committee for Standardization	<b>IoT</b>	Internet of Things	<b>VPAT</b>	Voluntary Product Accessibility Template
<b>CRPD</b>	Convention on the Rights of Persons with Disabilities	<b>ISO</b>	International Organization for Standardization	<b>W3C</b>	World Wide Web Consortium
<b>DAISY</b>	Digital Accessible Information SYstem	<b>IT</b>	Information Technology	<b>WAI</b>	Web Accessibility Initiative
<b>DCMP</b>	Described and Captioned Media Program	<b>ITIC</b>	Information Technology Industry Council	<b>WAVE</b>	Web Accessibility Evaluation Tool
<b>DESA</b>	Department of Economic and Social Affairs (UN)	<b>ITU</b>	International Telecommunications Union	<b>WBU</b>	World Blind Union
<b>DPO</b>	Disabled People's Organisation	<b>MOOC</b>	Massive Open Online Course	<b>WCAG</b>	Web Content Accessibility Guidelines
<b>DRR</b>	Disaster Risk Reduction	<b>NCDAE</b>	National Center on Disability and Access to Education	<b>WebAIM</b>	Web Accessibility in Mind
<b>EPUB</b>	Electronic Publication	<b>NDA</b>	National Disability Authority	<b>WHO</b>	World Health Organization
<b>G3ict</b>	Global Initiative for Inclusive Information and Communication Technologies	<b>NGO</b>	Non-governmental organisation	<b>WTO</b>	World Trade Organization
<b>GARI</b>	Global Accessibility Reporting Initiative	<b>OS</b>	Operating System		
		<b>PAC</b>	PDF Accessibility Checker		
		<b>PC</b>	Personal Computer		
		<b>PDF</b>	Portable Document Format		

## Section 2

# Background and considerations

## 2.1 Overview

**According to the World Health Organization (WHO), 1 billion people, or 15% of the world's population, experience some form of disability and encounter severe disadvantages because of the few or non-existent conditions of physical and digital accessibility<sup>14</sup>.**

Addressing ICT accessibility is key to achieve full and active participation of every member of society in all aspects of life, including civic, social, economic, and political activities, as well as participation in decision-making processes.

CBM is committed to producing accessible content and communications. It has developed this toolkit to support the use of accessible ICT across all its work and to ensure that information and processes are consistent with the international human rights framework,

and established principles and best practice in this area. This section provides the context within which this toolkit has been developed to highlight just how critical it is for those who work for and with CBM to adhere to the principles of ICT accessibility as well as accessibility in general.

# 1 billion

= 15% of the world's population

experience some form of disability and encounter severe disadvantages because of the few or non-existent conditions of physical and digital accessibility



## 2.2 International frameworks

### 2.2.1 Human rights framework: CRPD

In the CRPD, accessibility is recognised as a vital precondition for persons with disabilities to participate fully and equally in society, effectively enjoying all their human rights and fundamental freedoms. Governments, civil society organisations, and the private sector have a key role to play in ensuring that accessibility is not an afterthought but a central component of their work including core systems and programmes ([article 9](#))<sup>15</sup>. **Information and communications, including information and communications technologies and systems, have been defined as an integral part of accessibility rights** and fundamental to ensuring that persons with disabilities can exercise their right to freedom of expression and opinion. This includes the freedom to seek, receive, and impart information and ideas on an equal basis with others and through all forms of communication of their choice ([article 21](#))<sup>16</sup>. The CRPD also recognises the importance of promoting the concept of universal design ([article 2](#))<sup>17</sup>.

ICT accessibility underpins much of the convention. The articles listed below are not intended to be an exhaustive list and are listed in numerical order.

- **Situations of emergency preparedness and response** ([article 11](#))<sup>18</sup> including situations of armed conflict, humanitarian emergencies, and the occurrence of natural disasters. ICT accessibility plays a vital role in communicating emergency information to citizens.
- **Living independently and being included in the community** ([article 19](#))<sup>19</sup>.
- **Personal mobility** ([article 20](#))<sup>20</sup> including access to quality mobility aids, devices, assistive technologies, and entities that produce mobility aids and assistive technologies.
- **Freedom of expression and opinion, and access to information** ([article 21](#))<sup>21</sup>.
- **Respect for home and the family** ([article 23](#))<sup>22</sup> including access to comprehensive information for family planning.
- **Access to education** ([article 24](#))<sup>23</sup>, including education, internships, and skills training.
- **Access to health** ([article 25](#))<sup>24</sup> to be able to make informed decisions and give consent.
- **Work and employment** ([article 27](#))<sup>25</sup> including access to innovation and e-commerce opportunities.
- **Participation in political and public life** ([article 29](#))<sup>26</sup>.
- **Participation in cultural life, recreation, leisure and sport** ([article 30](#))<sup>27</sup>.

## 2.2 International frameworks

### 2.2.2 Development frameworks and accessibility

The incorporation of accessibility and universal design in the Post-2015 Framework for Disaster Risk Reduction and the New Urban Agenda provide further opportunities to build resilient communities and inclusive Smart cities. Universal and equitable access is also a core foundation of sustainable development and enshrined in Agenda 2030 Sustainable Development Goals (SDGs) in the core commitment of “leave no one behind”. Delivering on these commitments will mean true alignment with the CRPD.

#### Marrakesh Treaty: pivotal for ICT accessibility

The Marrakesh Treaty is a ground-breaking treaty in opening up access to digital information for blind people. According to the World Blind Union (WBU), this treaty should go a long way to ending the book famine faced by people who are blind, visually impaired, or cannot effectively read print. Countries that ratify the treaty are obliged to allow blind people and their organisations to make accessible copies of books without requiring copyright permission. And the treaty also allows for such accessible versions to be imported and exported, again without recourse to copyright permission. As WBU states, however, to make the treaty a reality, countries must sign, ratify, and implement its provisions.<sup>28</sup>

#### + Resources

##### CRPD and inclusive development

[Convention on the Rights of Persons with Disabilities](#)<sup>29</sup> (CRPD) and its [General Comment number 2](#)<sup>30</sup> on accessibility.

[Disability Inclusive Development Toolkit, CBM](#)<sup>31</sup>.

[The inclusion imperative: towards disability-inclusive and accessible urban development: key recommendations for an inclusive urban agenda](#)<sup>32</sup>.

[Smart Cities for All Toolkit](#)<sup>33</sup>.



## 2.3 International accessibility standards

A recognised accessibility standard is usually referenced in legislation, public policy, or organisational policies that require ICT products and services to be accessible. Being “accessible” then means complying with that standard. Accessibility standards for specific product types often attempt to quantify accessibility in measurable ways by listing required attributes, objective tests, and pass/fail criteria.

### + Resources

#### ICT accessibility standards

A guide to implementing priority ICT accessibility standards is available in the [Smart Cities for All Toolkit](#) developed by G3ict and World Enabled<sup>38</sup>.

The following three standards are the most important existing standards that define what accessibility means for ICT and the web.

#### **Web Content Accessibility Guidelines (WCAG 2.0)**

This is an international standard for website accessibility that specifies testable “success criteria” for three compliance levels (A, AA, or AAA). This means it is possible to state objectively whether a given web page is accessible to a recognised level (A is for basic level accessibility and AAA is for the highest). The web content accessibility guidelines can be found on [World Wide Web Consortium \(W3C\) website](#).<sup>34</sup>

#### **Standard EN 301 549**

This standard is used in Europe to guide procurement. The guidelines from this standard outline the functional performance requirement that is expected of ICT equipment, regardless of the physical, cognitive, or sensory abilities of the user.<sup>35</sup> The full text on the [Accessible IT Procurement Toolkit Standard EN 301 549](#) can be found on their webpage<sup>36</sup>.

#### **Section 508 of the Rehabilitation Act**

This is a standard from the United States that is used to guide procurement, and it groups items into six product categories. This standard provides full technical standards to understand what is expected for each of these six categories, as well as how to comply with them. More information regarding the Section 508 standards can be found on the [US Access Board’s website](#)<sup>37</sup>.

CBM concurs with the use of these standards to guide practice. It is important to note that, although the relevant standards try to ensure accessible content to the widest group of users, compliance with these standards may not be sufficient. Expert review or formal user testing (if possible), will often identify issues that are not covered by any standard.

## 2.4 ICT and inclusion

To create fully inclusive societies, public procurement policies and processes for ICT must have accessibility as a required criterion. ICT is central in our lives today and our use of and reliance on digital devices continues to grow. As reported by the Smart Cities for All initiative, “50 billion devices will be connected to the internet by 2020, up from 10 billion in 2012 and just 200 million in 2000”. However, as data from the USA advises, in comparison with the general population persons with disabilities are less likely to own digital devices (20% less likely) or go online (23% as opposed to 8%).<sup>39</sup>

If we do not prioritise ICT accessibility we risk widening the existing inequalities and the digital divide for persons with disabilities. Society requires everyone’s contribution. Without their full and equal participation and contribution, persons with disabilities and other marginalised groups will experience greater disadvantage and discrimination. This section looks at some of the key considerations and benefits in implementing ICT accessibility.

### 2.4.1 Practical considerations

Reliance on digital media, digital products, and the Internet to engage in daily activities such as banking, communicating, and accessing information, is increasing. Digital accessibility is a crucial levelling mechanism to ensure timely and equitable access to education, jobs, and services to persons with disabilities. Increasing technology also brings the means to remove barriers for a wide range of users around real time texts, screen readers, and applications to support people who need memory aids or support to live more independently. Applying universal design principles in current and future technology open up far more opportunities, as the case studies about electronic money transfer and wayfinding navigation solutions through mobile devices show.

### The role of technology in creating inclusive livelihoods: mobile phone technology and banking

M-Pesa, a mobile payments app, enables customers in Kenya to make simple, secure financial transactions using SMS technology. For example, electronic money transfer. You don’t need to have a bank account: M-Pesa (M for mobile and Pesa is Swahili for money) holds its users’ money in a bank account run by the company. M-Pesa has opened up banking for persons with disabilities as well as entrepreneurship, enabling “entrepreneurs of all abilities to succeed”. It also facilitates remote rural communities to participate in the local economy, where before they had been excluded.<sup>40</sup>

In December 2017, M-Pesa IVR (Interactive Voice Response) Solution was launched. While currently only available for checking your M-Pesa balance, it aims to solve the problem of fraud experienced by people with visual impairments where they need to share their PINs when they use M-Pesa.<sup>41</sup>

### **The role of technology in supporting wayfinding navigation solutions for persons with disabilities: two examples of good practice**

[Wheelmap.org](http://Wheelmap.org)<sup>42</sup> is an interactive digital map for finding wheelchair accessible places. Anyone can identify places that are wheelchair accessible, or not, by using a simple 'traffic light' code: green means fully wheelchair accessible, yellow means partly accessible, and red indicates somewhere that is not accessible. There is a wide choice of languages available and it will set to the user's location.

