CREATE SHARE & APPLY HUMAN CENTERED DESIGN KNOWLEDGE

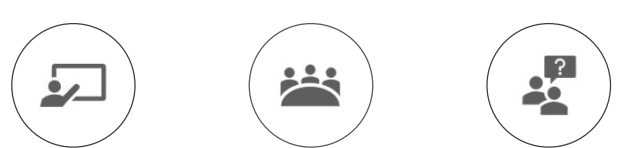## DESIGNING FOR ACCESSIBILITY

HCD Community of Practice

July 31, 2020

Human-Centered Design
Center of Excellence (CoE)

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Today's Community of Practice

Fundamentals of accessibility

Panel

Q&A

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Our Presenters

Htet Htet Aung
UX Designer, iQIES

Sandra Clark
Front-end Developer, iQIES

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VENTERA

FUNDAMENTALS OF ACCESSIBILITY

Presented by Htet Htet Aung & Sandra Clark

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" FOR PEOPLE WITHOUT DISABILITIES, TECHNOLOGY MAKES THINGS CONVENIENT, WHEREAS FOR PEOPLE WITH DISABILITIES, IT MAKES THINGS POSSIBLE. "

JUDY HUEMAN

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ACCESSIBILITY IMPROVES PEOPLE'S LIVES

- Accessible designs make life easier for people with disabilities.
- Or, in some cases, it's even more dramatic: accessibility makes things possible that would be otherwise literally impossible. In this sense, accessibility isn't just nice to have, it's necessary.
- Accessible websites/apps let people
  - Do their jobs
  - Conduct their personal banking
  - Make restaurant reservations
  - Access government benefits
  - Apply for college
  - Shop online
  - Read the news
  - Play online games… and anything else that is available on the web

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ACCESSIBILITY IMPROVES PUBLIC PERCEPTION

- If you have an accessible website/app, it shows that you—and the organization you work for—are committed to basic ideals of equal opportunity and fairness
- You can leverage your accessible website/app as a differentiator among your competitors or peers who may have less accessible web sites
- You show that you CARE

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- **Accessibility Increases Compatibility**
  - Your website/app will be compatible with a wider variety of web-enabled devices, because designing for accessibility requires that you pay attention to the robustness of your website in many platforms, browsers, and devices using a variety of input methods
- **Accessibility Improves Search Engine Optimization**
  - Many of the techniques required for accessibility involve smart use of semantic markup in the text and in the HTML, which also improves the ability of search engines to find and index your work with the appropriate keywords
  - Your users and potential customers will find your website more easily

- **Accessibility Increases Your Customer Base**
  - If people with disabilities cannot access your web site, it doesn't matter much if they like what you have to sell, because they can't go through the steps of purchasing anything
  - Accessibility benefits your bottom line
- **Accessibility Increases Your Eligibility for Funding**
  - If you do any contract work with government entities, chances are that you will be required to agree to make your deliverables accessible, because governments are often required to write those conditions in the requests for proposals
  - If you know how to make your deliverables accessible, and if you have a track record to prove that you have already done so in the past, you will be more likely to get the contract

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ACCESSIBILITY HELPS YOU AVOID LAWSUITS

