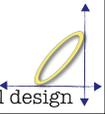
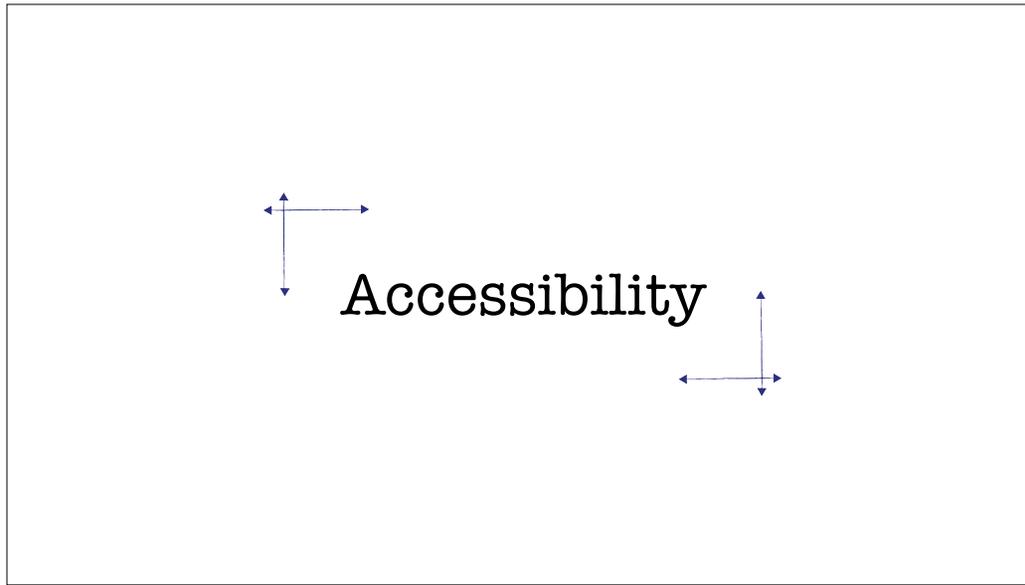


An Alphabet of Accessibility

anne gibson, IA Summit, 2018



perpendicular angel design



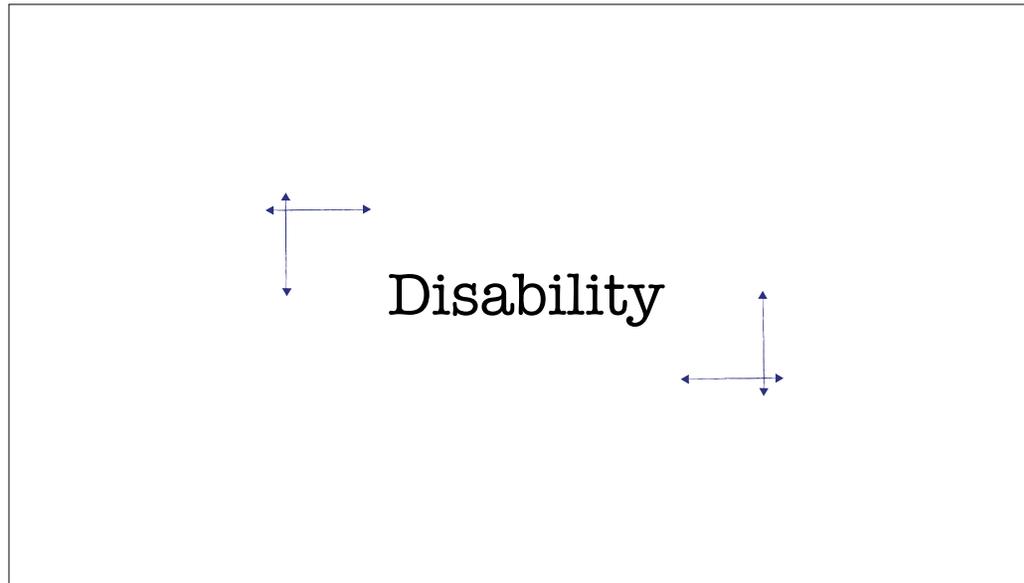
Today we're going to talk about accessibility on the web.



“Web Accessibility means
that people with disabilities
can use the web.”

-W3G Introduction to Web Accessibility

Web accessibility means that people with disabilities can use the web. If everyone can use a thing, it's accessible. If someone with a disability can't use a thing, it's not accessible.

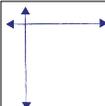


We can't talk about accessibility without talking about Disability

So here are a few things you should know about me before I continue:

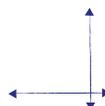
- I'm not an expert. I'm going to make at least a dozen mistakes talking about conditions some of you have lived.
- I'm going to use phrases like "people with disabilities" and "disabled people" which some communities are okay with, and others dislike.
- It's also really possible that I can make this talk more accessible than it currently is. Please know that I'm still learning, and I want to get better at this.

So... who are these "people with disabilities" that we're designing for?



