DIGITAL ACCESSIBILITY
AN ELABORATE OVERVIEW

Speaker: Joseph Mercieca, CDP™
For F-Secure Corporation (Product & Design stakeholders), Finland

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NOTE:
EFFORTS WERE MADE TO ENSURE THE SLIDES CONTENT CAN BE READ & UNDERSTOOD WITH LITTLE TO NO SUPERVISION.

ABOUT

For those who don't know me, my name is Joseph, a product/UX designer and I have / had:

- Been actively advocating accessibility since 2018

- Recently completed my *'IAAP Certified Professional in Accessibility Core Competencies'* certification preparation course via **Deque**

- Experience delivering learning facilitation to 10 y.o. kids with **ADHD** and **Dyslexia** back in 2008

PRESENTATION SCOPE

SCOPE

1. To provide a pathway towards best practices relative to digital accessibility and inclusive design

2. To shed light on disabilities and how these impede the use of digital technologies

3. To source you with legislative directives and compliances

4. To equip you with the basic skills to perform audits

5. To guide you in gradually employing an accessibility-first approach in your designs

Session estimated duration: 1 hour

ACCESSIBILITY: AN OVERVIEW

A11Y - MISSION

Accessibility (a11y) is focused on ensuring that digital interfaces, web, technologies, and premises can be used by people with disabilities (e.g. visual, auditory, cognitive, motor, and physical).

FOUNDATIONS (an overview)

Accessibility standards existed for decades; though momentum was gained in the past 5 years or so.

- 2020-2022: Europe Accessibility requirements for ICT products and services
- 2017: Section 508 from the Rehabilitation Act, US (section508.gov)
- 2010: ADA - Americans with Disabilities Act Standards for Accessible Design
- (2000)-2009: Charter of Fundamental Rights of the European Union (declared in 2000)
- 2005: Accessibility for Ontarians with Disabilities Act (Canada)
- 1997: Web Accessibility initiative was launched
- 1995: Disability Act (US)
- 1992: Disability Discrimination Act (Australia)
- 1986: Jim Thatcher invented the IBM Screen Reader
- 1964: The American Civil Rights Acts (tackling Accessible Building Facilities)

Full list of enacted laws: https://www.siteimprove.com/glossary/accessibility-laws/
(may not be updated)

WHY DOES IT MATTER?

1-IN-6 PEOPLE

or **80 MILLION** people in the EU have some form of disability

80%

OF DISABILITIES are not visible

There are over 61 million people in the US and over 1 billion people worldwide who have a disability, and that number is growing.

Over 2,500 US federal lawsuits were filed in 2020 against inaccessible websites. A 12% increase from the number of lawsuits in 2019.

It encourages good coding practices, it can help boost your SEO, and it provides an unprecedented level of independence to people with disabilities.

By fixing accessibility issues, you also improve your product's usability levels.

(sources: deque.com)

OVERLAPS

Accessibility (or Accessible design), inclusive design, and universal design share a similar goal that is to reduce the digital divide. Alas the commonalities, each discipline has its primary focus.

ACCESSIBILITY

Accessibility, or accessible design is narrowed on creating products for people with disabilities to foster interaction with digital systems

INCLUSIVE DESIGN

Describes methodologies and inclusive-design patterns.

It aims to fulfill as many user needs as possible by empathizing and considering: *age, gender, culture, language, economic situation, education, and accessibility*

UNIVERSAL DESIGN

Aims to create one experience that is accessed and used to the greatest extent by everyone.

Unlike inclusive design, universal design enforces a single design solution without need for adaptations or specialized design.

ACHIEVING COMPLIANCE

Becoming accessibility-compliant isn't just by design, but also by corporate mentality. That's what sets good organizations apart...

Further reading: https://www.thinkcompany.com/blog/how-to-create-an-accessible-organization/

STEPS TOWARDS COMPLIANCE

Steps towards an inclusive & accessibility mindset:

- **Educate** stakeholders about the value proposition, competition, legalities, and benefits

- Employ an **accessibility-first design approach** by following enacted guidelines and best practices **(e.g. WCAG 2.2, Section 508, recent EU legislations)**

- Employ an **accessibility-first development** by utilizing ARIA coding and semantics

- Perform accessibility **audits** on specific periods, such as when a new page or feature is created.

- Run **accessibility testing** by involving people with disabilities or the elderly. Please note that accessibility testing requires utmost patience, empathy, and appropriate facilities (e.g. assistive technologies).

THE 2-5% EXCUSE...

Despite everything, some shall always say otherwise!
From experience, stakeholders have a tendency to say that *"accessibility only accounts for 2-5% of our users/customers. Why should we invest time and resources on these?"*

Argument: A user can be healthy today but otherwise in the next days due to an illness, injury, traumas, or aging (think of Marlee Matlin, Christopher Reeve, Stephen Hawking).

Furthermore, one thing I did not account for relate to cases when users *'try and abort'* a process such as leaving a (inaccessible) website or stopping using a product (thanks to Ms. Stéphanie Walter).

Thus ask yourself - is the stakeholders' data always accurate?

Follow Ms. Stéphanie Walter via:
https://stephaniewalter.design/
https://www.linkedin.com/in/stephaniewalterpro/

BENEFITS FOR THE COMPANY

Tough stakeholders? Let's talk benefits.