- **In many areas of the world, creating inaccessible web sites is against the law**
- **The legal picture isn't always straightforward, but people with disabilities have rights, and they might decide to sue your company if the website is not accessible**
- **That's bad press, a huge expense, and it's totally avoidable if you create an accessible website in the first place.**
- **Accessibility keeps you out of court!**
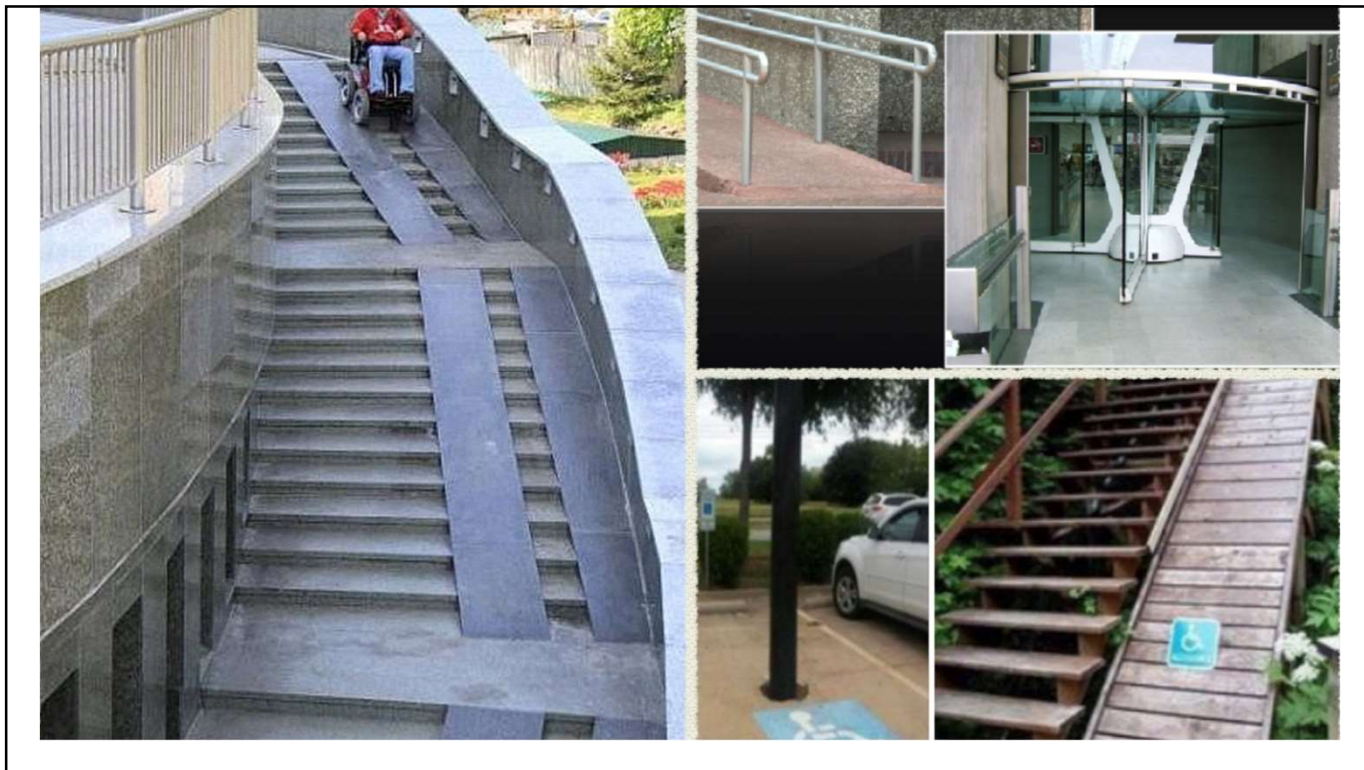

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MEETING ACCESSIBILITY GUIDELINES

- Section 508 of the Rehabilitation Act
- Requires the U.S. federal government to take accessibility into account when procuring information technologies: websites, telephones, copiers, computers, and other technologies, including both hardware and software
  - WCAG level A and AA guidelines are incorporated by reference and required by Section 508
- The Americans with Disabilities Act (ADA) applies to:
  - Businesses and other organizations open to the public, with the exception of religious entities and private clubs
  - Federal and state government entities

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YOUR APPLICATION CAN BE COMPLIANT YET INACCESSIBLE

ACCESSIBILITY > COMPLIANCE

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SOME ACCESSIBILITY ISSUES ARE OBJECTIVE

- Automated testing or special tools can help us determine some accessibility issues
- We can determine:
    - If inputs have associated labels
    - If images have alt text defined
    - If the color contrast is enough for the font-size
    - If the code is well-formed

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MOST ACCESSIBILITY ISSUES ARE SUBJECTIVE

- Is there an understandable document hierarchy with titles and sections correctly labeled and identified?
- Do the labels for inputs accurately describe the inputs they are associated with?
- Do informational images have alt text that realistically describe the images?
- Do the link texts make sense? Will the user know where the links will lead them?
- Can a user navigate a page using only their keyboard in a consistent and understandable manner?
- Can a user navigate the site without getting lost?

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WHAT IS DIGITAL ACCESSIBILITY?

- **Development of systems and applications flexible enough to accommodate the needs of the broadest range of users... regardless of age or disability ...so that everyone can have the same user experience when they access these types of digital components**

- **Encourages good design and development practices**

- **Supports**
  - **Search engine optimization**
  - **Internationalization**
  - **Mobile-friendly content**

- **Estimated 10-20% of the World's population has a disability**

- **Accessibility benefits everyone!**

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FOUR MEASURES

Criteria for Digital Accessibility

Perceivable

users must be able to perceive the information and user interface in a way that is presentable