“If people with disabilities were a formally recognized minority group, at 19% of the population, they would be the largest minority group in the United States.”

- *The institute on Disability*



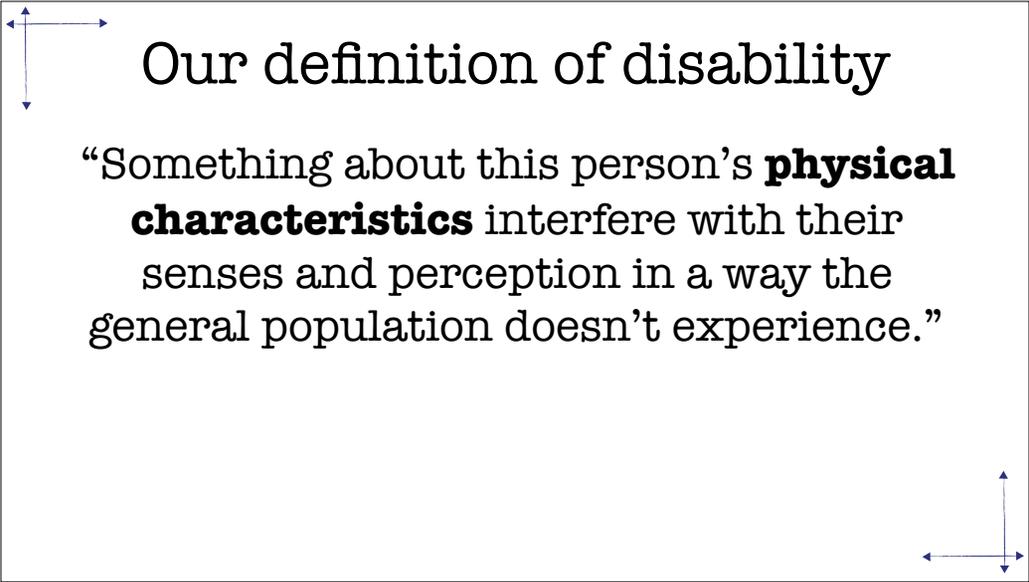
Disability Doesn't Discriminate

- Any age
- Any race
- Any gender
- Any religion



Photo by Times Higher Education

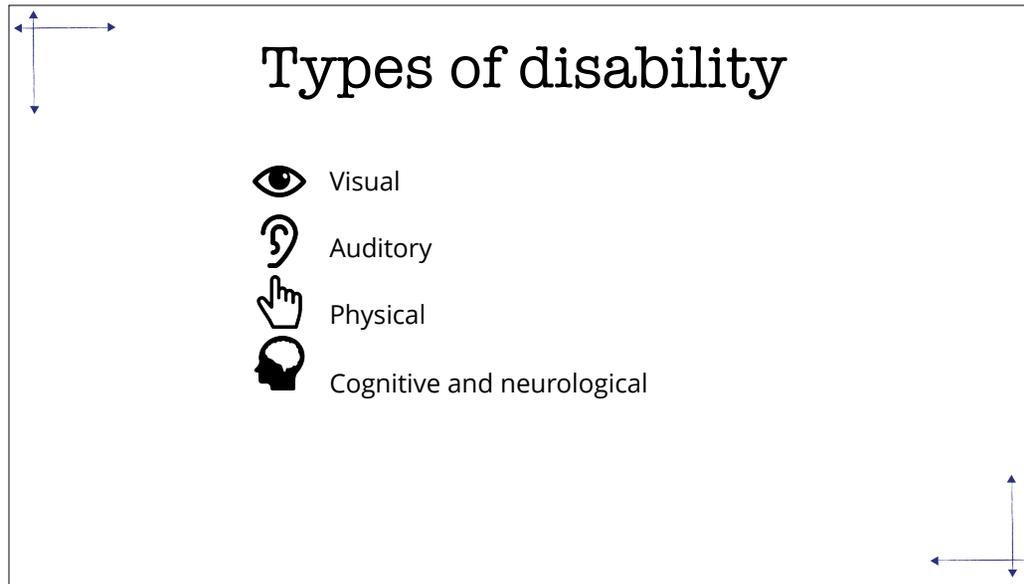
And there's no "one disability per person" guarantee.