The [Click and Go wayfinding app](#)<sup>43</sup> is a free app that provides navigation information about places like bus or train stations, college campuses, airports, hotels, hospitals – as well as getting to them. It uses VoiceOver and other accessibility tools that are built-in to your mobile device, and you can also mark your favourite venues which makes finding them at a later stage easier.

Users of this toolkit should keep in mind the interaction between the user, hardware, and software, including:

- What is required of the user to be able to access and use, including to understand, the information technologies that create and convey messages? For example, is your information about this in plain language?
- Who are the users you are communicating with? Users can include: users of screen readers (or other text-to-speech software), screen magnifiers, literacy software solutions, speech recognition software, software for colour-blindness, and keyboard only or head-control users.
- What is the best format for you to convey your message? In deciding what to use, have you considered the different strengths between formats? For example, Microsoft Office documents (Word, Excel, and PowerPoint) versus PDFs, videos, and EPUBs; cloud or web-based operating systems versus local or on-site storage and access.
- Should you use multiple formats to communicate your message so that you can leverage the strengths of each to reach as wide an audience as possible?

### **Consider the context: an example**

A CBM partner has been funded to create a video on hand-washing. This video is primarily intended for deaf people who use their respective national sign languages in English speaking countries. What factors would need to be considered? What accessibility features could be leveraged to ensure that the video is accessible and usable for the primary target audience?

Awareness of assistive technologies and digital accessibility standards is a central responsibility for people producing digital resources. Equally as important is training in the use of assistive technologies: both for people to appropriately use these tools when producing accessible content and for users.

### 2.4.2 Benefits for society and business

Accessible ICT means that everyday technology, including digital content, is usable for a wide audience. Digital inclusion benefits everyone to participate on a more equal basis and to contribute to the economic, social, cultural, and political lives of their societies. As this case study on the importance of accessible technology in humanitarian action shows, it can facilitate persons with disabilities and other groups in society, for example older populations, to access and share information, and to both provide and receive support in a crisis situation.

#### The importance of accessible technology in humanitarian action

From early warning systems to resilient infrastructure, technology is playing an increasingly important role at all stages of disaster risk reduction (DRR) and emergency response. Recognising this, CBM has developed an accessible smartphone app – “[Humanitarian Hands-on Tool](#)” – which provides step-by-step guidance on how to design and implement an inclusive emergency response<sup>44</sup>. Ensuring that technology used in humanitarian action is developed in an accessible way will mean that persons with disabilities can fully participate in DRR measures and emergency responses.

Before a disaster occurs, technology enables us to plan responses appropriate to the area. It allows us to map the most at-risk families, and enhances the planning of evacuation routes and emergency shelters.

When responding to emergencies, technology is again invaluable across all types of warning systems and to facilitate fast and efficient responses, with social media being used as a way to exchange information and as a tool to mobilise and coordinate people.

In the aftermath of a disaster, technology enables us to build more resilient homes and community infrastructures, to transfer cash to where it is needed, and although the use of drones is in its infancy, its potential is clear.<sup>45</sup>

## 2.4 ICT and inclusion

From a business perspective, ICT accessibility features also improve the comfort of the work environment and increase productivity for employees. For employers, having accessible products and services available in their workplaces can increase their pool of potential employees and invite a more diverse workforce. A 2010 report by the OneVoice Coalition for Accessible ICT states that organisations can attain six key business goals by investing in accessible and usable ICT<sup>46</sup>:

- Reach new markets.
- Maximise employee engagement and productivity.
- Provide high quality products and services.
- Improve supply chain management.
- Build partner and community relations.
- Minimise risk of legal action.

### 2.4.3 Accessibility and usability

Resources like this toolkit help ensure that persons with disabilities can use and understand digital content and communications on an equitable basis as those without a disability. Given this, users of this toolkit should distinguish and consider **accessibility** and **usability** when creating digital items.

Accessibility can be measured by comparing how well a product or service can be used by someone with a disability and by someone without a disability. In technology, accessibility features are intended to reduce that gap. The effectiveness of an accessibility feature can be measured by asking: does this feature increase the number of people who can independently use this product or service? If the answer is yes, then the accessibility of the product or service has improved.

Usability examines how easily something can be used by a specific group of people. While an accessibility feature may have good usability for one group of people, it may differ significantly for another group of people.

### Accessibility versus usability: an example

Returning to the hand-washing video, the accessibility of the hand-washing video will improve by including captions in English and if appropriate, an embedded video with international sign, as more people, overall, will be able to understand this video. By doing so, the usability of the video for people who are deaf or hard of hearing will also improve. Additionally, captions can be very useful for people for whom English is not their primary language. It is always good practice to supply a link to the transcript of the captioning with the video so that the content can also be accessible to people with vision impairment that use English. However, the usability of this hand-washing video would be very low if the video is supposed to target a group of people who only speak French or Spanish.

# 7 facts about digital accessibility

You don't have to be an IT expert to make digital accessibility happen

**1 billion disabled people globally (15% of the world population) have limited access to the internet.**

Barriers include: the cost of hardware, software, or broadband; a lack of skills or training; the need for assistive technology; a lack of accessibility policies to facilitate access to the internet.



**And when they get online, only 40% of CRPD countries have accessible government websites that facilitate access to services for persons with disabilities.**

The top 10 commercial and news media websites are accessible in only 18% of CRPD countries.

**The most common accessibility errors include missing alternative text for images, poor colour contrast, and making important information hard to find.**



**Most problems are easy to fix and relatively cheap.**

Make use of free online evaluation tools; consult with persons with disabilities; and conduct usability testing with a diverse group of participants to understand what the problems are.



**Listen to users.**

Users have clear expectations about their needs and preferences, and what they like and what they want to avoid – like CAPTCHA verifications. Check in with users on a regular basis to ensure that accessibility is maintained over time.



**Creating accessible documents is easy.**

Larger fonts and left aligned text are easier to read; busy layouts and dense text are difficult to read; clear structure in web pages and documents makes them easier to navigate; images should include descriptive alternative text; and language should be simple.

**Start with good design.**

Considering and including accessibility from the beginning is cheap and essential to avoid procurement and design mistakes. Good design simply makes sense and benefits everyone.



## Section 3

# Tools and guidance for creating accessible content

In this section, we focus on both the content and the tools that are available to produce accessible content. The guidance in this section is recommended for all printed and electronic communication including text documents, emails, websites, and any other kind of digital communication material. Special requirements apply to some formats, which are explained further below.

# 3.1 Fonts

## Key points

- Current research shows no overall difference in the readability between fonts with flourishes (Serif) and simple fonts (Sans-serif)<sup>47</sup>, but font choice can improve or worsen the readability of a document for an individual.
- Offering a choice of fonts and font size is crucial when considering the differing needs and preferences of users. For example, someone with dyslexia may require a certain font for readability while someone else with low vision may require a certain font size for equitable readability.
- Examples of Serif fonts in 12-point size: Times New Roman, Garamond, Cambria.
- Examples of Sans-serif fonts in 12-point size: Verdana, Tahoma, Calibri.

## Testing font accessibility

A font is considered more accessible if it is easy to distinguish between similar characters such as:

**Z** and **2**

**S** and **5**

**I, l** and **1** (I, L and One)

A font is considered accessible if there is sufficient spacing between letters in a word, such as:

**m** and **rn**

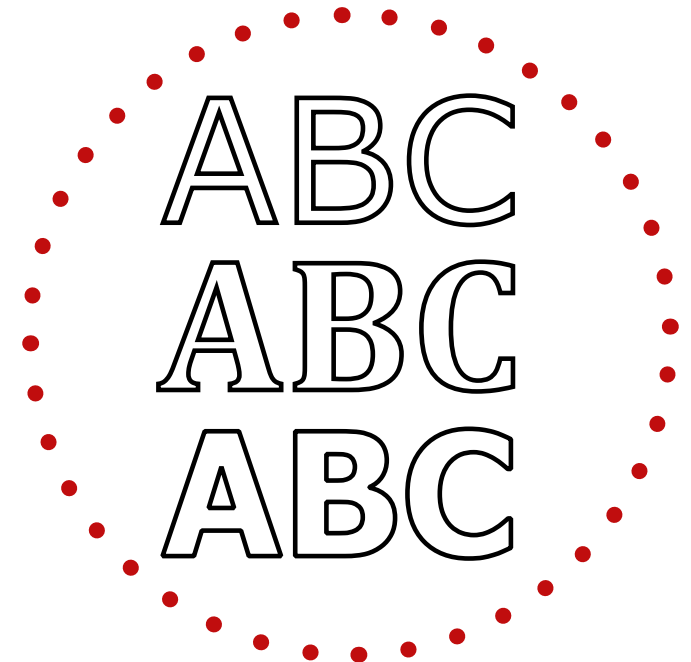
**oa** and **oo**

**cl** and **d**

## + Resources

### Accessible fonts

[WebAIM](#): font readability<sup>48</sup>





## 3.2 Language and Easy Read

### Key points

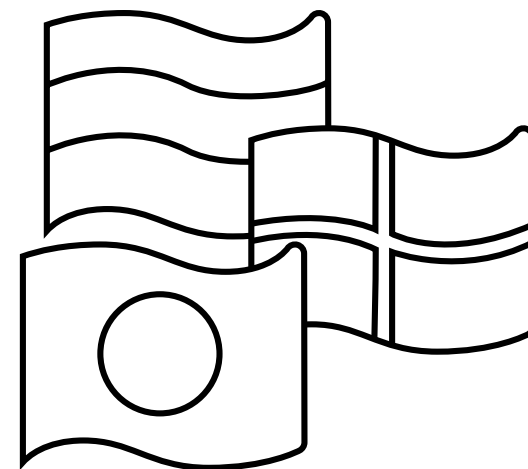
- When providing information to the general public, the message should be relayed in the simplest language possible. This concise, clear communication method is defined as “Plain Language”.
- Plain language allows the target audience to quickly **identify** the message, **understand** the message, and **use** the message.
- Easy Read is a format of creating documents to make a message easily understandable and makes use of plain language.

### + Resources

#### Plain language and Easy Read

Organisations like the [Plain English Campaign](#) provide a paid service to check publications and websites to ensure that the language used is understandable<sup>49</sup>. They also provide free guides on writing in Plain English. Similar services exist in other countries, for their respective languages.

[Change](#)<sup>50</sup> is a human rights organisation led by disabled people which provides free resources and paid services to create bespoke accessible information in easy read and video formats. Their guide on [How to Make Information Accessible](#), contains detailed, practical advice on preparing easy read documents, including advice on making the writing accessible and selecting picture<sup>51</sup>.