Operable

users must be able to operate the interface successfully

Understandable

users must be able to understand the information and user interface

Robust

content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies

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SIMON JOHNSON

Low Vision

- **Financial, government tax law, and tax prep websites**
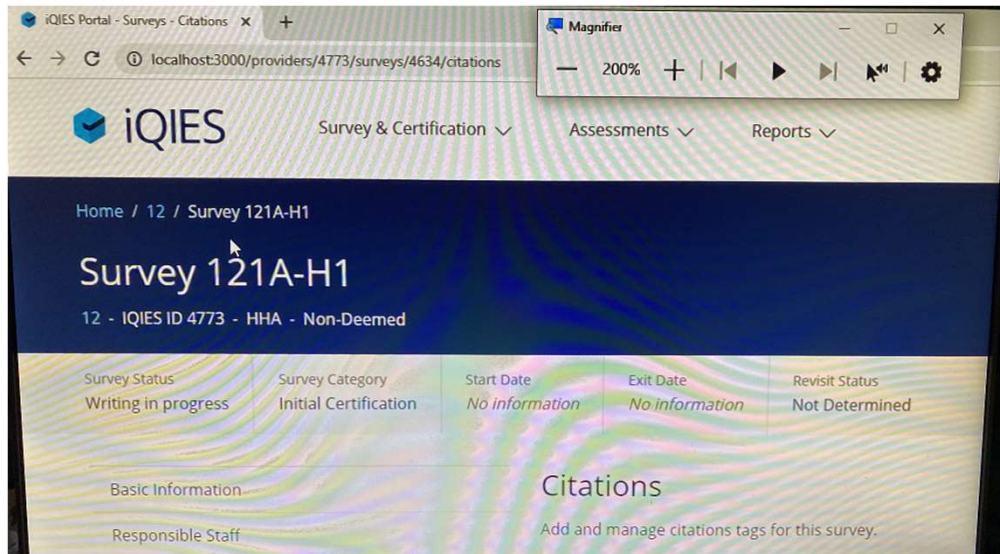- **Social media**
- **Online shopping**

DEMOGRAPHICS

- **Age 55**
- **Married**
- **Accountant**

WANTS AND NEEDS

- **Bigger fonts and images**
- **High contrast**

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WHAT A LOW VISION USER SEES

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COLOR CONTRAST

USE GOOD COLOR CONTRASTS AND READABLE FONT SIZE

-	**Common**	-	**Pass**
-	**Sense**	-	**Pass**
-	**Is**	-	**Pass**
-	**Vital**	-	**Pass**
-	**When**	-	**Fail**
-	**Considering**	-	**Fail**
-	**Color**	-	**Fail**
-	**Contrast**	-	**Fail**

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COLOR CONTRAST

Text with almost exactly 4.5:1 contrast

- Gray (#767676) on white
- Purple (#CC21CC) white
- Blue (#000063) on gray (#808080)
- Red (#E60000) on yellow (#FFFF47)

- Gray (#767676) on white
- Purple (#CC21CC) white
- Blue (#000063) on gray (#808080)
- Red (#E60000) on yellow (#FFFF47)

50 most played songs by genre
music

50 most played songs by genre
music

I have read and agree to the Terms of Use

I have read and agree to the Terms of Use

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USING COLOR ONLY

DO NOT USE COLOR ONLY TO CONVEY MEANING

The green mushrooms are OK to eat.
The red mushrooms will kill you.

- Amanita
- Chanterelle
- Porcini
- Shitake
- Tylopilus

- Amanita
- Chanterelle
- Porcini
- Shitake
- Tylopilus

USE A COMBINATION OF COLOR, SHAPES, AND TEXT

The mushrooms with checks are OK to eat.
The mushrooms without checks will kill you.

- Amanita✓
- Chanterelle
- Porcini✓

- Shitake✓
- Tylopilus

Designing for users with low vision

Do...		Don't...	
use good colour contrasts and a readable font size	Aa	use low colour contrasts and small font size	Aa
publish all information on web pages	? HTML	bury information in downloads	?
use a combination of colour, shapes and text	Start ?	only use colour to convey meaning	● ● ●
follow a linear, logical layout	200% magnification ?	spread content all over a page	200% magnification !?
put buttons and notifications in context	Submit	separate actions from their context	Submit

Home Office   Digital, Data and Technology

For more information, contact: access@digital.homeoffice.gov.uk

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ANGIE JONES

Deaf

- Typical business and medical billing/coding software and internet searches
- Social media
- Online shopping
- Live video messaging like FaceTime

DEMOGRAPHICS

- Age 34
- Married
- Mother of two
- Medical Coding

WANTS AND NEEDS

- Audio or video with captions and transcription
- Simple and concise language, short sentences
- Clear start/stop/pause UI
- Avoid jargon and idioms as English is a second language for deaf people

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MAKE SURE USERS KNOW WHAT'S ON THE PAGE

- Make the content and functionality available through sight, sound, and touch
- Make Images, Videos, Audios perceivable
  - Be sure to provide adequate description for informational and functional images
  - Provide synchronized captions for the deaf
  - Provide synchronized audio descriptions for the blind
  - Provide a text transcript for those who are both deaf and blind

Designing for users who are D/deaf or hard of hearing

Do...	Don't...
write in plain language — Do this.	use complicated words or figures of speech
use subtitles or provide transcripts for videos — CC	put content in audio or video only
use a linear, logical layout	make complex layouts and menus
break up content with sub-headings, images and videos	make users read long blocks of content
let users ask for their preferred communication support when booking appointments	make telephone the only means of contact for users

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BOBBY BENNET — Muscular Dystrophy