Numerous advantages exist… not limited to:

- Improved brand reputation

- Legal compliance, risk mitigation and lawsuit prevention

- Competitive advantage

- Inclusive user and customer experience

- Improved reachability for extra audiences (web)

- Promoting and welcoming diversity (a tangible evidence)

- Accounting for the ageing population

References & further reading:
https://www.smashingmagazine.com/2021/07/strong-case-for-accessibility/
https://www.section508.gov/blog/benefits-accessible-design/
https://adasitecompliance.com/top-10-benefits-website-accessibility/

A FEW ROLE MODELS

There are many companies that take pride in **diversity** and **inclusion** including **accessibility**.
Below are several **excellent** examples:

https://www.barclays.co.uk/accessibility/

https://home.barclays/accessibility/

https://home.barclays/who-we-are/our-strategy/diversity-and-inclusion/

https://inclusive.microsoft.design/

https://learn.microsoft.com/en-us/windows/apps/design/accessibility/accessibility

EUROPEAN ACCESSIBILITY ACT (EEA)

Like other nations and continents, the EU established its own legislation framed under the European Accessibility Act (EAA) with the objective of ensuring that people with disabilities in the EU have fair access to products and services.

Key points:

- Products, especially "essential" ones must be compliant

- EEA doesn't reference WCAG, but implies a **WCAG 2.2 AA** minimum compliance

- Applicable for companies operating in, or sell in the EU

EU companies must ensure compliance by the:
28 JUNE 2025

EEA - further reading:
https://ec.europa.eu/social/main.jsp?catId=1202&intPageId=5581&langId=en
https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf
https://www.siteimprove.com/glossary/eu-web-accessibility-directive/
https://www.craigabbott.co.uk/blog/european-accessibility-act-what-you-need-to-know/

CASE SCENARIO
Example

A recent Ad campaign by F-Secure carried a flashy blinking video coupled with vibrant colors.

The visual blinks every 3 seconds which is problematic for viewers suffering with **seizures, epilepsy,** or **cognitive disabilities**. To achieve compliance, a 5 second interval must be applied.

The visual shifts from a 'very dark blue' to a 'vibrant blue' every 3 seconds. This move poses a stressful experience for viewers with **vision impairment** and sensitive to high contrasts.

The experience could become worse if users (accidentally) have their screen set on maximum brightness.

TIP 1:
CONVINCING STAKEHOLDERS IS A PROCESS REQUIRING PATIENCE & REPETITION.

TIP 2:
BE CONSIDERATE TOWARDS USERS & BE AWARE OF UNIQUE SITUATIONS.

TIP 3:
SITUATIONAL AWARENESS IS KEY. ALWAYS ACCOUNT USE CASES AND USER BARRIERS.

TIP: 4
ACHIEVING COMPLIANCE IS A LENGTHY PROCESS. THE SOONER YOU START, THE BETTER.

UNDERSTANDING DISABILITIES

ABOUT DISABILITIES

Various disability types exist.
These are either...

Congenital

(i.e., born with)

Acquired

(i.e., via accidents, traumas, ageing)

CLASSIFICATIONS

RECOGNIZABLE

These are the obvious & visible disabilities like physical deformation

HIDDEN

Invisible issues like deafness, back pain, low vision, psychological, etc...

TEMPORARY

Recoverable cases like light injuries, post trauma, & light surgeries

AGE-RELATED

As we age, our biological, motor & cognitive functions decline

CATEGORIES

In summary, there are **5 major categories** of disabilities, though it is safe to say that some may say otherwise…

VISUAL
E.g. color-blindness

SPEECH
E.g. aphasia, speech impediment

COGNITIVE
E.g. ADHD, Autism, Dyslexia

AUDITORY
E.g. deafness

MOTOR
E.g. limb paralysis
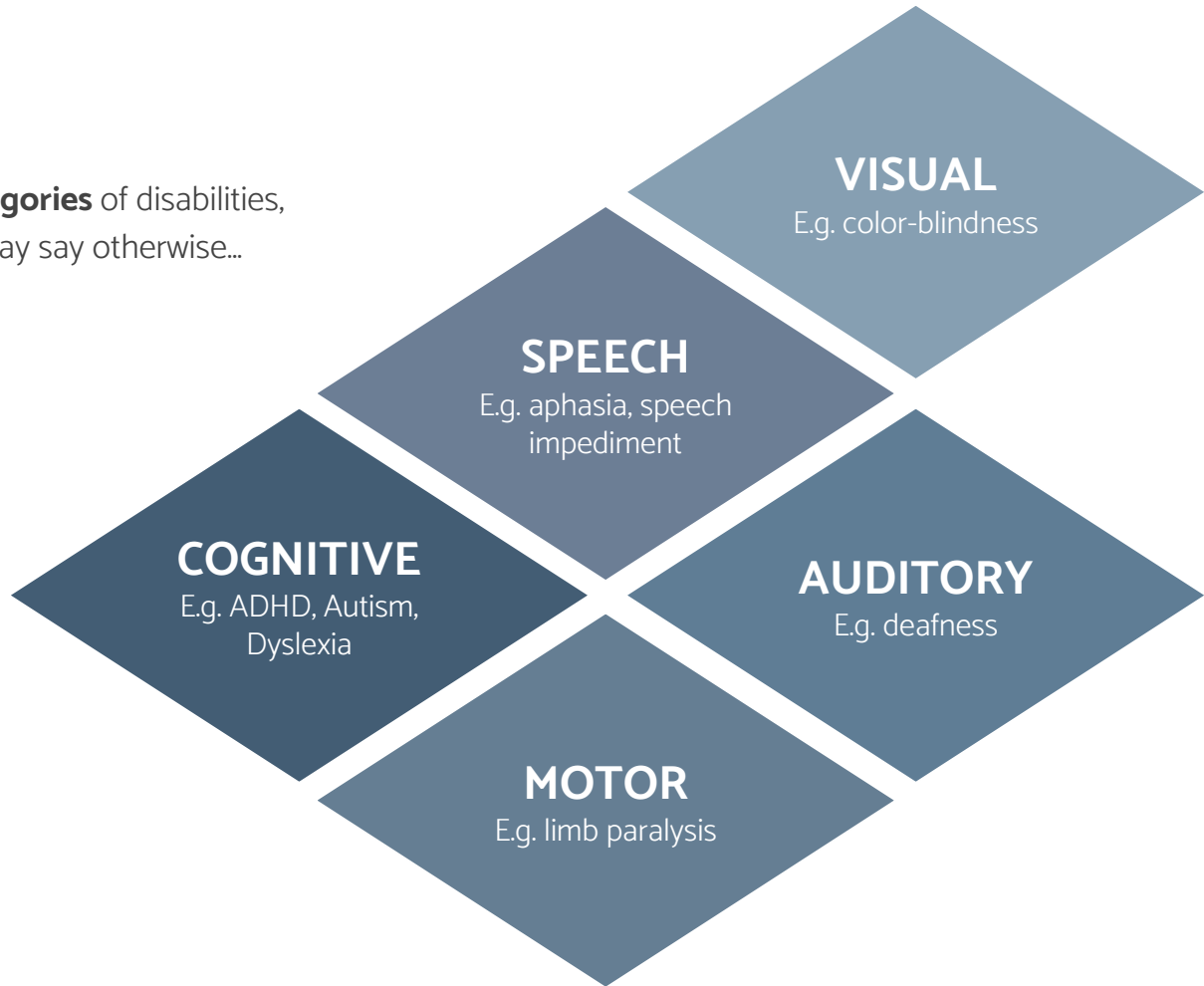
A LIST OF SOME (COMMON) DISABILITIES