Our definition of disability

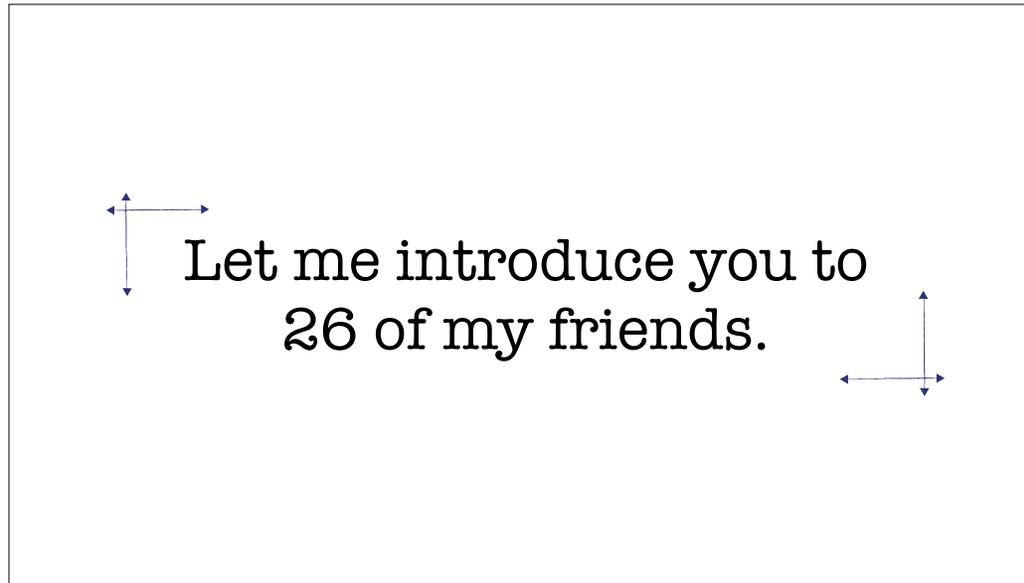
“Something about this person’s **physical characteristics** interfere with their senses and perception in a way the general population doesn’t experience.”

There are a lot of definitions for disability: legal, medical, social, and self-identifying.



Because we're mostly web folks, I'm going to concentrate on visual, auditory, physical, and cognitive and neurological disabilities.

You'll see these symbols on each profile to illustrate which of these abilities are most affected.



So let me introduce you to twenty six of my friends. Each slide will tell you a little bit about them and be accompanied by a photo.

Some of the photos are people who volunteered for these profiles. Others are represented by stock photos. All of them exist, and some of them are in this room with you.

A is blind.

- He's always used a screen reader, and always used a computer. He's a programmer.
- He's better prepared to use the web than most of the others on this list.

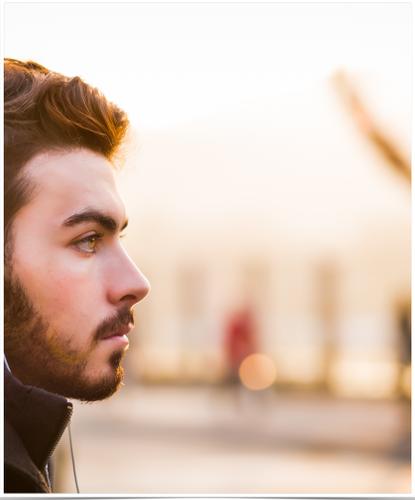
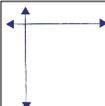


Photo by [Alex Blajan](#) on [Unsplash](#)

Some disabilities are permanent, life-altering, profound conditions.



B has Cystic Fibrosis.

- He spends a few hours a day wrapped in vibrating medical equipment.
- He prefers to use the keyboard or wait to do tasks that require a steady touch with a mouse.



Photo from video by [Megan Smith](#) on Vimeo

B has Cystic Fibrosis, which affects the respiratory and digestive systems. Shouldn't affect using the web, right? People with CF can spend hours a day wearing respiratory therapy equipment, which vibrates your chest to help clear your lungs. It's loud, distracting, and a little like trying to surf the web while riding a motorcycle on cobblestones.

C has Multiple Sclerosis.

- The disease affects both her vision and her ability to control a mouse.
- She often gets tingling in her hands that makes using a mouse for a long period of time painful and difficult.

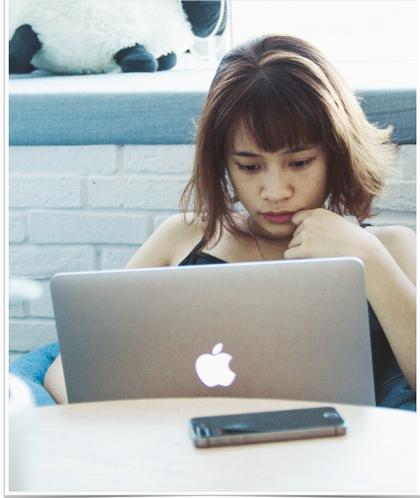


Photo by [Tran Mau Tri Tam](#) on [Unsplash](#)

The image contains several icons: a blue double-headed arrow in the top left corner, an eye icon, an ear icon, a hand cursor icon, and a head with a brain icon, all positioned to the left of the photograph.

C has Multiple Sclerosis. She sometimes gets blurry vision. Her hands tingle, and that make using a mouse miserable. MS and CF are both examples of disabilities that increase in severity over time, generally unexpectedly.



D has AMD.

- Age-related Macular Degeneration is a lot like having the center of everything she looks at removed.
- She uses magnifiers and screen readers to try to compensate.