## 3.3 Structuring content to be accessible

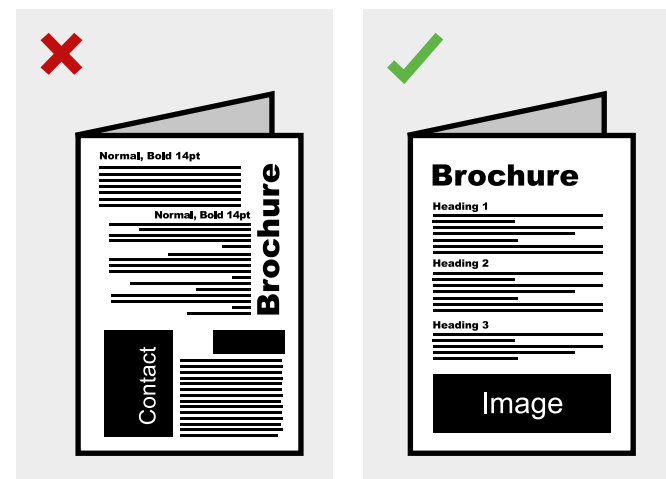
### Key tips to follow when creating text documents

#### Avoid:

- ✗ writing large sections of text in “all-caps” (all capital letters).
- ✗ putting valuable information in headers and footers as screen readers will ignore them.
- ✗ underlining large blocks of text as it reduces readability.
- ✗ hyphenating words that are usually not split (for example “continua-tion” should not be hyphenated, but hyphenating “editor-in-chief” is fine).
- ✗ footnotes. With the exception of the EPUB 3 format, footnotes are difficult to make accessible. Minimise their use.

#### Do:

- ✓ use headings and sub-headings.
- ✓ keep sections short.
- ✓ provide summaries for tables.
- ✓ provide a glossary of terms to aid understanding of technical words and acronyms.
- ✓ explain the full name of an abbreviation or acronym when it first occurs.
- ✓ use appropriate font size, a font size of 10 point and smaller is not accessible.
- ✓ keep text left-aligned to keep spaces between words even.
- ✓ use distinct spacing between lines, between paragraphs, and between sections.
- ✓ use bold for strong emphasis.
- ✓ in all instances, underline and embed hyperlinks using appropriate functions in Word or InDesign or the links may not work if exported to a PDF.
- ✓ use concise, but descriptive, hyperlink text.
- ✓ use appropriate alt text for all images and tables.
- ✓ use accessible text and background colour.



### 3.3 Structuring content to be accessible

#### Additional key points when creating tables, spreadsheets, and graphs

Tables should only be used to present data; they should not be used to control page layout.

#### Avoid:

- ✗ empty rows/columns using blank lines for visual formatting purposes.
- ✗ using columns of empty table cells.
- ✗ merging cells.

#### Do:

- ✓ give each spreadsheet tab a meaningful name.
- ✓ name rows and columns in tables.
- ✓ use appropriate description and alt text for all images and tables.
- ✓ adjust column widths and row heights.
- ✓ use simple table structures.

#### Bad examples of tables. Avoid:

- ✗ Use of table to create/control page layout, including web page (also, no headings or alternative text).
- ✗ Simple table design but without headings or alternative text it is not clear.

#### Good example of a simple table design with headings and alternative text. Do:

Font family – generic	Font family – name	Example in 12-point size
Serif	Times New Roman	Times New Roman
Serif	Garamond	Garamond
Sans-serif	Verdana	Verdana
Sans-serif	Calibri	Calibri

**Alt text:** This table comprises three columns setting out two generic font families (serif and sans-serif), two font family names associated with each generic family, and an example of that font in 12-point size.

#### + Resources

#### Structuring content to be accessible

Web Accessibility Initiative, [web accessibility tutorials](#)<sup>52</sup>.

[Section 3.7](#) of this toolkit has further information about creating accessible content in Word, Excel, PowerPoint and PDF documents.

## 3.4 Colour: contrast and graphics

### Key points

- Ensure that colours for the text, graphics, and the background have sufficient contrast when viewed by someone with colour-blindness or when viewed on a black and white screen.
- Be particularly mindful when choosing colours for graphs and charts.

### + Resources

#### Colour and graphics

[Colour contrast analyser](#) by the Paciello Group. Versions for Windows and Mac OSX are available for download.<sup>53</sup>

[Colour contrast checker](#) by Snook.ca. Colour codes must be manually entered for analysis.<sup>54</sup>

[Color Oracle](#) is an excellent, free, and easy-to-use colour blindness simulator.<sup>55</sup>

Penn State University provides some [guidelines on how to make charts more accessible](#)<sup>56</sup>. This includes advice on both drafting text alternatives and colour considerations.

Ontario University provides [general guidelines for describing graphics](#)<sup>57</sup>.

[PennState website \(colour and contrast on web pages\)](#)<sup>58</sup>.

[W3C Working group note: understanding WCAG 2.0, contrast](#).<sup>59</sup>

WebAIM, including a [contrast checker](#)<sup>60</sup>.



# 3.5 Alternative text

## Key points

- Alternative text, or alt text, should be provided for all non-text elements, such as graphs, pictures, tables, images, logos, links, and any other form of graphic information.
- Alt text concisely describes what is shown in the graphic.
- Alt text will not automatically show in a document but will show when mousing over the image or if using screen readers.
- Alt text should avoid beginning with "picture of" or "image of".
- Alt text can be added in HTML using a description tag.
- Twitter: alt text of up to 420 characters can be added to images embedded in Tweets.

Even where an image has a caption, using alt text is best practice.

### Alt text: example



A group of people with and without disabilities sat at the entrance to a building laughing while they pose.

## + Resources

### Alt text

[Jim Thatcher: alt text](#)<sup>61</sup>.

[WebAIM: alternative text](#)<sup>62</sup>.

[Altformat.org](#): accessible text for learning<sup>63</sup>.

The Diagram Center [Image Description Guidelines](#)<sup>64</sup>.

[Making images accessible for people on Twitter](#)<sup>65</sup>.

## 3.6 Creating accessible video

### Key points

- Captions (also referred to as subtitles) for videos improve access to content for people who have hearing impairments.
- Captioning converts the audio dialogue of a video into text and displays the text in time with the audio.
- Non-dialogue captions, such as speaker identifications, sound effects, and music descriptions are written in square brackets to differentiate them from the dialogue.
- Captioning can be created manually or be auto-generated.
- Captions can be downloaded from one platform (like YouTube) as an .srt file and reused in another platform that accepts .srt files (like Facebook).
- A sign language translation/interpretation track is useful for people who are deaf and use sign as their primary language.

### + Resources

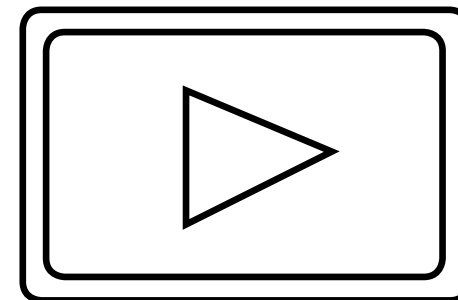
#### Captioning, transcribing, and editing

[Captioning YouTube Videos](#) is a tutorial from The National Center on Disability and Access to Education (NCDAAE) on the different ways to caption YouTube videos<sup>66</sup>. Please note that the tutorial itself is not fully accessible.

Facebook also now gives users an option to automatically [add closed captions to their videos](#)<sup>67</sup> or to upload an .srt file.

In addition to captioning videos, it may be helpful to provide a non-synchronised text transcript in a separate file. [This tutorial](#) describes how to create free automated **transcripts for both Mac and Windows**<sup>68</sup>.

The DCMP (Described and Captioned Media Program) [Captioning Key](#) provides tips and advice on editing captions<sup>69</sup>.



## 3.7 Creating accessible content

### 3.7.1 Microsoft Word

#### Key points

- Include alternative text with all visuals and tables.
- Add meaningful hyperlink text and ScreenTips.
- Ensure that colour is not the only means of conveying information.
- Use sufficient contrast for text and background colours.
- Use built-in headings and styles.
- The core accessibility features of Microsoft Word are present in all Windows versions as far back as Word 2003.
- Test documents with the built-in accessibility checker. The Word accessibility checker tool can automatically check the accessibility of your document, but it is available only in Word 2013 onwards.
- Word for Mac lags behind the Windows version in terms of accessibility support. To avoid version issues, the .docx format should not be used in Word 2007 and 2010. Instead, use .doc format (Word 1997 – 2003 format).

#### + Resources

##### Microsoft Word

The [Microsoft accessibility website](#)<sup>70</sup> provides help pages and tips for creating accessible documents using accessibility features, including the [Microsoft guide on how to use the accessibility checker tool](#)<sup>71</sup>.

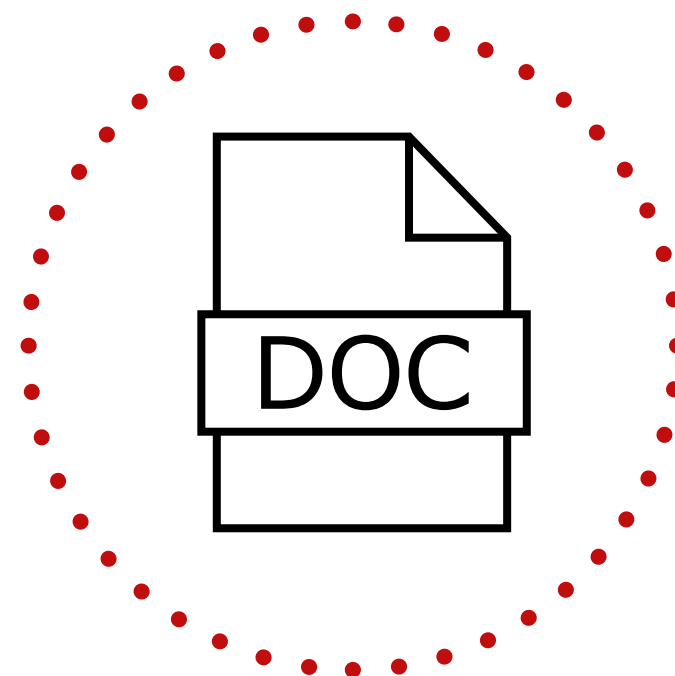
Be aware of the [limitations of accessibility checkers](#)<sup>72</sup>.

Microsoft has [a step-by-step tutorial for Word](#)<sup>73</sup> that includes guidance for Windows versions 2013 and 2016; Mac version 2016; and Word for iOS, Android, Word online, and the Windows 10 app.

The NCDAE [Microsoft Word one-page cheat sheets](#)<sup>74</sup>.