Blindness

Low vision

Color blindness

Deafblindness

Auditory disabilities

Mobility, flexibility, and physical disabilities

Cognitive disabilities

Dyslexia / reading disabilities

Math disabilities

Speech disabilities

Seizure disorders

Psychological/Psychiatric Disabilities

We will cover common critical disabilities.   Given the amount of content, we will go through these quickly. You can revise the informative content at your own pace after I release the material.

COGNITIVE DISABILITIES

These arise from congenital and developmental conditions, as well as from **traumas**, **injuries**, **infections**, **chemical imbalances**, or other conditions later in life.

Limited Comprehension

- Difficulty understanding complex ideas.
- Difficulty handling metaphors or abstract language.
- May have high cognitive functions in one area (e.g., recalling numbers) –but low functions in other areas (e.g., soft skills).

Low Tolerance for Cognitive Overload

- Experience frustration in difficult situations,
- Frustration when processing too many things at the same time.
- They need things to be simple and straightforward.

Limited Problem-Solving Skills

- When presented with a problem to solve, some may be unable to solve it.
- Web **CAPTCHAs** may not be processed or understood

Short Term Memory Loss

- Difficulty remembering things from one moment to the next.
- May lose track of **long web processes** (e.g., signing up, system settings...)

Attention Deficit

- Hard to focus on the task at hand.
- Find **ads** and **content** alluring enough to forget why they went on the website

COGNITIVE DISABILITIES

Overcoming design challenges - issues and solutions

Complex designs and tasks can be overwhelming

- Provide simple and organized designs
- Simplify UI components
- Diminish or avoid alluring content (e.g., flashy ads)
- Provide alternatives to CAPTCHAs

Technical problems are hard to solve

- Carefully explain how people can recover from an error

Processing information especially complex texts is difficult

- Use easy language devoid of ambiguity
- Use images to reinforce understanding
- Arrange information in a logical sequential order

DYSLEXIA & LEARNING DISABILITIES

Overcoming design challenges - issues and solutions

People with dyslexia may typically experience the following:

- Perceive words as floating
- Reading fatigue
- Headaches
- **p b d q** seen as same letter
- Difficulty solving technical problems
- Difficulty processing complex information and texts
- Limited attention span

How designers can make things better? Below are a few tips:

- Provide Illustrations or audio to supplement text.
- Change font, contrast or add an underline to text to keep words in line
- Extend site time outs and return to the same location on the page
- Use easy language devoid of ambiguity
- Use images to reinforce understanding
- Use 'enhance visible focus' indicators to keep track of their position on page.
- Enable screen reader support to translate content in audibles
- Use a separate CSS (e.g. to load a dyslexia-friendly font)

How people with Dyslexia see text

Open Dyslexic was created to enhance readability

Dsxliyea Stmouiilan

Dtlcififuy Rdaineg

Many pploee with cigitnvoe dabetsiilis enripxecee dtuficfily randieg. Smoe read at a lewor leevl tahn teihr peres of the same age, and some can't read at all. It can hlep to pvidroe iilsrtnotuals or aiudo to spemelupnt text. Smoe ppoele with dxislyea have high levles of coigvtine fnnuitincog at a cpounaectl level, but tehir vauisl edinoncg of text is fwlead, so tehy have a hard tmie sellipng or rndeaig wdros. Three is a bit of a dcocesinnt beewten tiehr iniltelcegne lveel and teihr rindeag aiieltibs.

OpenDyslexic

Free and Open Source
Dyslexia Typeface

OpenDyslexic is a new open
sourced font created to increase
readability for readers with
dyslexia. The typeface includes
regular, bold, italic, and bold-italic
styles. It is being updated
continually and improved based
on input from dyslexic users.
There are no restrictions on using
OpenDyslexic outside of
attribution.

MATH DISABILITIES

Overcoming design challenges - issues and solutions

People with math disabilities have difficulty to:

- Distinguish right from left in graphic images

- Understand graphs, figures and diagrams

- Perform calculations

How designers can make things better? Below are a few tips:

- Provide simple data tables as alternatives to complex graphs

- Provide descriptive text alternatives

SPEECH DISABILITIES

Characterized by the inability to produce speech sounds and syllables correctly. These can be genetic or acquired by traumas like brain injury, stroke, cancer, etc.

These people require Augmentative & Alternative Communication (AAC) tools to help them formulate words, common phrases or replace speech.

Designers can help by ensuring that alternatives exists such as, text-supported chat options, and easy to access online forms.

Examples of speech disabilities include:

Stuttering

Cluttering - rapid speech inconsistent in rhythm and lack syntax, or grammar.

Apraxia - a motor speech disability resulting in difficulty using muscles to form sounds of words.