15 years

- Access educational programs
- Play games

DEMOGRAPHICS

- Age 15
- Student

WANTS AND NEEDS

- Can only use keyboard (via joystick)
- Easy to use apps
- No time limits

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EVERYTHING HAS TO WORK

- The goal of operability is to ensure that web components work.
- All features—particularly navigation and dynamic or interactive components—must be functional, no matter what input device a person is using
  - An accessible web app must work with all of the input devices:
    - Mouse or touchpad
    - Keyboard
    - Touchscreen
    - Voice recognition software
    - Other specialized input devices (most of which emulate the keyboard or mouse)

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KEYBOARD ONLY ACCESS

DESIGN FOR KEYBOARD OR SPEECH ONLY USE

- **When you make things accessible with a keyboard, you make it work for everyone**
- **Make sure it is always visibly apparent which element has focus**
  - **Don't remove focus indicators**
- **Avoid using apps, plugins, widgets, or JavaScript techniques that trap the keyboard**
  - **Users should be able to get into and out of any user interface element**
- **Provide links that are visible (when tabbing through using keyboard) that let users skip to the areas they need to go easily**

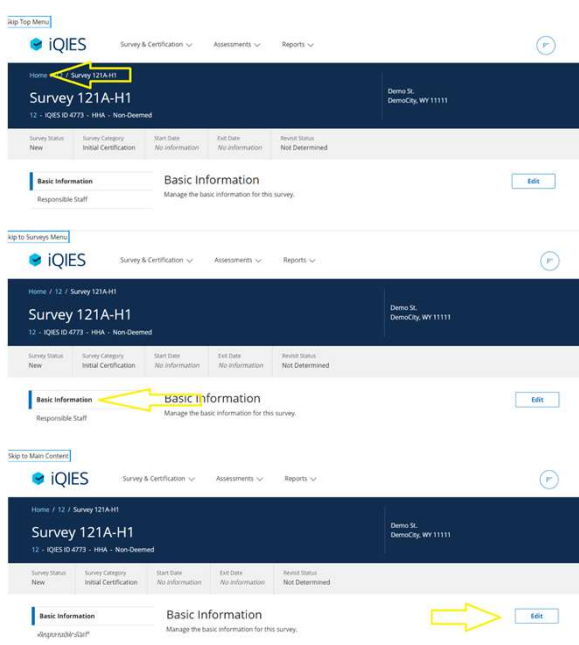

Designing for users with physical or motor disabilities
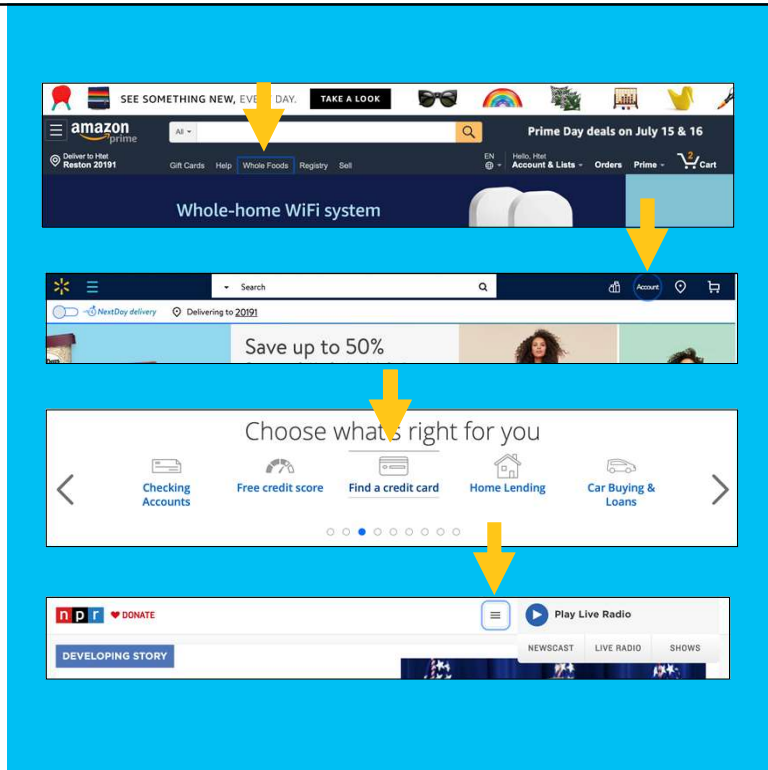
Do... / Don't...