The [PDF Accessible website](#) (pertains to PDFs generated from Word documents)<sup>75</sup>.

[Adobe Acrobat X Best Practices for PDF Accessibility \(PDF 6.42MB\)](#)<sup>76</sup> (pages 79 to 87; pertains to PDFs generated from Word documents).



## 3.7 Creating accessible content

### 3.7.2 Microsoft Excel

#### Key points

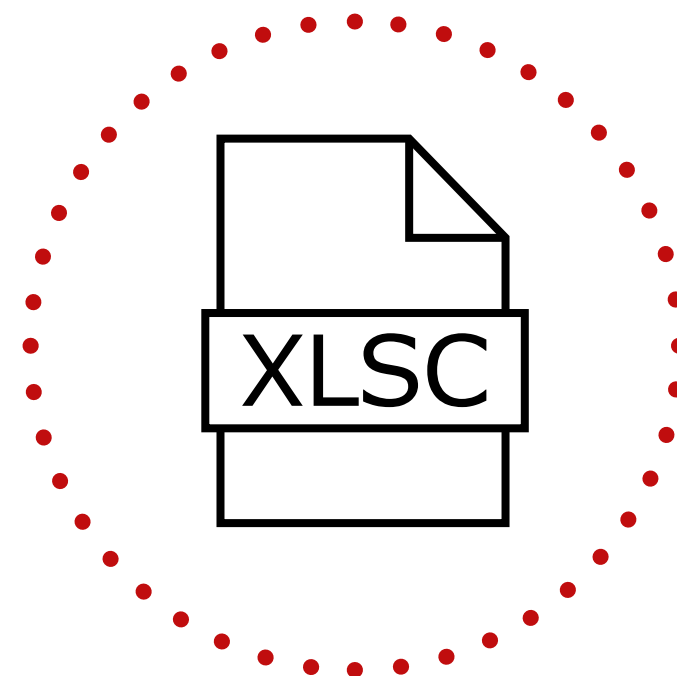
- Include alternative text with all visuals and tables. Alt text for images and tables are not available for Excel 2007 and earlier in Windows and not available in iOS/Mac.
- Add meaningful hyperlink text and ScreenTips. For instance, instead of using ambiguous link text such as 'click here' or 'read more', include the full title of the destination page. You can also add ScreenTips that appear when your cursor hovers over a cell that includes a hyperlink.
- Give all sheet tabs unique names, and remove blank sheets.
- Use a simple table structure, and specify column header information.
- Test documents with the accessibility checker (Windows/Mac).

#### + Resources

##### Excel

Article: "[Make your Excel spreadsheets accessible](#)"<sup>77</sup> applicable to Excel 2010, 2013, 2016 in Windows; Excel 2016 on Mac; iOS, Android, and Excel online.

[Excel cheat sheet](#)<sup>78</sup> from the NCDAAE for documents created with Windows Excel 2010/2013 or Mac Excel 2011.





## 3.7 Creating accessible content

### 3.7.3 Microsoft PowerPoint

#### Key points for building PowerPoint decks

- Use built-in templates.
- Give each slide a unique title.
- Do not fill the slide with text.
- Use 18-point font or larger.
- Ensure correct reading order of slides.
- Provide captions for videos.
- Test document with the accessibility checker (Windows/Mac).

#### + Resources

##### PowerPoint decks

Microsoft: [accessibility support guide for PowerPoint 2016](#)<sup>79</sup>.

WebAIM: [PowerPoint Accessibility](#)<sup>80</sup>.

NCDAAE: [Microsoft PowerPoint one-page cheat sheets](#)<sup>81</sup>.

#### Key points for presenting PowerPoint decks

- Speak slowly and clearly.
- Ensure that all important information is read out and that all graphs are explained orally.
- Face the audience when speaking. People who lip read cannot understand spoken information if the speaker is facing away from them.
- If possible, record presentations on video and audio and provide captioned versions and transcripts via the web. Alternatively, slide decks can be narrated and recorded in PowerPoint, saved as a video, and then uploaded to YouTube or any other platform where it can be manually or automatically captioned.
- Where possible, provide a translator for sign language or tactile signing.

## 3.7 Creating accessible content

### 3.7.4 Adobe InDesign

#### Key points

- InDesign is Adobe's page layout programme. It is typically used by graphic designers to create things like brochures.
- The accessibility features are very good but not widely known.
- There is a steep learning curve with InDesign compared to Word and training will likely be required.

#### + Resources

##### InDesign: accessibility tips and tutorials

Microsoft: [PDF Accessible website](#)<sup>82</sup>.

The [Accessible Digital Documents Company \(ADD\) blog](#)<sup>83</sup>.

The NCDAE [Adobe InDesign CS5.5 one-page cheat sheet](#)<sup>84</sup>.

### 3.7.5 PDF

#### Key points

- Reduce or eliminate the need for additional work in the final PDF by creating accessible source documents (in Word or InDesign) before exporting to PDF. The accessibility features are very good but not widely known.
- Adobe Acrobat versions 11 and later have a built-in accessibility checker.

#### + Resources

##### PDFs: accessible publications and tagging documents

An alternative free downloadable checker is [PAC](#)<sup>85</sup>. PAC is particularly useful if you are working to the [PDF/UA](#) PDF accessibility standard<sup>86</sup>. It is important to note that until a sufficient number of assistive technologies are compliant with this standard, PDF/UA-compliant PDFs may not be fully accessible.

The [Adobe Acrobat XI Best Practices for PDF Accessibility](#)<sup>87</sup> is a useful resource to resolve issues in checking PDF accessibility.

[WebAIM techniques for accessible PDFs](#)<sup>88</sup>.

The [PDF Accessible website](#)<sup>89</sup>.

The [Accessible Digital Documents Company blog](#)<sup>90</sup>.

["How To Make Information Accessible", a guide to producing easy read documents by Change](#)<sup>91</sup>

## 3.7 Creating accessible content

### 3.7.6 EPUB and Kindle

#### Key points

- The EPUB format is frequently used to store and transport ebooks for eReader technology (such as Kindle and Kobo) but can also be read by applications built for tablets and smartphones.
- Applications usually also read PDFs and other ebook formats.
- Devices may also have built-in or add-on applications that can be activated or installed to provide text-to-speech functions.
- The EPUB format allows for more text customisation than a PDF, allowing the user to easily select and change fonts and font size for readability.
- EPUB works for almost all content types except for tables.
- Adobe InDesign is most commonly used to create EPUB documents.

#### + Resources

##### EPUBs

The Daisy Consortium provides a guide to the essentials of [Using Adobe InDesign to create accessible EPUB 3 files](#)<sup>92</sup>.

[EPUB 3 accessibility guidelines](#)<sup>93</sup>.

Matt Garrish, [Accessible EPUB 3](#) (free ebook)<sup>94</sup>.

The Diagram Center [Top Tips for Creating Accessible EPUB 3 Files](#)<sup>95</sup>.

### 3.7.7 Email

#### Key points

- Internet connections in some places may not be good enough to receive large emails and the cost of internet may be high.
- Downsize attachments by compressing them using compressed (zipped) folders feature.
- Use short sentences with a clear question or message.
- Use appropriate punctuation.
- Insert alt text for graphics.

#### + Resources

##### Email

[Making email accessible](#)<sup>96</sup>.

[Make your Outlook email accessible](#)<sup>97</sup>.

## 3.7 Creating accessible content

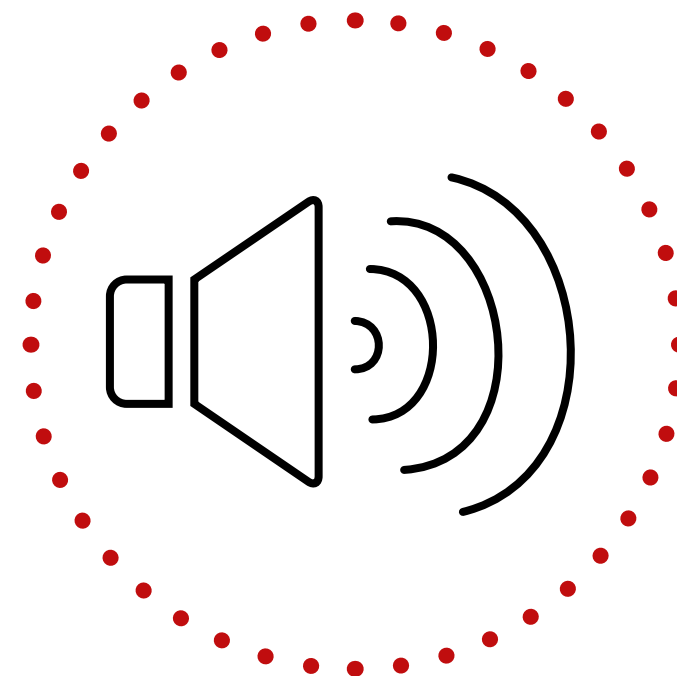
### 3.7.8 Alternative formats

#### Alternative formats for people who have difficulty reading or cannot read standard print include:

- **Large print:** Documents using a font size of 14-points or larger.
- **Braille:** Braille is a tactile writing system using patterns of raised dots to represent letters. A refreshable Braille display can be used by Braille users to read computer screens. There are three grades of Braille (1, 2, and 3).
- **Tactile diagrams:** These are graphs, diagrams, or other pictorial information that are reproduced using raised patterns. Diagrams may need to be simplified or altered before being produced and the diagram is often accompanied by explanations in Braille.
- **Audio versions:** These include cassette tape recordings, digital audio in MP3 format, audio streams, or a screen reader. Audio recordings of large events, such as speeches at conferences and classroom lectures, may need accompanying transcripts to filter irrelevant audio.

- **DAISY (Digital Accessible Information SYstems) talking books:** To play DAISY books, you will need to install a DAISY-compatible player. Examples include: AMIS for Windows, Android Daisy EPUB Reader, Daisy Delight for Mac, DaisyWorm for iOS, and Victor Reader Stream. The viability of this format may be in danger due to the growing popularity of sites like Audible.
- **Less common alt formats:** Include “**Moon**” (raised, embossed shapes on paper) and “**Giant Print**” which refers to print sizes larger than 18-point font.