Photo by [Nay Lin Aung](#) on Pixabay

D has Age-related Macular Degeneration. Her peripheral vision is fine but she's losing the ability to look straight at a thing. The biggest risk factor for AMD is being over 50.

E is 101 years old.

- You name the body part, and it doesn't work as well as it used to.



Photo by Catherine Cullen

The image contains a text box on the left with a blue double-headed arrow pointing to the text. To the right of the text are four icons: an eye, an ear, a hand with a pointing finger, and a head with a brain. The photo shows an elderly man with glasses, wearing a blue and white plaid shirt, khaki pants, and a dark cap, standing in front of a large bush of bright pink flowers.

E is a hundred and one years old.

He watches TV, uses the remote control, uses a cell phone, and tries to keep up with technology.

Growing old is just a thing that happens to people.

F was a preemie.

- She has low vision in one eye and none in the other.
- She tends to hold small screens and books close to her face, and lean in to her computer screen.



Photo by [Tami Hz](#) on Pixabay

The image contains several icons: a blue double-headed arrow in the top left corner, an eye icon, an ear icon, a hand icon, and a head icon with a brain inside, all positioned to the left of the photograph.

F was born premature in the 70s, and the oxygen she was given as an infant damaged her still-maturing eyes. She has low vision in one eye and none in the other. She tends to hold small screens and books close to her face, and lean into her computer screen.



G fractured his fingers.

- He fell down a hill while running to close his car windows in the rain.
- He's trying to surf the web with his left hand and the keyboard.



Photo by [Ayo Ogunseinde](#) on [Unsplash](#)

G isn't permanently disabled, but he is acutely disabled, just for a little while.

H has gamer's thumb.

- She just had surgery in her non-dominant hand, and will have it in her dominant hand in a few weeks.
- She's not sure yet how it will affect her typing or using a touchpad on her laptop.



Photo used with permission from Sarah Hopkins

She's got to have surgery, and then wear bulky wrist wraps that get in the way of everything.

I has an
astigmatism.

- She doesn't know it yet. She does know that by the end of the day she has a lot of trouble reading the screen.
- She zooms in the web browser to 150% after 7pm.



Photo used with permission from Abi Jones

The image contains several icons: a blue double-headed arrow in the top-left corner, an eye icon, an ear icon, a hand cursor icon, and a head with a brain icon.

Bad eyesight is a disability.

Everyone's Assistive technology

- 191.7 million Americans correct their vision
- Glasses and contacts are an **assistive technology**
- What if we looked at all disabilities the way we look at vision correction?



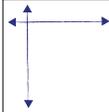
Photo by Mark Solarski on Unsplash

Almost 192 million Americans correct their vision. That's 65% of the population.

Without glasses or contacts, people wouldn't be able to do things like drive or read or work.

Most people who wear glasses don't consider themselves disabled.

Vision correction is what a mainstreamed disability looks like.



J is Deaf.

- J has hearing aids.
- She sometimes turns the volume all the way up so she can hear videos and audio recordings on the web.
- Most of the time she just skips them.

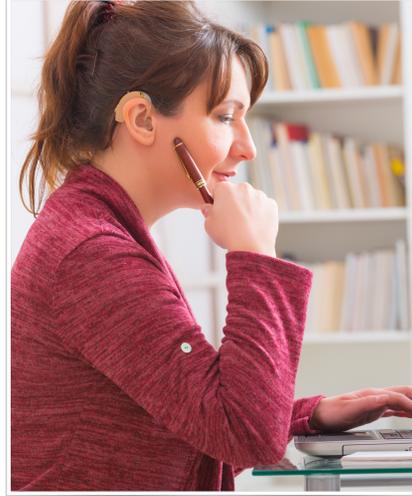


Photo by iStockPhoto



Photo by Samantha Gates on Unsplash

J is also part of the big-D Deaf community.

The Deaf community recognizes their own set of social beliefs, behaviors, art, history, and values.

Their primary language is Sign, not English.

Many people in the Deaf community don't consider themselves disabled.

Why should they? They don't need to **hear** to participate in Deaf society.

Hearing isn't required for communication - as long as the hearing community respects the Deaf community and builds for everyone.

K has lazy-eye.

- Her brain ignores a lot of the signal she gets from the bad eye.
- She can see just fine, except for visual effects that require depth perception such as 3-D movies.



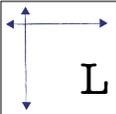
Photo used with permission from Beth Kent

The complex block contains a title, a list of two bullet points, a photograph of a woman, and a caption. To the left of the text is a blue L-shaped arrow pointing right and down. To the right of the text are three icons: an eye, an ear, and a hand cursor. Below the photograph is a brain icon.

K has lazy-eye. Her good eye points at whatever her brain says to point at. Her bad eye wanders off.

K's brain relies very heavily on her "good" eye, and ignores the input from the lazy eye.

Most people wouldn't even consider this a disability, because it has no impact on K's activities... that is, until she's asked to watch a 3-D movie.