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Allow user to skip over repetitive and/or lengthy lists of links


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EFFECTIVE VISUAL FOCUS

- **Plan your focus states**
- **Reuse :hover state for :focus**
- **Use text-decoration: underline for links**
- **Use background color changes to indicate focus**
- **Test with keyboard only**

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PROVIDE ACCESSIBLE TIME LIMITS

- Allow users to do one or more of the following:
  - Turn off
    - The user is allowed to turn off the time limit before encountering it
  - Adjust
    - The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting
  - Extend
    - The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times
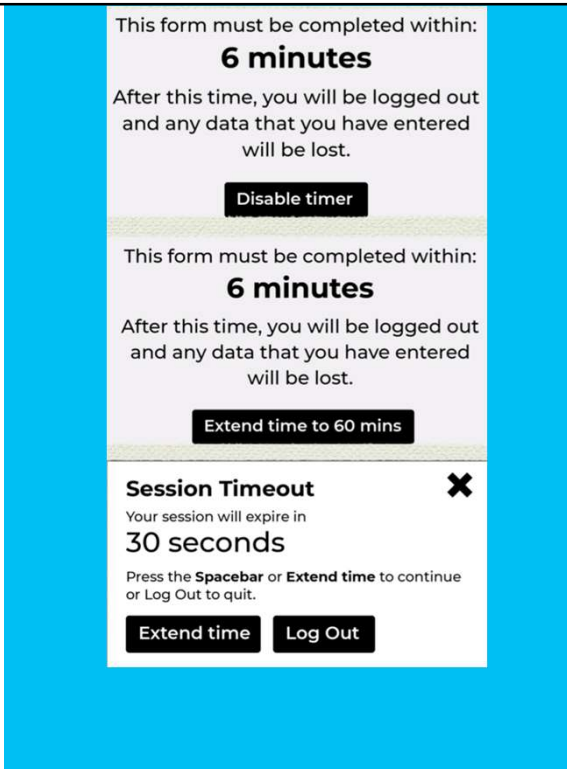
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MARY SMITH

Legally Blind

- Uses a screen reader for:
  - Reading digitized copies of course readings and navigating various websites
  - Social media
  - Online shopping

DEMOGRAPHICS

- Age 24
- Single
- Graduate Student

WANTS AND NEEDS

- Sites that are easy to navigate (have landmarks)
- Content that is scannable and understandable via screen reader
- To skip around repetitive lists (like menu)

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MAKE DYNAMIC CONTENT PERCEIVABLE

- Blind users won't know when content or state changes on the page unless the system lets them know
  - You can use ARIA ("Accessible Rich Internet Applications") to announce when a tab is "expanded" or "collapsed"
  - You can use an ARIA live region to announce new content as it is inserted into the DOM (Document Object Model)
- If new content is injected into a page—such as an error message or a confirmation message— blind users need to hear this new information
  - ARIA live regions can be used for this purpose, or you can move the browser's focus to those areas to force screen readers to read them

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MIKE ROBERTS

Autistic

- Scheduling app to check his work schedule for current and upcoming week
- Birdwatching sites to get updates from local birders
- Social media

DEMOGRAPHICS

- Age 32
- Single
- Bus Driver / Birdwatcher

WANTS AND NEEDS

- Minimal sensory overload — no flashing banners, popups, or bright colors
- Clear, concise instructions and simple language
- Clear call to actions and clear error/warnings

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AUTISM

- Consistent Navigation and Layout across the system
- Same or similar actions on similar UI components should produce similar results
- Reduce clutter and distractions.
- Simple, plain text. Identify non-standard terms as well as abbreviations and acronyms
- Avoid time limits, and automatic refreshes
- Clear instructions and error messages when filling out forms

Designing for users on the autistic spectrum

Do...		Don't...
use simple colours	Do this.	use bright contrasting colours
write in plain language		use figures of speech and idioms
use simple sentences and bullets		create a wall of text
make buttons descriptive — Attach files		make buttons vague and unpredictable — Click here!
build simple and consistent layouts		build complex and cluttered layouts

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For more information, contact:
access@digital.homeoffice.gov.uk

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XENA SMITH
Attention Deficit Disorder

- Development tools and websites related to software development
- Social media
- Online shopping
- Streaming services

DEMOGRAPHICS

- Age 22
- Single
- Software Engineer

WANTS AND NEEDS

- Distraction free layout
- Find-ability
- Clear instructions and error handling
- Extended time or no time limitations

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ATTENTION DEFICIT DISORDER

STRESSED, DISTRACTED, USING APP WHILE ON THE MOVE

- Common Interactions
  - A need to focus on most important thing
- Needs
  - Distraction Free Layout
    - Avoid animations and auto updating content
    - Give the user control over what they can show or not
  - Findability
    - Consistent navigation
    - Relevant Autosuggestion when searching help
  - Clear Instructions and Error Handling
  - Avoid Time limitations

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ANXIETY

- **Timing is everything. Make sure your timing is long enough to allow users to complete an action**
- **Explain what will happen after a user does something**
- **Clearly show what is important**
- **Allow users to check their answers and be sure they are correct before submitting them**

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DYSLEXIA

- **Images and diagrams may come in handy here to support text**
- **Text should be in a consistent layout and left aligned.**
- **Other formats may be used (audio)**
- **Make sure the page reads well in a screen browser such as Chrome/Vox**
- **Avoid placing text in images that can't easily be read.**
- **Short and clear content**
- **Allow users to change the contrast between background and text**