Dysarthria - a motor speech disability due to brain damage. The muscles for speech production are impaired, causing slurred / slow speech

Articulation disorders - difficulty in producing speech sounds. Certain speech sounds may be either omitted, added, substituted with other sounds.

Phonemic disorders - difficulty in distinguishing speech sounds in languages. Only a few sounds may be used, thus affecting word meaning. E.g., the words "call" may be pronounced as "tall", even though the person is attempting to use "call" and its meaning or her statement.

Muteness (mutism)

MOBILITY, MOTOR, & BODY STRUCTURE DISABILITIES

Mobility disabilities affect a person's ability to move independently and purposely due to missing limbs, multiple sclerosis, cerebral stroke, paralysis or arthritis.

These disabilities prevail from birth, due to aging, or the result of a disease. These can be temporary, permanent, or periodically recur or relapse.

Challenges with digital systems

- Unable to use mouse

- Due to slow movements, extra time is needed for UI interaction

Overcoming design challenges

- Interfaces must be compatible with A.T. (e.g. alternative keyboards, mouth sticks, speech recognition software, eye tracking)

- For session timeouts, options to extend time must be provided

SEIZURES

Abnormal or erratic electrical impulses in the brain that interfere with a person's ability to process information or control voluntary muscle movement.

Some seizures can result in violent convulsions that put a person at risk of injury.

Typically, seizures are caused by brain injury, dehydration, sleep deprivation, infections, fevers, drug overdose or withdrawals, and most importantly **flashing lights**.

Challenges with digital systems

- Sensitivity to flashing lights, blinking, and flickering stimuli

Overcoming design challenges

- Best is to avoid creating animations, videos, and graphics with flashing effects

- Flashing should not last for more than 3 seconds

AUDITORY DISABILITIES

Auditory disabilities involve hearing impairment, hearing loss, and complete deafness. As a result, these people have difficulty understanding speech and distinguishing foreground noise from background noise.

Depending on the condition, some people may use hearing aids, or **augmentative and alternative communication (AAC) technologies.**

Challenges with digital systems

- Audios and videos may not be heard

- Speeches cannot may not be heard

- Alarms and alerts may not be heard

Overcoming design challenges

- Provide synchronized captions with videos

- Sign language interpretation

- Transcripts

- Communicate alerts visually or haptically

VISION DISABILITIES

As we already know, various vision disabilities exist. Examples include:

- Blindness
- Low Vision
- Color Blindness *(Deuteranomaly, Protanomaly, Protanopia, Deuteranopia, Tritanomaly, & Tritanopia)*
- Red Black blindness
- Deaf Blindness *(Deafness and blindness combined)*

Subject to the vision disability type, issues can be overcome via <u>various</u> recommendations and best practices such as follows:

- Provide synchronized captions and transcripts with videos

- Sign language interpretation (for videos)

- Communicate alerts visually or haptically

- Support magnification (i.e. when the UI is configured to be enlarged by default via browser settings)

- Add text resizers

- Include a theme-switcher (e.g., light theme, dark theme)

- Use optimal text font weight, sizes, and ample line-height

- Avoid thin line art (e.g., icons)

- Be mindful in how to use contrasting, vibrant, and luminous colors

ASSISTIVE TECHNOLOGIES (A.T.)

Types of Assistive Technology

Computer Access
Alternate means for the individual to access the computer

Writing
Adaptives to produce text material

Reading
Adaptives to reading material to make it accessible.

Visual Aids
Enable individuals with visual impairments to gain information from various sources & activities

Physical Education, Leisure, & Play
Helps to enhance social interaction and participation in recreation activities

Augmentative Communication
Assistive means for communicating effectively in other ways than standard speech

Assistive Listening
Assistive ways to gain greater auditory access to information.

Mobility
Items & devices that enable individuals to move around more independently

Environmental Control
Enables individuals to gain independent control of their environment

Activities of Daily living (ADL's)
Enables individuals to gain independent control of daily functions (i.e. eating, dressing, etc.)
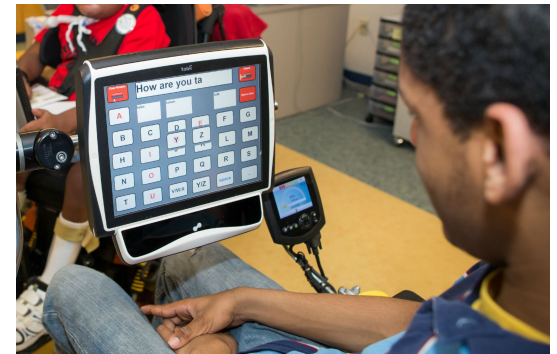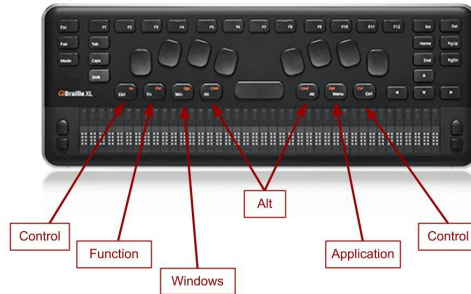
Seating & Positioning
Enables greater physical access to activities and environments

Equal Access

Modifier Keys (When Used in Conjunction with a PC)