L has Raynaud's Disease.

- When she's stressed, doing repetitive tasks or cold, her hands and feet go numb and sometimes turn blue.
- Even in August she has been known to wear gloves at her desk.

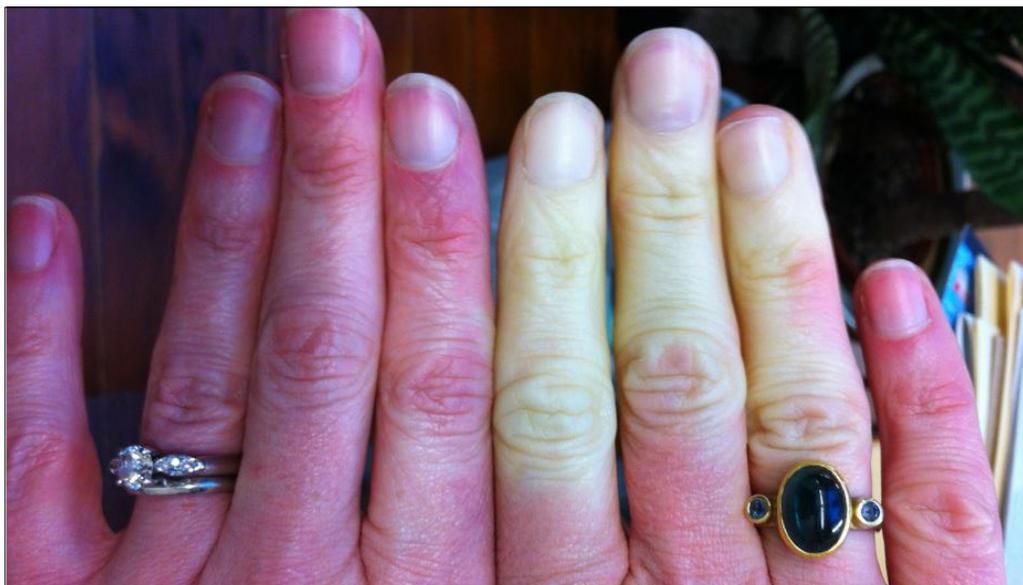


Photo used with permission from [Cyd Harrell](#)

L has Raynaud's Disease, a condition where your body decides you're freezing to death, so to protect you, it pulls all your blood flow into your core. Your hands and feet go ice cold, numb, and sometimes turn disturbing colors.

In a blizzard, we all do that.

If you have Raynaud's, it happens because you're stressed, or doing repetitive tasks, or you're sitting under the air conditioning vent at the office.



I assure you, if your fingers are red and white and freezing cold like this, typing doesn't get easier.

 M can't tell her left
from her right.

- Neither can 15% of adults, according to some reports.
- Directions on the web that tell her to go to the top left corner of the screen don't harm her, they just momentarily make her feel stupid.



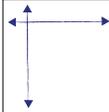





Photo used with permission from Dawn Ahukanna

This is a real thing! I was so happy to find out it was a real thing!

This is called everything from “directional dyslexia” to “left-right confusion”. 15% of us have it, mostly women.



N's deaf in one ear.

- N served in the Coast Guard in the 60s on a lightship in the North Atlantic. Like many lightship sailors, he lost much of his hearing in one ear.
- He prefers monophonic sound.



Photo by [Gus Moretta](#) on [Unsplash](#)



O is color blind.

- Most people designing websites think of him.
- Most of his co-workers, producing charts and graphs in presentations, do not.



Photo by [Paul Bence](#) on [Unsplash](#)

Colorblindness is an example of an “invisible disability” - you don’t know it’s there unless the person who has it tells you about it.



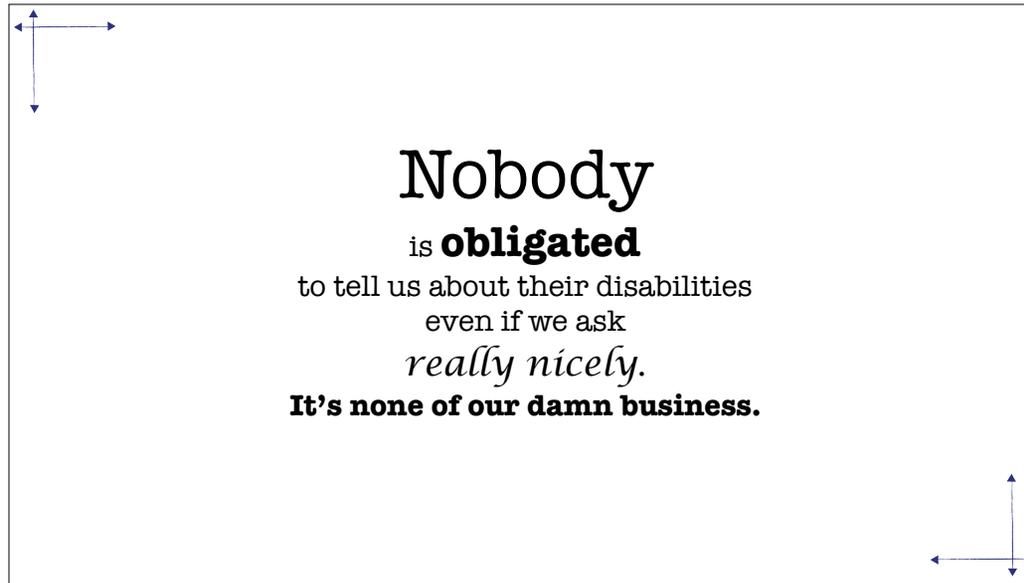
Invisible disabilities are extremely common.