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DYSLEXIA READER CHROME EXTENSION

Home / Search / Results

Search Results

Providers | Intakes

> Show Filters

1 - 20 of 33187 Providers

Provider ⁝	Provider Type	CCN ⁝	Legal Business Name ⁝	Federal Certification Status ⁝	Actions
OLSTEN CERTIFIED HEALTH CARE CORP 433 S MAIN ST W HARTFORD, CT 06110	HHA	077188		Certified	View
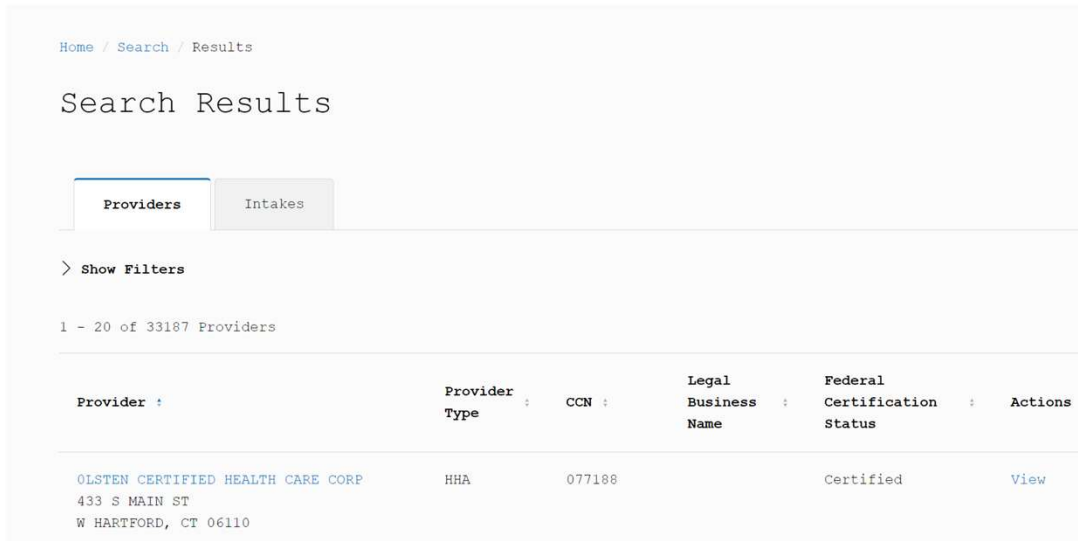
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SEIZURE DISORDER

AVOID FLASHING/STROBING CONTENT

- Animations may cause vertigo, dizziness, nausea, or pain for some people
- Parallax effect may cause headaches
- Flashing content can trigger seizure
  - More than 3 times in any one-second period
  - To understand more, refer to **sateach.es/vestibular**
- Tools
  - **W3C guidelines for general flash and red thresholds**
  - **Photosensitive Epilepsy Analysis Tool (PEAT)**

Guidance

- **Allow users the choice to turn animations off**
- **Make sure your site or app doesn't rely on animation**
- **Dissolve effect is better than sliding effect**

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EQUALITY VERSUS EQUITY

In the first image, it is assumed that everyone will benefit from the same supports. They are being treated equally.

In the second image, individuals are given different supports to make it possible for them to have equal access to the game. They are being treated equitably.

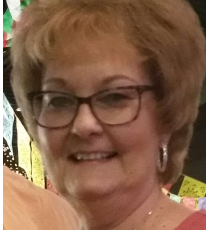In the third image, all three can see the game without any supports or accommodations because the cause of the inequity was addressed. The systemic barrier has been removed.