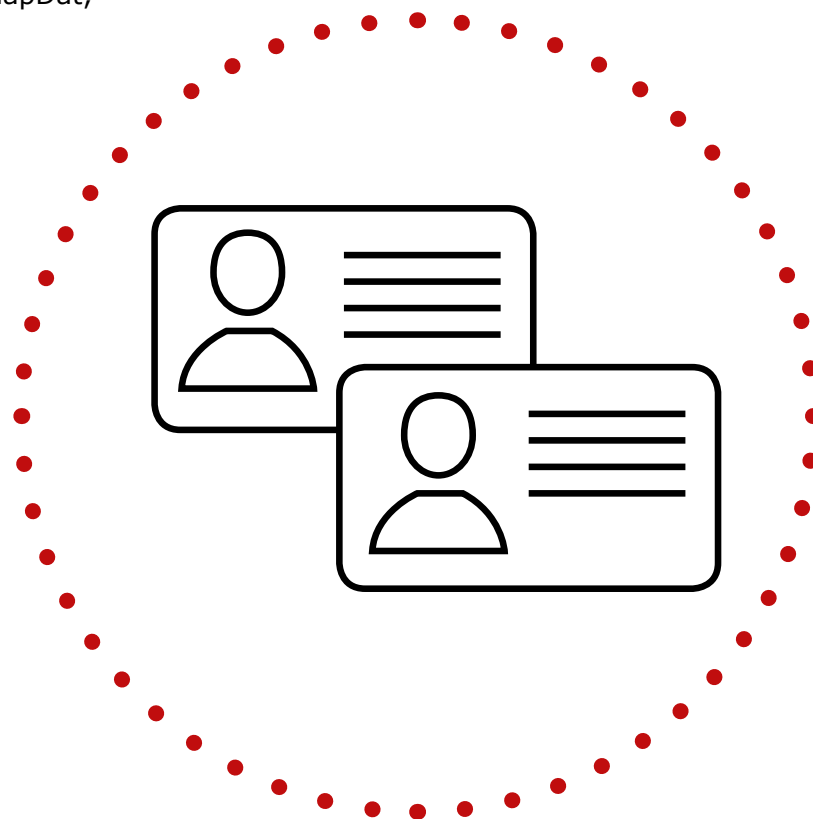
The term alternative format (or alt format) can also mean converting from one type of file format, such as PDF, to another format, such as Word or HTML.



## 3.8 Business cards

### Key points

- Use the ISO standards most used in the national or international context (for example, 85mm x 55mm is most common in Europe).
- Use 12- to 14-point font size.
- Avoid using too many different colours and ensure sufficient colour contrast. Ensure that the colours are appropriate for the cultural context.
- Emboss the logo in Braille on the printed card or on a blank flap. Grade 2 Braille is preferred. As Braille text is larger than printed text, the Braille text may need to be shortened, but do not just emboss a name. Include the company and contact information.
- Ensure the basics are included (listed here in priority): name, company, phone number(s), email, title, address, website.
- Think of using your digital business cards. It is becoming more popular as they can be generated and sent through Microsoft Outlook, and applications such as SnapDat, OneCard, and Haystack.



## Section 4

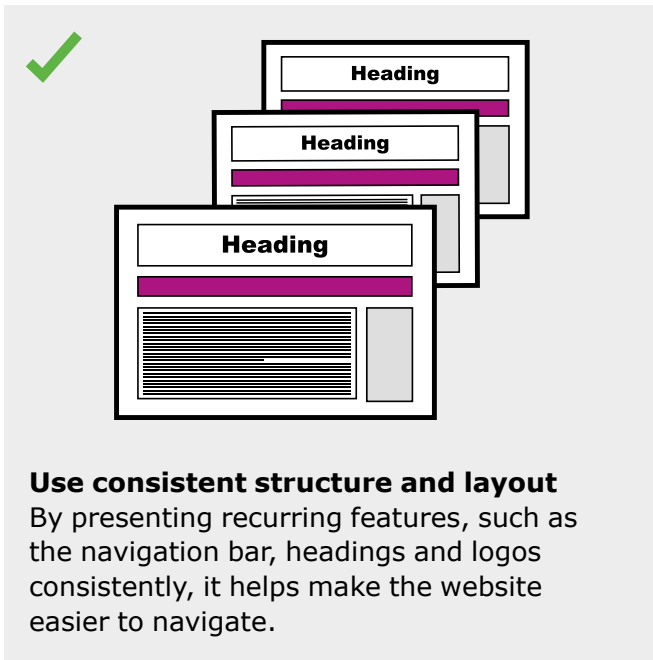
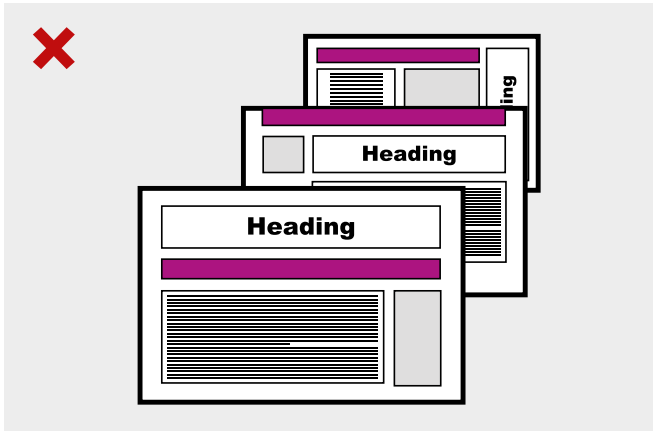
# Web accessibility

Keeping in mind that CBM recognises and promotes adherence to what is currently (as of November 2017) the most commonly accepted standard (WCAG 2.0), this section highlights resources to build an accessible website and to assess the accessibility of a website.

# 4.1 Building an accessible website

## Key points

- All navigation should be fully accessible through the keyboard.
- Be consistent with navigation layout.
- Navigation bars should be easy to identify and distinguish.
- Navigation bars should provide feedback.
- Make webpages appear and operate in predictable ways.
- Avoid the use of pop-ups.



**Use consistent structure and layout**  
By presenting recurring features, such as the navigation bar, headings and logos consistently, it helps make the website easier to navigate.

## + Resources

### Build an accessible website

Web Accessibility Initiative, [Tips for Getting Started with Web Accessibility](#)<sup>98</sup>.

Google has developed an online course, ["Introduction to Web Accessibility"](#)<sup>99</sup>. This course introduces tools and techniques for web developers to ensure that websites are more accessible to users who are blind or have low vision.

WordPress is a free online blogging and website platform that provides templates and guidance. The WordPress Accessibility team has developed [a quick start guide](#)<sup>100</sup> on making an accessible website.

## 4.2 Tools to check website accessibility

### Key points

- Website accessibility checkers are useful but have their limitations.
- The checkers will sometime identify a logo without alt text as a problem when it is not (i.e. a false positive) or fail to pick up on a heading that was marked as a normal paragraph (i.e. a false negative).

### + Resources

#### Website accessibility

[AChecker](#)<sup>101</sup> checks whether a single HTML page conforms with accessibility standards or not.

[WAVE](#)<sup>102</sup> also evaluates the accessibility of websites in relation to accessibility standards.

[SortSite](#)<sup>103</sup> checks websites against multiple accessibility standards.

[The W3C website](#)<sup>104</sup> has a more comprehensive list of web accessibility evaluation tools.

The WAI [Accessibility Evaluation Resources](#)<sup>105</sup> page also provides a comprehensive list of resources to assist in the evaluation website accessibility, from [Easy Checks](#)<sup>106</sup> to [Using Combined Expertise to Evaluate Web Accessibility](#)<sup>107</sup>.

[WCAG 2.0](#)<sup>108</sup>.

The United State Access Board, [Section 508 Rehabilitation Act](#)<sup>109</sup>.

W3C [Web Accessibility Initiative \(WAI\)](#)<sup>110</sup>.

[Web style guide](#)<sup>111</sup>.

[Nielsen Norman Group](#)<sup>112</sup>.



## 4.3 Conference calls

### Key points

- Conference calling technology like Skype, GoToMeeting, and WebEx usually have several components: the video interaction, the audio call, and the text chat where items and messages can be posted.
- People with visual impairments may not be able to fully access conference call functions without the use of accessibility features and accommodations.
- In your invitation make sure to ask people if they have any accessibility support requests, needs, and preferences.
- Consider accessibility features including live captioning, sign language interpretation, and general accessibility guidance tips.
- At the start of the call, request the audience not to speak too fast and to state their name each time before they speak.
- Speak at a steady pace and close to the microphone, and try to reduce any background noises.
- Avoid complex language or acronyms.
- Describe the key content of all slides, especially if they contain graphics, and state when you are moving on to a new slide.
- Monitor the chat room for any input from participants and repeat it verbally so it is accessible for all.
- Follow up with a presentation or meeting minutes sent by email in accessible format.

### + Resources

#### Conference calls

[Accessible webinars – making online work for everyone](#)<sup>113</sup>.

[Citrix – GTM User Manual](#)<sup>114</sup>.

[Citrix – GTM FAQs](#)<sup>115</sup>.

[Citrix – GTM customer support](#)<sup>116</sup>.

Companies like AI (Access Innovation) media provide live captions, transcripts, closed captions, and audio description. More information is available on [AI media website](#)<sup>117</sup>.

## 4.4 Online forms

### Key points

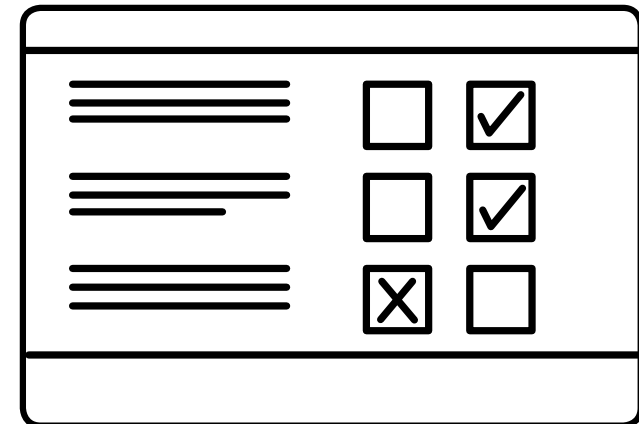
- Forms must be properly structured and optimised to support the person in completing the form without errors.
- Even if your online form is accessible, be prepared to have the form available in an accessible Word document in case users experience difficulties with accessing and using the Internet.

### + Resources

#### Online forms

[Customer Communications Toolkit for the Public Service – A universal design approach](#)<sup>118</sup>.

[A Step-by-Step Guide to Creating More Accessible Surveys](#)<sup>119</sup>.



The illustration shows a rectangular window representing a web form. On the left side, there are three rows of horizontal lines representing text input fields. To the right of these fields is a column of three checkboxes. The top two checkboxes are empty, and the bottom one contains an 'X'. To the right of this column is another column of three checkboxes. The top two checkboxes contain checkmarks, and the bottom one is empty. The entire form is enclosed in a black border.