We can't see dyslexia, depression, diabetes, or dizziness by looking at someone.

Many degenerative conditions, like Cystic Fibrosis, are invisible until they're not.

On the web, disabilities are even more invisible.

Web servers can't detect screen readers, special keyboards, or Braille machines.



And nobody — **nobody** — is obligated to tell us about their disabilities **even if we ask**.

So how do we know how many of our users are disabled?

We don't.

We also don't know how many are using mice versus trackballs, but we design for them anyway.

And that's what we need to do for people with disabilities.

Because whatever number of disabled users we think we have? It's higher.

P is dyslexic.

- Because of his early and ongoing treatment, most people don't know how much work it takes for him to read.
- He prefers books to the Internet, because books tend to have better text and spacing for reading.



Photo by [Muhammad Raufan Yusup](#) on [Unsplash](#)

The image contains several icons: a blue double-headed arrow in the top left corner, an eye icon, an ear icon, a hand cursor icon, and a head silhouette icon.

P has an invisible disability too.



Q has epilepsy.

- Q's seizures are sometimes triggered by stark contrasts in colors, or bright colors.
- Q has to be careful when visiting brightly-colored pages or pages aimed for younger people.

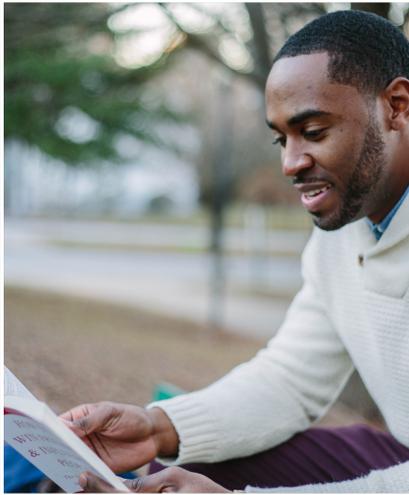


Photo by [Tamaricus Brown](#) on [Unsplash](#)

Now a lot of us have heard that flashing lights and animation can trigger seizures.

But most of us don't know that bright colors, or extreme color contrasts also trigger seizures.

Q is really glad we're putting animation controls on pages. He'd like us to do the same thing for the color palettes on kids' websites.

R has a reading comprehension disability.

- He does better when sentences are short, terms are simple, or he can listen to an article or email instead of reading it.

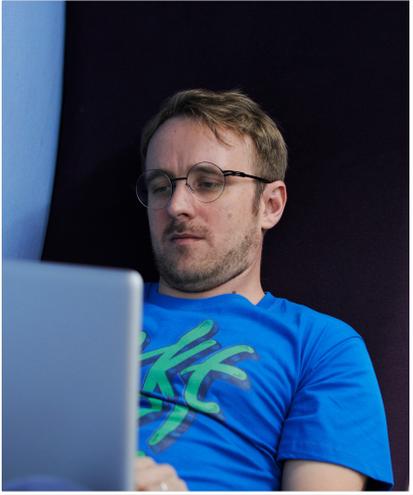


Photo by rawpixel.com

The image contains several icons: a blue double-headed arrow in the top left corner, an eye icon, an ear icon, a hand cursor icon, and a head with a brain icon.

R needs those conditions all the time. But it's also true that most of us need them some of the time.

S has post-concussion syndrome.

- It's been six months since he was struck by a car.
- He gets frequent headaches, cognitive issues, and sensitivity to sound.
- He has a lot of trouble understanding what he's reading.

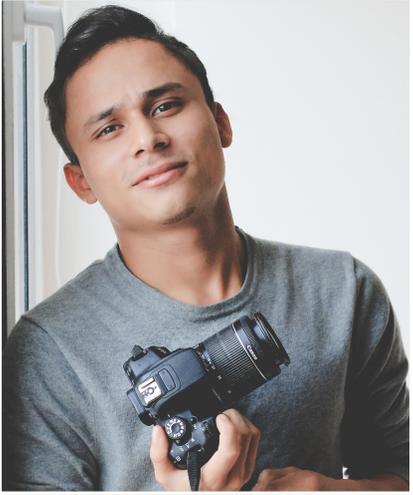
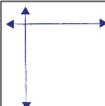


Photo by [Angello Lopez](#) on [Unsplash](#)

The image contains several icons: a blue double-headed arrow at the top left, an eye icon, an ear icon, a hand cursor icon, and a head silhouette icon.