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PANEL DISCUSSION

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OUR PANEL

Brinda Large
Program Analyst, COR,
Section 508 Compliance Officer
CMS

Htet Htet Aung
UX Designer, iQIES

Sandra Clark
Front-end Developer, iQIES

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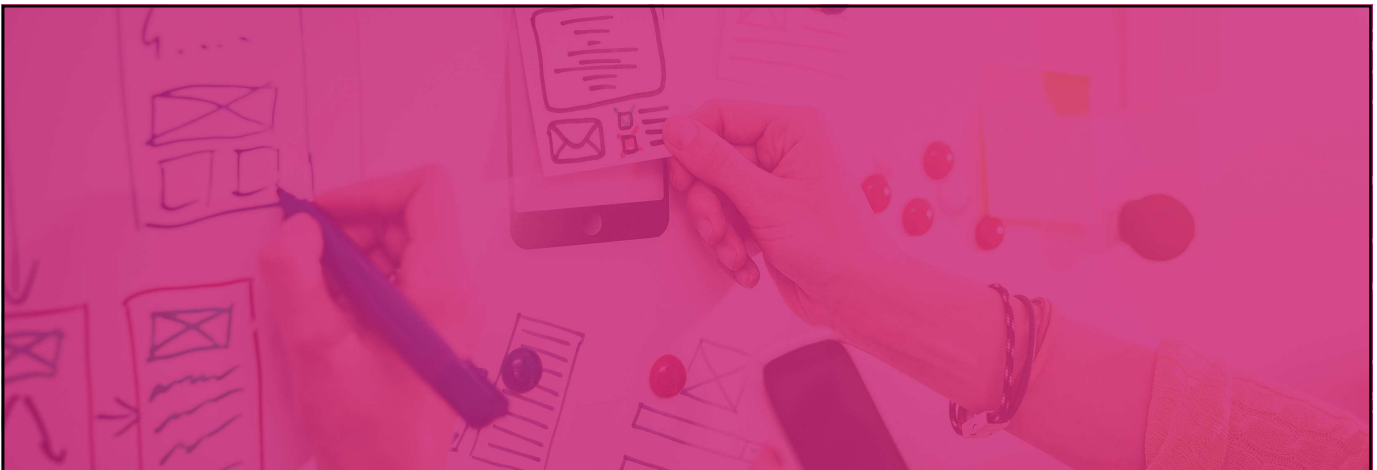
HOW ACCESSIBLE IS ACCESSIBLE?