Control

Function

Windows

Alt

Application

Control

A comprehensive list of AT by the Minnesota Guide to Assistive Technologies

https://mn.gov/admin/at/getting-started/understanding-at/types/

ASSISTIVE TECHNOLOGIES
A FEW PRACTICAL USE CASES

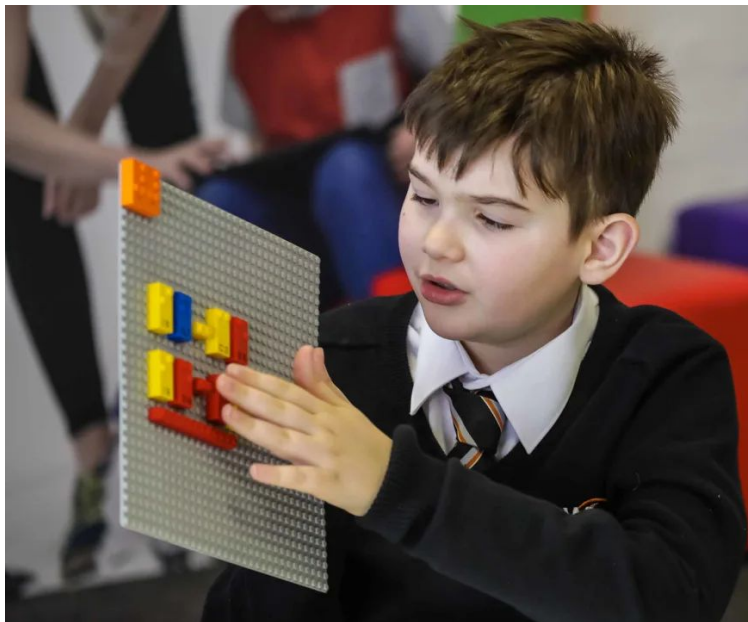| DISABILITIES	ASSISTIVE TECHNOLOGIES	
Blindness	Screen readers	Refreshable braille devices
Low vision	Screen readers	Screen enlargers
Color blindness	Color enhancement overlays or glasses	
Deafness	Captions	Transcripts
Motor & mobility disabilities	Head wand Mouth stick Alternative keyboards	Eye gaze tracking Voice activation
Cognitive disabilities	Screen readers Screen overlays	Augmentative communication aids

BRAILLE KEYBOARDS
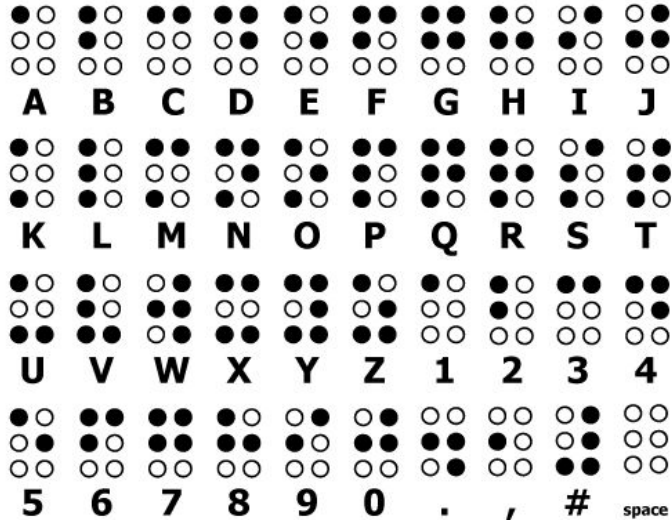
www.boxentriq.com

These are special keyboards tailored for blind people. Braille keyboards have elevated dots representing letters, numbers and symbols.

Points to consider:

- **Expensive:** Braille keyboards, particularly refreshable ones are very expensive and only a few can afford these.

- **Literacy:** Not every blind person knows how to read braille.

Lego releases Braille bricks to teach blind and visually impaired children

LEGO Braille Bricks

40656

P L A Y

LEGO Braille Bricks

Although assistive technologies help, they do not fully compensate for the disability. For example, screen readers can help, only so long the content is compliant with ARIA semantics.

Thus, product designers & content authors must ensure that content, markup, and interactive components are compatible with assistive technologies so to empower users with special needs.

ACCESSIBILITY GUIDELINES & CONFORMANCE

P.O.U.R

Accessible designs rely on **4 high level core principles** to achieve conformance:

PERCEIVABLE

Users can identify content and interface elements by means of senses *(visual, auditory, touch)*

OPERABLE

Users can successfully use controls, buttons, navigation, and other interactive elements

UNDERSTANDABLE

Users should comprehend, learn and remember how to use the interface *(ref. Learnability, memorability).* Content and functions should be consistent

ROBUST

Users should be able to choose the (assistive) technologies they use to interact with websites, online documents, multimedia, and other information formats

ACCESSIBILITY GUIDELINES

Below are guidelines used by professionals to achieve conformance levels.

Web Content Accessibility Guidelines (WCAG)

WCAG 2.2. (AUG 2023) - NEW:
https://www.w3.org/TR/WCAG22/

WCAG 2.1 - At a glance:
https://www.w3.org/WAI/standards-guidelines/wcag/glance/

WCAG 3.0 (in progress...):
https://www.w3.org/TR/wcag-3.0/

Rehabilitation Act (US)

Section 508:
https://section508.gov

Accessible Rich Internet Applications (ARIA) suite of web standards (for developers)

ARIA (code semantics):
https://www.w3.org/WAI/standards-guidelines/aria/

WCAG - CONFORMANCE LEVELS

WCAG guidelines keep evolving with more best practices and compliances. Currently, 3 success criteria (levels) exist as follows:

A

Covers most *"quick & dirty"* criteria, but **does not achieve a broad conformance** as the product still carries major accessibility barriers.

AA

The **commonly accepted** level required by enacted law. To achieve AA, the major and obvious accessibility barriers must be eliminated.

AAA

Achieving an AAA conformance level **is hard** unless the product is built with accessibility in mind (e.g. accessibility-first design approach).