The same changes that helped R? They help S too.



T had a stroke.

- He was surprised since he was only in his early 40s.
- Now he's re-learning everything from using his primary arm to reading again.



Photo by [Toa Hefiba](#) on [Unsplash](#)

U is having thyroid problems

- She has extremely low energy, and a lot of trouble concentrating.
- She likes things broken up into very short steps so she can't lose her place.



Photo by [Eye for Ebony](#) on [Unsplash](#)

The image contains several icons: a blue double-headed arrow at the top left, an eye icon, an ear icon, a hand cursor icon, and a brain icon.

U's thyroid is shot.

Most of us know that our thyroids control our metabolism, and by extension, our weight.

They also control our body temperature, energy levels, and our ability to concentrate.

U's on drugs to replace her thyroid's functions, but it can take months to get those drugs balanced correctly. Until then, she's going to struggle.



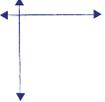
V has vertigo.

- V's vertigo and dizziness are under control, but parallax scrolling makes her nauseous until she's physically ill.
- She shuts scripting off on her computer to protect herself.



Photo by Wahyu Tanoto at Pixabay

As designers, it's our responsibility to make sure none of our users puke on their shoes when the page scrolls.



W is new to American software.

- She is a fluent English speaker but doesn't live here. She's frequently tripped up by American cultural idioms and phrases.
- She needs websites to be simple and readable, especially when the concept is complex.



Photo by [Svetlana Pochatun](#) on [Unsplash](#)

Is this a disability? Not in the strictest sense...

But all the things that we do for someone with a neurological disability will help W too.

X is sleep-deprived.

- She gets about five hours of bad sleep a night, has high blood pressure, and her doctor wants to test her for sleep apnea.
- She muddles through her workday thinking poorly and having trouble concentrating on her work.



Photo by [Alexander Dummer](#) at Pexels

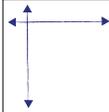
The image contains several icons: a blue double-headed arrow in the top left corner, an eye icon, an ear icon, a hand cursor icon, and a head silhouette icon.

If you want to know how dangerous it is, google “Mythbusters sleep deprivation” and start watching videos.

Sleep deprivation isn’t a disability, but it mimics the results of one.

People with sleep deprivation are at higher risk for injuries, memory issues, depression, and a bunch of other issues.

If one third of our users are sleep deprived, our websites **have** to make sense for people who are too tired to think.

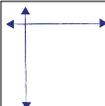


Y has twins.

- Y doesn't have a disability. He has twin boys under the age of two.
- He's a stay-at-home dad who has a grabby child in one arm and one or two fingers free on the other hand to navigate his iPad.



Photo by [QIQ Images Ltd](#) / Alamy



Z has Chemo Brain.

- She's a pediatrician on medical leave.
- She's finding it harder and harder to remember things, read, or have a conversation.
- The more reliant she is on her smart phone, the harder it is for her to use.



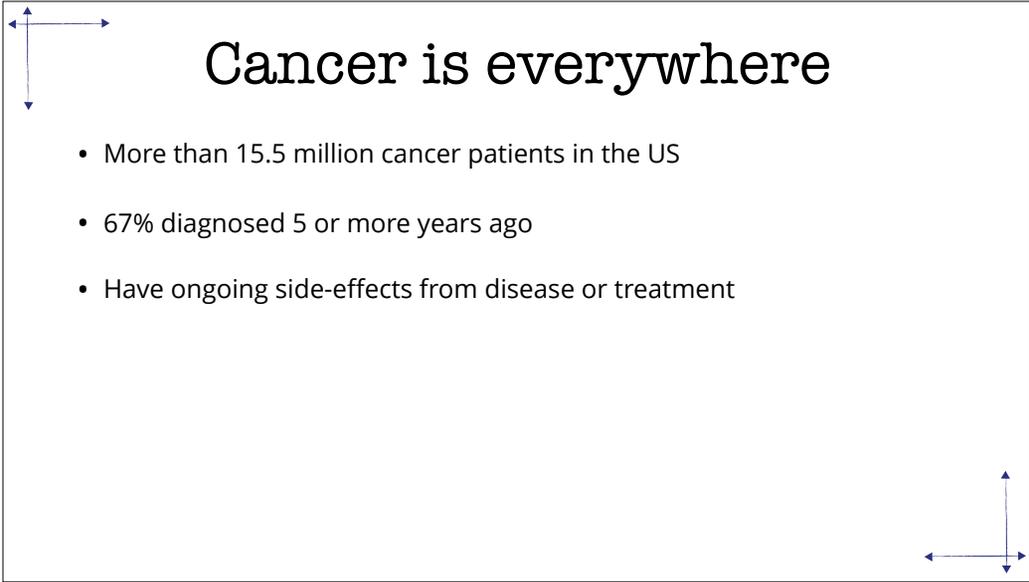
Photo by Beth Kent

Z is so many people in my life.