## 4.5 CAPTCHAs

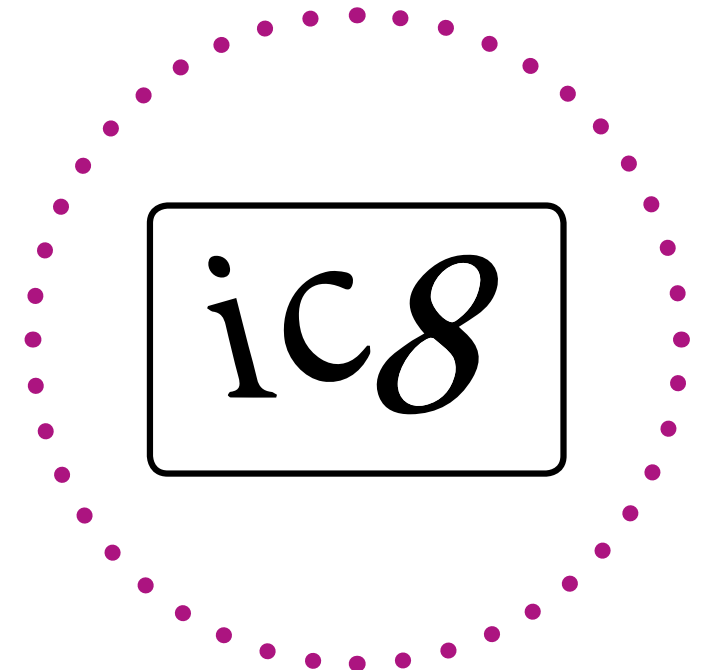
### Key points

- Where possible, avoid the use of CAPTCHAs.
- Where anti-spam measures must be adopted in forms, use World Wide Web Consortium (W3C) techniques to allow CAPTCHAs to be accessible. This typically requires providing the CAPTCHA test in more than one format (for example, visual and auditory versions) and providing a text alternative that describes these formats.

### + Resources

#### CAPTCHAs

The World Wide Web Consortium (W3C) provides information on the "[inaccessibility of CAPTCHA: alternatives to visual Turing tests on the web](#)"<sup>120</sup>.



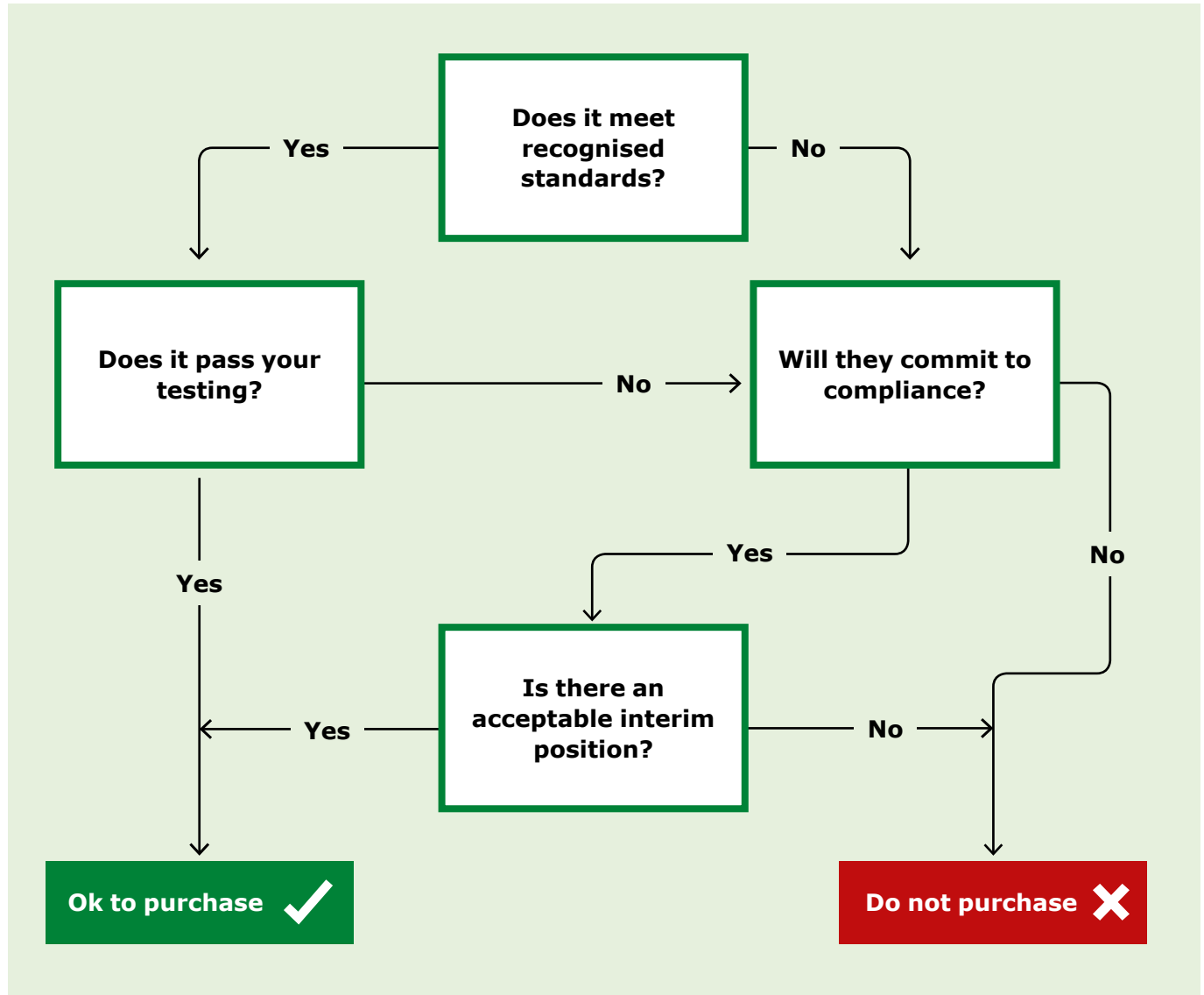
## Section 5

# Procurement

# 5.1 A screening tool: to procure or not to procure?

## Key points

- The procurement process can be time-intensive, expensive, and confusing. This screening tool uses four questions to allow you to make a quick assessment of a potential product and vendor.



## 5.2 Process considerations

### Key points

- Become familiar with ICT accessibility standards using the hyperlinks in this toolkit.
- Reach out to industry experts and civil society when necessary.
- Build accessibility requirements into each step of the procurement process.

## 5 steps to building accessibility into the procurement process

**1. Call for offers:** When asking vendors to submit an offer for what is needed, specify accessibility targets and make accessibility an explicit factor in the award criteria.

**2. When assessing vendors, ask:** Does previous work include universal design principles? Does previous work demonstrate compliance with relevant guidelines? What were the results of accessibility audits and user testing for existing products? Are the required processes to use the product inclusive? Remember to group all accessibility criteria together.

**3. User-centred development and implementation:** Capture user needs, complete user testing, and make sure the product is sufficiently agile. If an existing accessibility feature will be compromised, ensure the new product can fulfil that need.

**4. Evaluate the deliverable:** Use independent evaluators and ensure the evaluation captures usability as well as technical accessibility against standards. Don't just use automated checkers. Formal user testing and human accessibility experts will yield the best results.

**5. Maintain accessibility:** Organisational needs, end users, user needs, product use, and standards and technology may change so regularly review accessibility. Consider the type of support and training needed and include accessibility in training.

## 5.3 Other considerations

### Key points

- Consider if an existing product might have positive, unintended functionalities that meet a need. An example is video conferencing software and apps that were intended for scheduling and telecommuting (working remotely) but are also useful for people who communicate through sign language. This exemplifies the benefit of ongoing accessibility reviews.
- Informally or formally share lessons learned through a community of practice. This can help identify reliable vendors and establish and share best practices in procurement and evaluation.

### + Resources

#### Procurement resources and tools

The National Disability Authority (NDA) provides detailed advice on the [five stages of IT procurement](#).<sup>121</sup>

The [CEN website](#)<sup>122</sup> identifies tools for writing a call for tenders, evaluating tenders, and deliverables for accessible ICT purchases. This website, based on European Standard EN 301 549, can automatically generate the accessibility requirements for the most common technologies including websites and applications.

The Voluntary Product Accessibility Templates (VPATs): VPATs have a standard format that can serve as a basic reference to evaluate ICT products and services. More information is available on the [Information Technology Industry Council \(ITIC\) website](#)<sup>123</sup>.

IT accessibility expert Jeff Kline's 10 steps for determining where and when accessibility can be infused<sup>124</sup>: [PEAT "Accessibility Technology: It Starts with Procurement" web page](#).

Processes used by some American universities to incorporate accessibility into their procurement processes: [NCDAA procurement article](#)<sup>125</sup>.

The Washington University's accessible ICT procurement statement: [Washington University accessible technology website](#)<sup>126</sup>.

Information about the assessment, access, and acquisition of assistive technologies can be found on the [AMAC Accessibility Solutions and Research Center website](#)<sup>127</sup>.

Manufacturer's accessibility websites that highlight product accessibility features:

[Microsoft: Accessibility](#)<sup>128</sup>.

[Google: Accessibility, Products, and Features](#)<sup>129</sup>.

[Google: Android accessibility](#)<sup>130</sup>.

[Apple: Accessibility](#)<sup>131</sup>.

[Apple iOS accessibility support](#)<sup>132</sup>.