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INTEGRATING ACCESSIBILITY INTO THE PROCESS

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Q&A

Please unmute yourself or use the Zoom chat feature

Photo by Camylla Battani on Unsplash
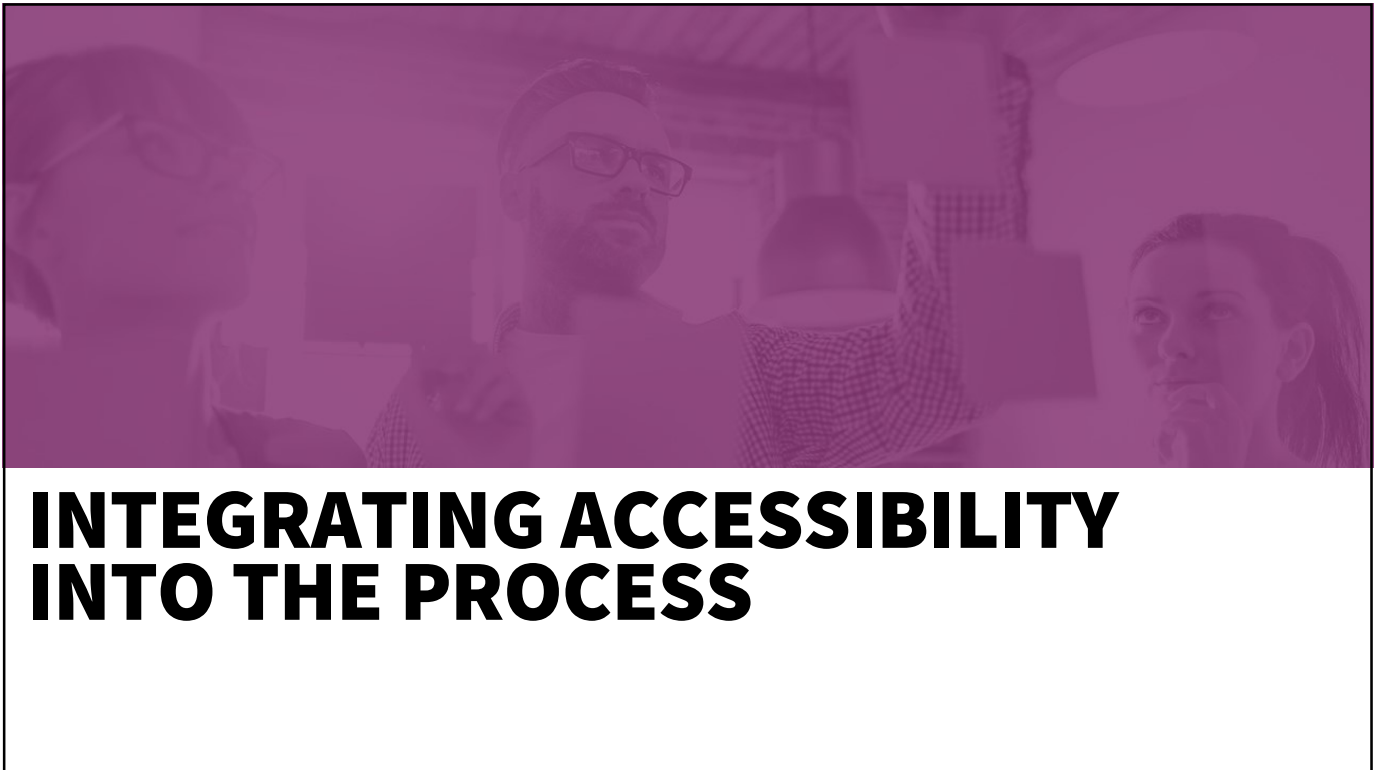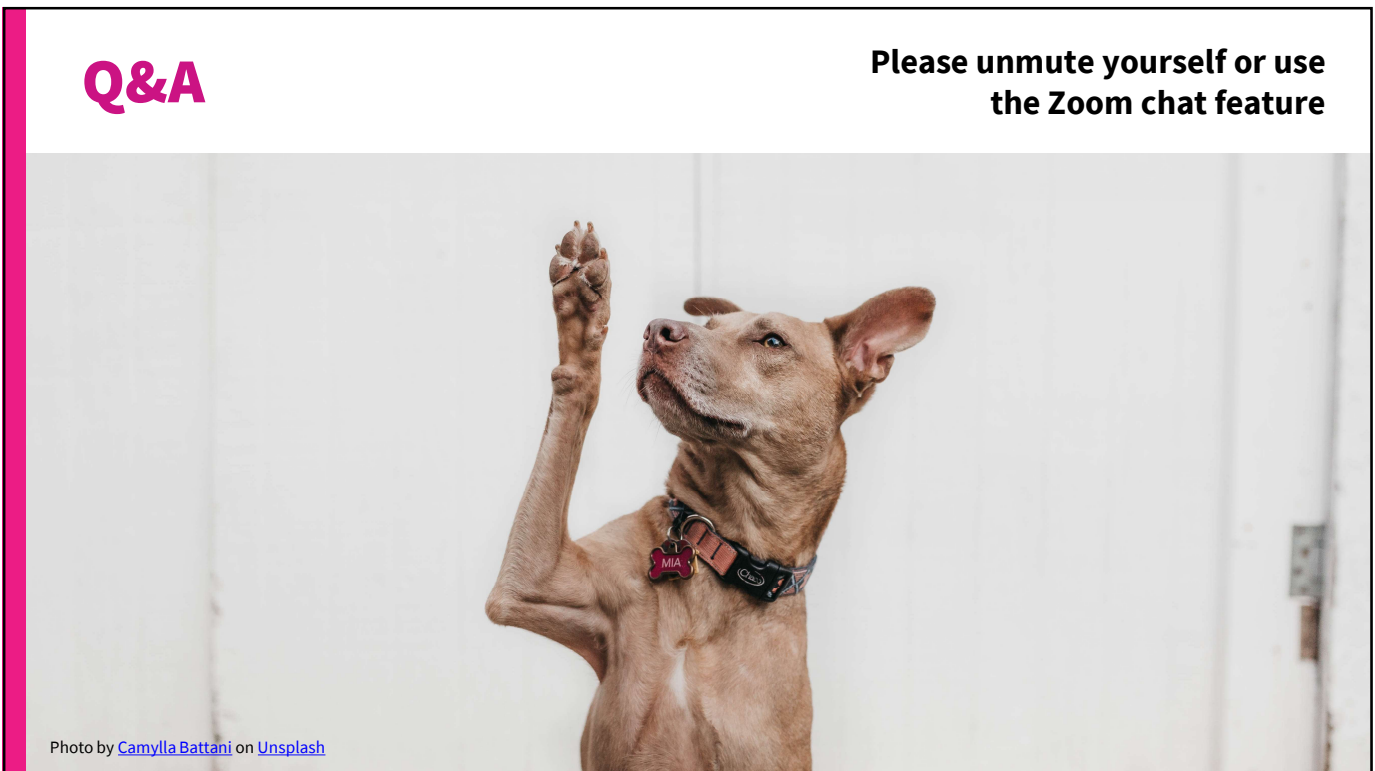
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QUICK INFO

Photo by James Hammond on Unsplash

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WORLD USABILITY DAY

November 12, 2020

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DESIGNING WORLD USABILITY DAY

Join the HCD Community of Practice to brainstorm and give shape to ISG's World Usability Day.

When: Friday, August 14, 1-2 PM

Where: Zoom

How: register now (see link in Zoom chat)

Photo by Patrick Perkins on Unsplash

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UPCOMING

Open call for presenters, panelists, speakers
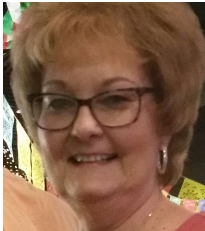- HCQIS Slack #hcd-share
- email hcd@hcqis.org

Top topics of interest
- Case studies
- Interaction design
- Visual design

Coming up
- Brainstorming World Usability Day – August 14
- Community of Practice – August 28
- World Usability Day - November 12

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MUCH APPRECIATION.

Brinda Large
CMS

Htet Htet Aung
iQIES

Sandra Clark
iQIES

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CONTACT

HCQIS Slack #hcd-share

hcd@hcqis.org

https://confluence.hcqis.org/display/HCD

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Advocacy   Resources

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THANK YOU!

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CREATE & **APPLY**
SHARE
HUMAN
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DESIGN KNOWLEDGE

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