Many countries have their enacted inclusive & accessibility compliances, often drawing on the WCAG guidelines.
For instance, Finland has: webaccessibility.fi

EVALUATION METHODS

ACCESSIBILITY AUDIT

Subject to requirements, time, and resources, an audit can either be:

BENCHMARK-DRIVEN
Performing an audit on a final product to determine whether compliances are met or not

PERFORMATIVE
Identifying and solving accessibility issues as you design or develop a digital solution (an iterative process)

ACCESSIBILITY AUDIT

Auditing consists in the following techniques:

MANUAL

A manual audit typically used to evaluate journeys and non web products (e.g. software). Also a technique used by experts

AUTOMATED

By using browser extensions (typically applicable for websites)

AUTOMATED AUDITS

Automated audits are performed via 'plugins'. Although these audits can be effective, please be mindful about the **pros** and **cons.**

- Easy and fast
- Good to spot most obvious issues
- Helps to detect coding (ARIA) issues

- False positives & negatives
- Can miss critical issues
- Tools may not be updated with recent compliances
- Don't tackle humane or situational requirements *(only accessibility experts can do that)*
- May not tackle assistive technologies

PREPARING FOR AN AUDIT

WCAG-EM: ACCESSIBILITY EVALUATION METHODOLOGY (EM)

Accessibility audits follow a consistent process. Determining the scope of an audit isn't easy as websites and products carry various layouts, structures and features.

WCAG-EM outlines a simple five-step procedure for accessibility evaluations, typically utilized by <u>expert</u> evaluators:

Step 1 - Define the evaluation scope

Step 2 - Explore the target website

Step 3 - Select a representative sample of web pages

Step 4 - Audit the selected sample of web pages

Step 5 - Report the findings

Further reading:
https://www.boia.org/blog/what-is-wcag-em-an-introduction-to-accessibility-evaluation-methodology

PERFORMING AUDITS: TIP#1

Knowing how you intend to run an audit helps at scoping your task and determine requirements not limited to time, tools and resources.

Screen by screen

Here, you run an audit by inspecting a screen from top to bottom to identify and fix issues within your designs

Flow by flow

Here, you audit by flows (e.g., configuring a software) to determine whether issues exist by navigating "happy paths", interacting with key interface touch points, and handling system errors

PERFORMING AUDITS: TIP#2

Audits can be exhaustive, especially on large digital solutions. Below is a recommended approach to audit large systems into parts (i.e., by a cluster of screens or flows)

"The best ROI and wisest thing to test for in your first audit are your site's key entry points, core paths, highest traffic pages, and most critical user flows."

 (Deque.com)

START

Audit critical pages, screens, and flows

Produce reports to DEV teams

Audit the remaining less critical assets

STARTING & RUNNING AN AUDIT

EASY CHECKS - ONE BASIC WAY TO START AN AUDIT

Easy checks represent a preliminary method to determine whether your web / product meets BASIC accessibility criteria **before embarking into a full fledged audit**. Below are the basic criteria that should get you started:

Page title (site, webpages, subpages…)

Image text alternatives ("alt text" attribute) (pictures, illustrations, charts, etc.)

Text:

- Headings (H1, H2, H3…)
- Contrast ratio ("color contrast")
- Resize Text

Interaction:

- Keyboard access and visual focus
- Forms, labels, and errors (including Search fields)

General:

- Moving, Flashing, or Blinking Content
- Multimedia (video, audio) alternatives
- Basic layout structure check (& resizing)

More information about easy checks, criteria, and evaluation process:

https://www.w3.org/WAI/test-evaluate/preliminary/

WCAG 2.2

Passing 'easy checks' doesn't mean your product is compliant. At best, you may achieve a 'Level A' conformance which isn't sufficient.
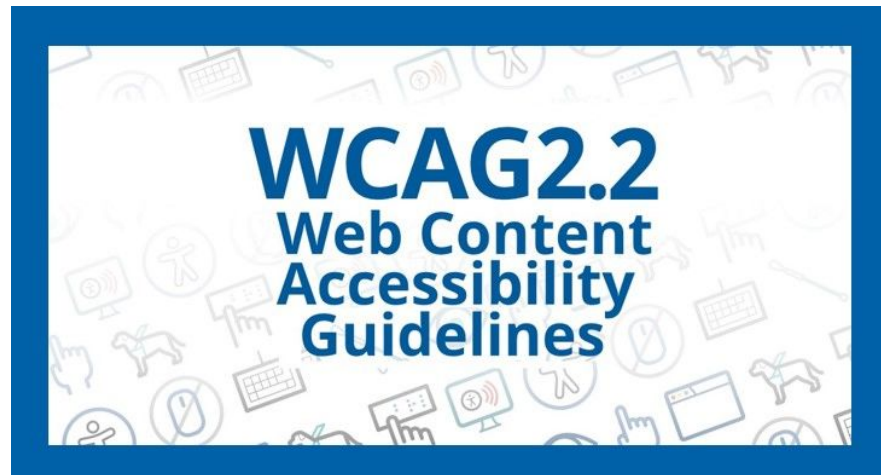
To guarantee compliance, one must meet the criteria enacted in the WCAG 2.2 AA guidelines.

https://www.w3.org/TR/WCAG22/

Note
Bear in mind that WCAG 2.2 was released in August 2023.
Materials, checklists, extensions and legalities might still require to comply with new updates.

SCREEN READERS

These read content aloud. Below are a **few points** to consider:

Language tag

The tag ‹html lang="se"› must be defined (in ISO 639-1) within the header. In this example, the screen reader knows that the language is Swedish (SE). If the language tag is missing, the screen reader may read Swedish content in English, with badly pronounced words.

Page title

Not only it's a best practice, but also critical as it informs users which page they are viewing.

Proper heading & section titles

Screen readers understand HTML attributes assigned to titles (e.g. H1, H2, title, alt, aria-label, label…). Also, they read content as 'it is'. For example *"Acme Group Inc. | About Us"* could be read as *"Acme Group Inc fullstop vertical slash about us"*.

Landmarks

Properties like ‹header›, ‹nav›, ‹footer›, etc. and sections (containers) must be declared. That way, the screen reader informs users when they are. For example with ‹nav›, the screen reader tells users that they are currently on a navigation. on a navigation. Landmarks help screen readers to know when to stop reading. More info: https://www.w3schools.com/accessibility/accessibility_landmarks.php

Display: none (CSS)

Older screen readers can detect content with a "display:none" CSS attribute.