## Section 6

# Self-learning resources



## 6.1 Digital accessibility initiatives around the world

- **International Telecommunications Union (ITU):** The ITU is the UN specialist agency for information and communications technologies. It is a worldwide reference for this industry and one of their most important concerns is ICT accessibility. More information on the [ITU website](#)<sup>133</sup>.
- **Global Initiative for Inclusive Information and Communication Technologies (G3ict):** Launched in December 2006 by the United Nations Global Alliance for ICT and Development, in cooperation with the Secretariat for the Convention on the Rights of Persons with Disabilities (CRPD) at UN DESA, G3ict is an advocacy initiative. Its mission is to facilitate and support the full implementation of ICT accessibility and assistive technologies as set out in the CRPD.<sup>134</sup> More information on the [G3ict website](#)<sup>135</sup>.
- **International Association of Accessibility Professionals (IAAP):** The mission of the IAAP is to define, promote, and improve the accessibility profession globally. It does this through networking, education, and certification to enable the creation of accessible products, content, and services. It shares information with its members about accessibility standards and laws around the world, and provides them with updated accessibility training. More information on the [IAAP website](#)<sup>136</sup>.
- **E-accessibility toolkit:** This is a joint initiative of ITU and G3ict. It contains online resources for policy makers implementing the CRPD. Within this toolkit, you will find information about e-accessibility basics, e-accessibility initiatives around the world, key areas to promote ICT accessibility, and different tools for policy makers. This is a comprehensive and practical reference website. More information on the [e-accessibility toolkit website](#)<sup>137</sup>.
- **GARI project:** Mobile devices and apps accessibility initiative: "Run by the Mobile & Wireless Forum, the Global Accessibility Reporting Initiative (GARI) is a project designed to help consumers learn more about the accessibility features of mobile devices and to help them identify devices with the features that may assist them with their particular needs".<sup>138</sup> More information on the [GARI website](#)<sup>139</sup>.
- **Smart Cities for All:** G3ict and World Enabled launched the Smart Cities for All initiative to define the state of ICT accessibility in Smart Cities worldwide. The objective is to eliminate the digital divide for persons with disabilities and older persons in Smart Cities around the world. More information on [Smart Cities for All website](#)<sup>140</sup>, including the [Smart Cities for All Toolkit](#). The toolkit comprises four tools addressing ICT accessibility and digital inclusion for persons with disabilities and older people.<sup>141</sup>

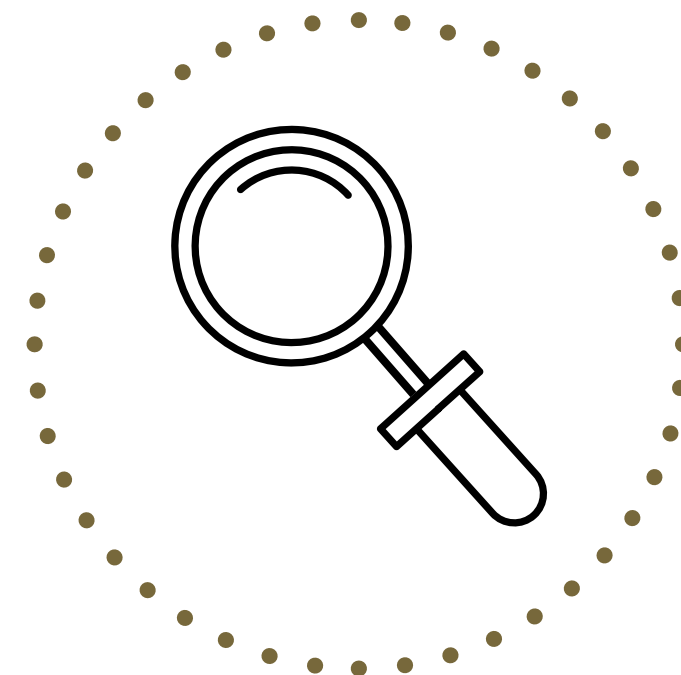
## 6.2 Online courses available in English

- **“Disability Awareness and Support”:**  
Developed by the University of Pittsburgh and delivered through [www.coursera.org](http://www.coursera.org).
- **“Accessibility: Designing and Teaching Courses for All Learners”:** Developed by SUNY Empire State College and delivered through [www.canvas.net](http://www.canvas.net). More information on the [Open SUNY web page](#)<sup>142</sup>.
- **“Information and Communication Technology (ICT) Accessibility”:**  
Developed by Georgia Tech and delivered through [www.edx.org](http://www.edx.org). More information on the [edX Georgia Tech web page](#)<sup>143</sup>.
- **3PlayMedia Webinars** provide a list of recorded and upcoming webinars on different aspects of web accessibility. Webinars are free and available on their [website](#)<sup>144</sup>.



## 6.3 Additional resources and references

- **Syracuse University – “Accessible Technology Toolkit”:** Syracuse University offers this toolkit which brings together multiple resources to learn about and create accessible ICT. More information on the [Syracuse University ITS website](#)<sup>145</sup>.
- **Stanford University – “Stanford Online Accessibility Program” (SOAP):** Based on universal design and web standards compliance, SOAP provides resources for web designers, developers, and content creators to produce materials which are accessible to the broadest audience possible. More information on the [SOAP website](#)<sup>146</sup>.
- **Association of Assistive Technology Act Programs (ATAP):** ATAP has produced several free videos to foster ICT accessibility training. More information on the [ATAP website](#)<sup>147</sup>.
- **Queen’s University, Canada – social media accessibility:** Queen’s University, Canada, has developed a document providing tips on delivering accessible content on social media platforms such as Facebook, Twitter, and YouTube. More information on the [Queen’s University Accessibility Hub website](#)<sup>148</sup>.
- **Texas Governor – accessibility learning modules:** The Texas Governor’s Committee on People with Disabilities hosts learning modules on making Microsoft Office documents accessible to persons with disabilities and understanding assistive technology. More information on the [Office of the Texas Governor’s website](#)<sup>149</sup>.



## Section 7

# Need more help?

If you have a query or would like to get involved in further discussion in digital accessibility, please let us know and feel free to contact CBM's IT Helpdesk:

[helpdesk@cbm.de](mailto:helpdesk@cbm.de)

They will refer you to the right resource or technical support person.

# Endnotes

## Endnotes

- 1** ISO 6385: 2016, <https://www.iso.org/obp/ui/#iso:std:iso:6385:ed-3:v1:en:term:2.4>
- 2** The full web link for the Agile Manifesto is: <http://agilemanifesto.org>
- 3** The full web link for article 2 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-2-definitions.html>
- 4** Lave, J. & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge: Cambridge University Press.
- 5** The full web link for article 1 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-1-purpose.html>
- 6** Adapted from DfID (2000). Disability, poverty and development, poverty and disability – a vicious cycle
- 7** CRPD General comment number 2: <http://www.ohchr.org/EN/HRBodies/CRPD/Pages/GC.aspx>
- 8** United Nations (2006). Convention on the Rights of Persons with Disabilities. Retrieved on 19 April 2017 from: <http://www.ohchr.org/EN/HRBodies/CRPD/Pages/ConventionRightsPersonsWithDisabilities.aspx#2>
- 9** Learnersdictionary.com, 2017. Retrieved on 18 April 2017 from: <http://www.learnersdictionary.com/definition/software>
- 10** International Standard Organisation: <https://www.iso.org/standards.html>
- 11** National Disability Authority (2012). "Centre for Excellence in Universal Design: What is Universal Design". Retrieved on 16 April 2017 from <http://universaldesign.ie/What-is-Universal-Design>
- 12** ISO 6385: 2016
- 13** W3C Web Accessibility Initiative (WAI) (2017). "Introduction to Web Accessibility, Web Accessibility Initiative, W3C". Retrieved on 19 April 2017 from: <https://www.w3.org/WAI/intro/accessibility.php>
- 14** WHO and the World Bank. (2011). World report on disability. Available at this web link: [http://who.int/disabilities/world\\_report/2011/en](http://who.int/disabilities/world_report/2011/en)
- 15** The full web link for article 9 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-9-accessibility.html>
- 16** The full web link for article 21 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-21-freedom-of-expression-and-opinion-and-access-to-information.html>
- 17** The full web link for article 2 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-2-definitions.html>
- 18** The full web link for article 11 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-11-situations-of-risk-and-humanitarian-emergencies.html>
- 19** The full web link for article 19 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-19-living-independently-and-being-included-in-the-community.html>
- 20** The full web link for article 20 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-20-personal-mobility.html>
- 21** The full web link for article 21 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-21-freedom-of-expression-and-opinion-and-access-to-information.html>
- 22** The full web link for article 23 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-23-respect-for-home-and-the-family.html>
- 23** The full web link for article 24 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-24-education.html>

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- 24** The full web link for article 25 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-25-health.html>
- 25** The full web link for article 27 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-27-work-and-employment.html>
- 26** The full web link for article 29 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-29-participation-in-political-and-public-life.html>
- 27** The full web link for article 30 of the CRPD is: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-30-participation-in-cultural-life-recreation-leisure-and-sport.html>
- 28** Adapted from the WBU web page explaining the Marrakesh Treaty; the full web link is: <http://www.worldblindunion.org/english/news/Pages/The-Treaty-of-Marrakesh.aspx>
- 29** The full web link for the CRPD is: <http://www.ohchr.org/EN/HRBodies/CRPD/Pages/ConventionRightsPersonsWithDisabilities.aspx#>
- 30** The full web link for the CRPD general comment number 2 on accessibility is: <http://www.ohchr.org/EN/HRBodies/CRPD/Pages/GC.aspx>
- 31** The full web link for the CBM “Disability Inclusive Development Toolkit” is: <http://www.cbm.org/article/downloads/54741/CBM-DID-TOOLKIT-accessible.pdf>
- 32** The full web link for the CBM document, “The Inclusion Imperative” is: <http://www.ohchr.org/Documents/Issues/Housing/Disabilities/CivilSociety/CBM-TheInclusionImperative.pdf>
- 33** The full web link for the Smart Cities for All toolkit is: <http://smartcities4all.org/#toolkits>
- 34** For a full description of the conditions please refer to: <http://www.w3.org/standards/webdesign/accessibility>
- 35** The full web link for the European Standard EN 301 549 is: <http://mandate376.standards.eu/standard>
- 36** The full web link for the Section 508 standards is: <https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards>
- 37** The full web link for the Smart Cities for All toolkit is: <http://smartcities4all.org/#toolkits>
- 38** The full web link for the web content accessibility guidelines is: <http://www.w3.org/standards/webdesign/accessibility>
- 39** The full web link for this Smart Cities for All publication communicating the importance of ICT accessibility is: [https://smartcities4all.org/SC4A\\_Communicating\\_the\\_Case\\_XT.php](https://smartcities4all.org/SC4A_Communicating_the_Case_XT.php)
- 40** Adapted from David Fazio’s “Harmony at Work” article. The full web link for this article is: [http://g3ict.org/resource\\_center/newsletter/news/p/id\\_390](http://g3ict.org/resource_center/newsletter/news/p/id_390)
- 41** The full web link for this article about M-Pesa IVR Solution is: <https://www.safaricom.co.ke/about/media-center/publications/press-release/release/405>
- 42** The full web link for the wheelmap.org webpage that provides information on how to use the maps, including updating map information, is: <https://news.wheelmap.org/en/faq/> The full web link for the map is: <https://wheelmap.org/en/map#/?zoom=14>
- 43** The full web link for the Click and Go wayfinding app is: <http://www.clickandgomaps.com/clickandgo-wayfinding-app/>. The full range of features offered by Click and Go can be accessed at this web link: <http://www.clickandgomaps.com>
- 44** The full web link for CBM’s “Humanitarian Hands-on Tool” app is: <http://www.cbm.org/CBM-launches-Humanitarian-Hands-on-Tool-HHoT--530657.php>

## Endnotes

- 45** This is adapted from a blog published on the CBM website. The full web link is: <http://www.cbm.org/CBM-launches-Humanitarian-Hands-on-Tool-HHoT--530657.php>
- 46** The full web link for this report by One Voice Coalition for Accessible ICT is: <http://www.onevoiceict.org/sites/default/files/Accessible%20ICT%20-%20Benefits%20to%20Business%20and%20Society.pdf>
- 47** The full web link for information on Serifs font legibility is: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4612630>
- 48** The full web link for information on Serifs font legibility is: <https://webaim.org/techniques/fonts/#readability>
- 49** The full web link for the Plain English Campaign is: <http://www.plainenglish.co.uk>
- 50** The full web link for the Change organisation is: <http://www.changepeople.org>
- 51** The full web link for the Change guide, "How to make information accessible" is: <http://www.changepeople.org/getmedia/923a6399-c13f-418c-bb29-051413f7e3a3/How-to-make-info-accessible-guide-2016-Final>
- 52** The full web link for the Web accessibility tutorials on structuring page content is: <https://www.w3.org/WAI/tutorials/page-structure>
- 53** The full web link for the colour contrast analyser and to download it is: <https://developer.paciellogroup.com/resources/contrastanalyser>
- 54** The full web link for the snook.ca colour contrast checker is: [https://snook.ca/technical/colour\\_contrast/colour.html#fg=33FF33,bg=333333](https://snook.ca/technical/colour_contrast/colour.html#fg=33FF33,bg=333333)
- 55** The full web link for Color Oracle is: <http://colororacle.org>
- 56** The full web link for the Penn State University guidelines on how to make charts more accessible is: <http://accessibility.psu.edu/images/charts>
- 57** The full web link for the Ontario University guidelines on describing graphics is: <https://carmenwiki.osu.edu/display/10292/Describing+Graphics>
- 58** The full web link for the Penn State University information on colour and contrast on web page is: <http://accessibility.psu.edu/color/contrasthtml>
- 59** The full web link for the W3C note on understanding WCAG 2.0, contrast, is: <http://www.w3.org/TR/UNDERSTANDING-WCAG20/visual-audio-contrast-contrast.html>
- 60** The full web link for the WebAIM colour contrast checker is: <https://webaim.org/resources/contrastchecker>
- 61** The full web link for information on alt text from Jim Thatcher is: <http://www.jimthatcher.com/webcourse2.htm>
- 62** The full web link for information on alt text from WebAIM is: <https://webaim.org/techniques/alttext/#overview>
- 63** The full web link for altformat.org, accessible text for learning, is: <http://www.altformat.org/>
- 64** The full web link for Diagram Center's "Image Description Guidelines" is: <http://diagramcenter.org/making-images-accessible.html#guide>
- 65** The full web link for information on making images accessible on Twitter is: <https://support.twitter.com/articles/20174660?lang=en#>
- 66** The full web link for the NCDAA tutorial on captioning YouTube videos is: <http://ncdae.org/resources/cheatsheets/youtube.php>
- 67** The full web link for information on automatically generating captions on your Facebook videos is: <http://wersm.com/how-to-automatically-generate-captions-on-your-facebook-videos>
- 68** The full web link for this video on automatically transcribing video/audio to text is: <https://www.youtube.com/watch?v=erx9czQsY2Q>
- 69** The full web link for DCMP tips and advice on editing captions is: <http://www.captioningkey.org/text.html>
- 70** The full web link for the Microsoft accessibility website is: <https://www.microsoft.com/en-us/accessibility>
- 71** The full web link for the Microsoft guide on how to use its accessibility checker tool is: <https://support.office.com/en-us/article/Use-the-Accessibility-Checker-on-your-Windows-desktop-to-find-accessibility-issues-a16f6de0-2f39-4a2b-8bd8-5ad801426c7f>



## Endnotes

- 72** The full web link for information on the limitations of accessibility checkers is: <https://accessible-digital-documents.com/blog/pdf-accessibility-checker/#errors>
- 73** The full web link for the Microsoft step-by-step tutorial for Word 2013 onwards is: <https://support.office.com/en-us/article/Make-your-Word-documents-accessible-d9bf3683-87ac-47ea-b91a-78dcacb3c66d?CorrelationId=dfdf4ff9-7c5e-4975-8e06-26356774364c&ui=en-US&rs=en-US&ad=US>
- 74** The full web link for the NCDAA one-page Microsoft Word cheat sheets is: <http://ncdae.org/resources/cheatsheets/#msword>
- 75** The full web link on how to make a PDF document accessible from Microsoft Word is: <http://www.pdfaccessible.com/en/tutorials/training-accessible-word>
- 76** The full web link for the Adobe website and information about accessibility is: <http://www.adobe.com/content/dam/Adobe/en/accessibility/products/acrobat/pdfs/acrobat-x-pdf-accessibility-best-practices.pdf> (PDF 6.42MB)
- 77** The full web link for the Microsoft "Make your Excel spreadsheets accessible" article is: <https://support.office.com/en-us/article/Make-your-Excel-spreadsheets-accessible-6cc05fc5-1314-48b5-8eb3-683e49b3e593>
- 78** The full web link for the NCDAA Excel cheat sheet is: <http://ncdae.org/resources/cheatsheets/excel.php>
- 79** The full web link for the Microsoft accessibility support guide for PowerPoint 2016 and online accessibility is: <https://support.office.com/en-us/article/Accessibility-support-for-PowerPoint-9d2b646d-0b79-4135-a570-b8c7ad33ac2f?ui=en-US&rs=en-US&ad=US#PickTab=Windows>
- 80** The full web link for WebAIM's information on PowerPoint accessibility is: <https://webaim.org/techniques/powerpoint/>
- 81** The full web link for the NCDAA cheat sheets on PowerPoint is: <http://ncdae.org/resources/cheatsheets/#mssppt>
- 82** The full web link for the Microsoft accessibility support guide for PowerPoint 2016 and online accessibility is: <https://support.office.com/en-us/article/Accessibility-support-for-PowerPoint-9d2b646d-0b79-4135-a570-b8c7ad33ac2f?ui=en-US&rs=en-US&ad=US#PickTab=Windows>
- 83** The full web link for WebAIM's information on PowerPoint accessibility is: <https://webaim.org/techniques/powerpoint/>
- 84** The full web link for the NCDAA cheat sheets on PowerPoint is: <http://ncdae.org/resources/cheatsheets/#mssppt>
- 85** The full web link for the PAC accessibility checker is: <http://www.access-for-all.ch/en/pdf-lab/pdf-accessibility-checker-pac.html>
- 86** The full web link for the PDF/UA PDF accessibility standard is: <https://www.pdfa.org/pdfua-the-iso-standard-for-universal-accessibility>
- 87** The full web link for the Adobe website and information about accessibility is: <http://www.adobe.com/content/dam/acom/en/accessibility/products/acrobat/pdfs/acrobat-xi-pro-accessibility-best-practice-guide.pdf> (PDF 9.76MB)
- 88** The full web link for WebAIM's information on PDF accessibility is: <https://webaim.org/techniques/acrobat>
- 89** The full web link for the PDF Accessible website is: <http://www.pdf-accessibility.com>
- 90** The full web link for ADD's information on PDF accessibility checkers is: <https://accessible-digital-documents.com/blog/pdf-accessibility-checker>
- 91** The full web link for the Change guide to making information accessible is: <http://www.changepeople.org/getmedia/923a6399-c13f-418c-bb29-051413f7e3a3/How-to-make-info-accessible-guide-2016-Final>
- 92** The full web link for the DAISY Consortium guide to create accessible EPUB 3 files is: <http://www.daisy.org/daisypedia/using-adobe-indesign-create-accessible-epub-3-files>

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- 93** The full web link for the EPUB 3 accessibility guidelines is: <https://idpf.github.io/a11y-guidelines>
- 94** The full web link for Matt Garrish's e-book, "Accessible EPUB 3", is: <http://shop.oreilly.com/product/0636920025283.do>
- 95** The full web link for the Diagram Center top tips for creating accessible EPUB 3 files is: <http://diagramcenter.org/54-9-tips-for-creating-accessible-epub-3-files.html>
- 96** The full web link for this information on making email accessible is: <https://smartech.gatech.edu/handle/1853/7333>
- 97** The full web link for advice on making your Outlook email accessible is: <https://support.office.com/en-us/article/Make-your-Outlook-email-accessible-71ce71f4-7b15-4b7a-a2e3-cf91721bbacb#PickTab=Windows>
- 98** The full web link for tips from Web Accessibility Initiative on getting started with web accessibility is: <https://www.w3.org/WAI/gettingstarted/tip>
- 99** The full web link for the Google "Introduction to Web Accessibility" online course is: <https://webaccessibility.withgoogle.com/course>
- 100** The full web link for the WordPress Accessibility team "Quick Start Guide" is: <https://make.wordpress.org/accessibility/handbook/quick-start-guide>
- 101** The full web link for the AChecker website is: <https://achecker.ca/checker/index.php>
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- 105** The full web link for the Web Accessibility Initiative accessibility evaluation resources is: <https://www.w3.org/WAI/eval/Overview>
- 106** The full web link for the Web Accessibility Initiative first review of web accessibility, easy checks, is: <https://www.w3.org/WAI/eval/preliminary>
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- 110** The full web link for the Web Accessibility Initiative is: <http://www.w3.org/WAI/>
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## Endnotes

- 120** The full web link for the W3C alternatives to CAPTCHAs is: <http://www.w3.org/TR/turingtest>
- 121** The full web link for the NDA tips on the five stages of IT procurement is: <http://universaldesign.ie/Technology-ICT/IT-Procurement-Toolkit/Stages-of-Procurement/1-Writing-an-RFT>
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- 127** The full web link for the AMAC website is: <http://www.amacusg.gatech.edu/amacat.php>
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- 140** The full web link for the Smart Cities for All website is: <http://smartcities4all.org>
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- 142** The full web link for the SUNY "Accessibility: Designing and Teaching Courses for All Learners" online course is: <https://www.canvas.net/browse/empirestate/empirestate-buffalostate/courses/accessibility-designing-teaching>
- 143** The full link for the edX Georgia Tech "Information and Communication Technology (ICT) Accessibility" online course is: <https://www.edx.org/course/information-communication-technology-ict-gtx-ict100x>
- 144** The full web link for the 3PlayMedia website is: <http://www.3playmedia.com/resources/webinars>
- 145** The full web link for the Syracuse University ITS services and applications toolkit is: <https://answers.syr.edu/display/itservapp011/Accessible+Technology+Toolkit>
- 146** The full web link for the Stanford University SOAP programme is: <https://soap.stanford.edu/>
- 147** The full web link for the ATAP ICT accessibility training videos is: <http://www.ataporg.org/ICTWebinars/Default>
- 148** The full web link for the Queen's University, Canada, social media accessibility web page is: <http://www.queensu.ca/accessibility/how-info/social-media-accessibility>
- 149** The full web link for the Office of the Texas Governor's information on accessible and assistive technology training is: <http://gov.texas.gov/disabilities/resources/assistivetech>



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