KEYBOARD

The keyboard is a primary tool for users with special needs. Not only Keyboard compatibility is a design best practice but crucial for accessibility compliance. While performing audits, do so by navigating around without using a mouse device.   Below are a few top shortcuts:

TAB	to access and visually highlight (focus style) elements hierarchically (top down)
SHIFT+TAB	to access a previous (or skipped) element
SPACE BAR	used to view chunks of the page from top to bottom (similar to scrolling)
ARROWS	act as scrolling the website or other element (e.g. dropdown menus, carousels…)
ESC	to close a dialog / overlay
ENTER	to access a link or interactive element

Tips & more information:
https://webaim.org/techniques/keyboard/
https://www.csun.edu/universal-design-center/web-accessibility-criteria-tab-order
https://www.digitala11y.com/tab-role/

OK BUT...
HOW ABOUT
USERS' INFORMATION?

DIVERSE PERSONAS & USER STORIES

Barclays (UK), together with accessibility experts and people with disabilities, meticulously established a set of 'diverse' personas demonstrating how people with disabilities may interact differently with products and services.

Also, W3C has a section entitled 'How People with Disabilities Use the Web' with some user stories.
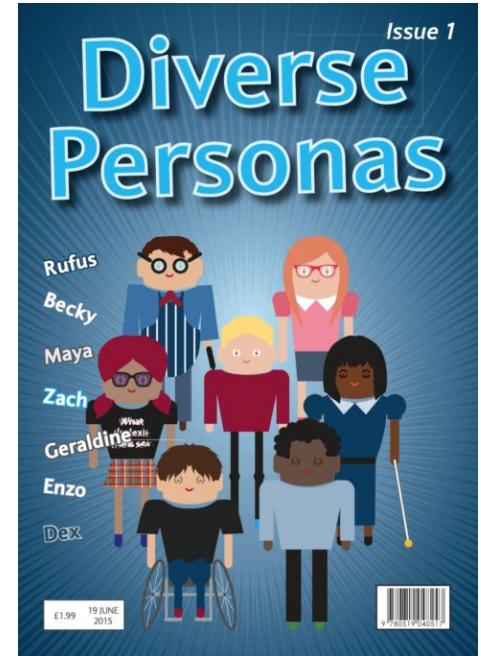
Taking these into consideration will assist you in creating better products and services for everyone.

Further reading and downloads:
https://www.w3.org/WAI/people-use-web/user-stories/
https://businessdisabilityforum.org.uk/?s=diverse+personas
https://www.abilitynet.org.uk/sites/abilitynet.org.uk/files/Barclays-Diverse-Personas-Issue-1.pdf

MAKING PRODUCTS COMPLIANT

A quick demo

MAKING PRODUCTS COMPLIANT

There are numerous ways to maximize compliance. Below are a few suggestions after running a 'quick & dirty' design audit:

- Account for **cognitive diversity** which is about designing for people with different intelligence (termed as 'cognitive inclusion' by Microsoft)

- Use **simple language** devoid of ambiguity

- Provide Illustrations or audio to supplement text to enhance understandability

- Account for the **visually impaired** (e.g., blurred vision, sensitivity to brightness, color-blindness)

- Include a theme switcher (i.e., dark theme, light theme)

- Ensure your **Design System**, branding, color palettes and assets are compliant.

- Develop **scalable** solutions **adaptive** to new best practices

- Include a **text resizing** function if a multitude of small texts are present

- Enhance **compatibility** with screen readers and keyboards

- Add **voice operation support** (e.g., Ok, run a scan...)
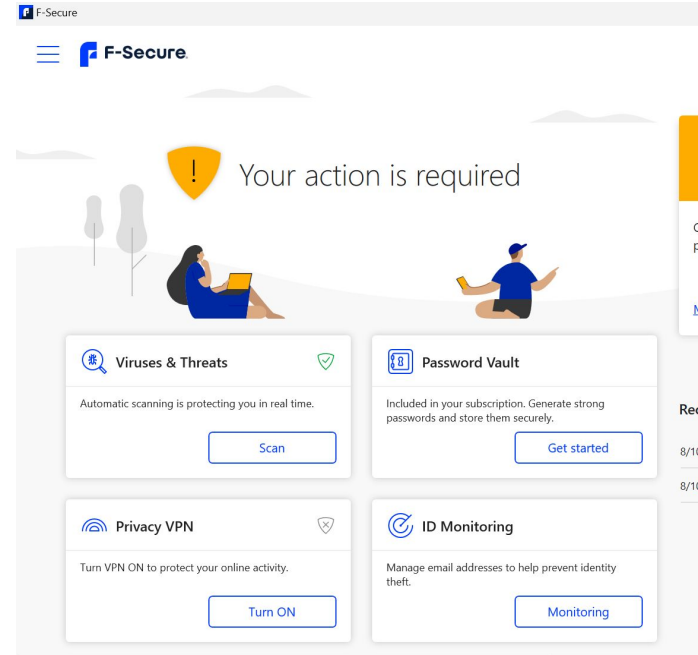
BY EMPLOYING AN
'ACCESSIBILITY-FIRST' DESIGN
METHOD, COMPLIANCE IS
GUARANTEED

ACCESSIBILITY-FIRST DESIGN

Employing an accessibility-first design method is an ethical approach to creating meaningful experiences tailored for people with disabilities aside non-disabled users.

- Be unbiased and emphatic

- Never assume you know enough about your users. Every disabled person has unique issues

- Understand disabilities and how these affect user-device interaction

- Prioritize simplicity and practicality instead of colors, fluff, and effects

- If needed, test your concepts by simulating disabilities (e.g., smear your glasses with cream to replicate vision blur, wear gloves to reduce finger sensitivity before you use the keyboard)

- Relate to the diverse personas (e.g., Barclays)

	Permanent	Temporary	Situational
Touch	One arm	Arm injury	New parent
See	Blind	Cataract	Distracted driver
Hear	Deaf	Ear infection	Bartender
Speak	Non-verbal	Laryngitis	Heavy accent

Inclusive
A Microsoft Design Toolkit

Further reading:
https://www.hattaway.com/post/building-inclusivity-with-accessible-first-design   https://www.24a11y.com/2017/accessibility-first/
https://www.dxw.com/2021/12/accessibility-first-design-approach/
https://www.eweek.com/enterprise-apps/tech-design-accessibility-first-approach/
https://dodonut.com/blog/empathy-first-design-how-to-get-started-with-accessible-design/

DO THIS

Primary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

Secondary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

Tertiary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

NOT THIS

Primary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

Secondary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

Tertiary Heading

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus non fermentum metus. Quisque finibus ultrices neque vitae tempor. (Body text)

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THE FULL REPORT

SEE FULL ARTICLE

NOT THIS

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READ MORE

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CONTRAST

HIGH VISIBILITY

NOT THIS

VIBRATES

LOW VISIBILITY

Source: https://www.hattaway.com/post/building-inclusivity-with-accessible-first-design

"Traditional user-centered design has many techniques to clarify human needs, from personas to scenarios to usability testing. But, we also need tools that reintroduce diversity back into our design process. We need ways to check, balance, and measure the inclusivity of our designs."
(Microsoft)

TOOLS & UTILITIES

SCREEN READERS

Modern computer operating systems come with built-in screen readers. Personally I found these screen readers hard to configure. For that I have included a few alternatives:

Name	Format	Comments	Link
NVDA	Installable software	*Freebie, and powerful (Windows only)*	https://www.nvaccess.org/
ChromeVox	Chrome plugin	*To pause, plugin must be removed*	https://chrome.google.com/
JAWS	Installable software	*Market leader (NOT free)*	https://www.freedomscientific.com/

AUTOMATED AUDIT TOOLS

Many extensions for Mozilla and Chromium browsers exist.   W3.org registered over **161 plugins** though, many are deprecated, or hard to use (https://www.w3.org/WAI/ER/tools/).   Before selecting an extension, **please check the following**:

- Last updated - If the tool hasn't been updated, chances are it is not compliant with recent WCAG amendments

- Active users & frequency of downloads

- The creator - Is the developer credible?

RECOMMENDED TOOLS

Below is a list of browser extensions that many, including myself recommend for automated audits.

Name	Comments	Link
WAVE	Probably the most known extension	Link
aXe Dev tools	Runs deep analysis (paid subscription needed to use all features)	Link
IBM Equal Access Accessibility Checker	Runs deep analysis. Super thorough	Link
Siteimprove Accessibility Checker	Quite decent to detect ARIA issues	Link
Accessibility Insights for Web		Link
ARIA Dev Tools	Ideal for ARIA Developers. Not suitable for designers	Link

These operate on websites that are either live or in staging environments.

RECOMMENDED SIMULATORS

These browser extensions simulate various disabilities. I highly recommend to try these to learn about disabilities and what to account for when designing / developing for this specific user group.

Name	Comments	Link
Daltonize	Replicates 5 types of color blindness	Link
Web Disability Simulator	Replicates disabilities incl. Motor and visual	Link
Silktide Disability Simulator	Replicates disabilities incl. Motor and visual	Link

These operate on websites that are either live or in staging environments. **Though you can operate most of these extensions by launching your Figma file directly from your browser.**

FIGMA TOOLS

Lately, I tried a few of accessibility tools for Figma. Currently I can recommend these:

Name	Comments	Link
Axe for Designers (Deque)	A free tool (sign-up required)	[Link](#)
Stark Accessibility Tools	A free tool (sign-up required)	[Link](#)

THANK YOU

For queries, I am reachable via:

email: joe.mrca@gmail.com

https://www.linkedin.com/in/jomrca/

GENERAL PRIMARY RESOURCES

https://deque.com
https://webaim.org/
https://www.w3.org/TR/WCAG22/
https://abilitynet.org.uk/
https://www.accessibility.com/design
https://www.w3schools.com/accessibility/index.php
https://www.w3.org/WAI/people-use-web/user-stories/
https://www.siteimprove.com/inclusivity/
https://18f.gsa.gov/2023/09/05/first-do-no-harm/

CHECKLISTS / ONLINE TOOLS

https://www.magentaa11y.com/native/
https://f-word.dev/episodes/19/
https://knowbility.org/blog/2022/whats-new-in-wcag-2-2
https://www.deque.com/blog/introducing-the-next-generation-of-mobile-accessibility-testing/
https://www.levelaccess.com/compliance-overview/en-301-549-compliance/
https://www.digitala11y.com/a-definitive-guide-on-how-to-perform-a-web-accessibility-audit/
https://mobilea11y.com/blog/accessibility-professionals/
https://www.browserstack.com/guide/accessibility-testing-for-mobile-apps

INCLUSIVE DESIGN

https://inclusivedesignprinciples.org/
https://inclusive.microsoft.design/

EXPERTS & LEARNING RESOURCES

https://www.a11yproject.com/
https://www.abra.ac/courses/kick-off
https://www.thebookonaccessibility.com/about/
https://www.smashingmagazine.com/category/accessibility/
https://www.w3.org/WAI/courses/foundations-course/
https://blog.pope.tech/2023/03/01/a-beginners-guide-to-manual-accessibility-testing/
https://learn.microsoft.com/en-us/windows/apps/design/accessibility/accessibility
https://stephaniewalter.design/blog/designing-for-accessibility-creating-inclusive-and-user-centric-products/
https://stephaniewalter.design/blog/accessibility-resources-tools-articles-books-for-designer/
https://kma.global/accessibility-tools-simulating-disabilities-by-cambridge/