She's got "cancer-related cognitive impairment", or in layman's terms, "chemo brain".

People with Chemo Brain forget things, have trouble concentrating, and struggle to multi-task.

You don't have to be on chemo to get chemo brain... it affects all kinds of cancer patients.



Cancer is everywhere

- More than 15.5 million cancer patients in the US
- 67% diagnosed 5 or more years ago
- Have ongoing side-effects from disease or treatment

Cancer is one of the top causes of disability in the United States.

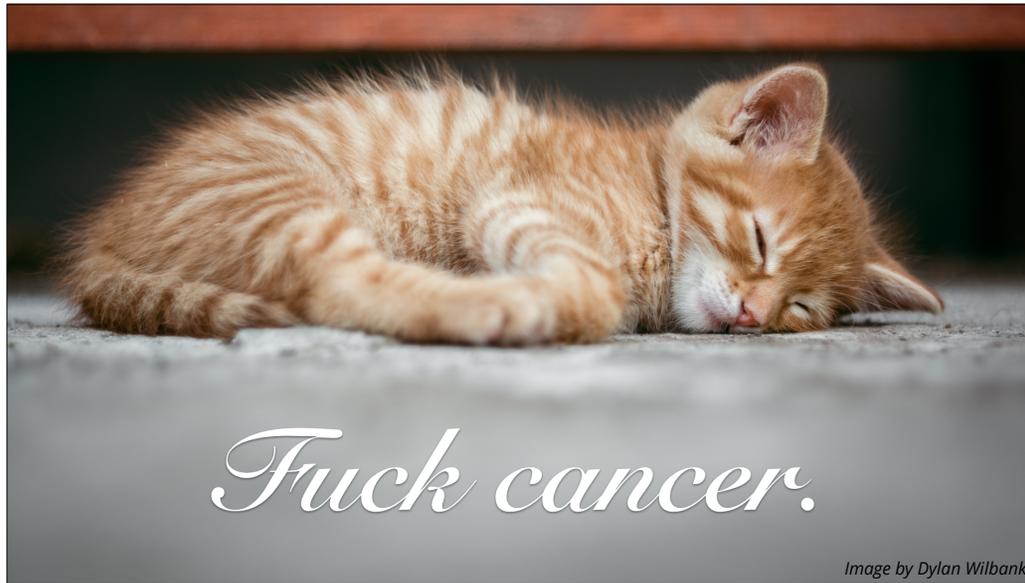
We often think about how many people it kills. Just as importantly, we need to think of how many people survive.

There are more than 15 million people living with or after cancer in the US right now.

Sixty seven percent of them have been cancer patients for at least 5 years.

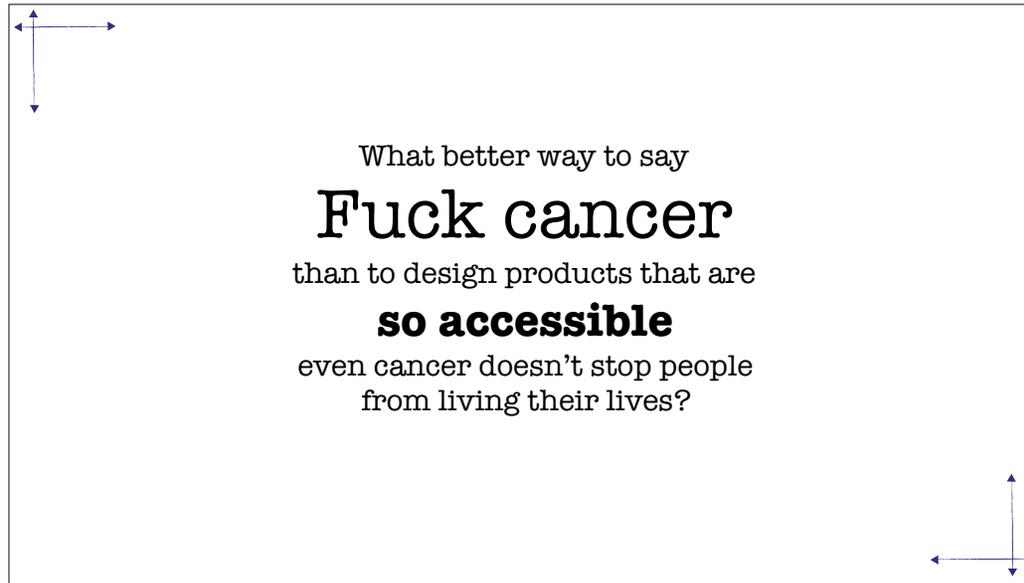
Many have ongoing side effects for the rest of their lives - fatigue, memory loss, anxiety, cognitive impairments, and pain.

Whether we know it or not, we are surrounded with people silently fighting cancer.



I say fuck cancer.

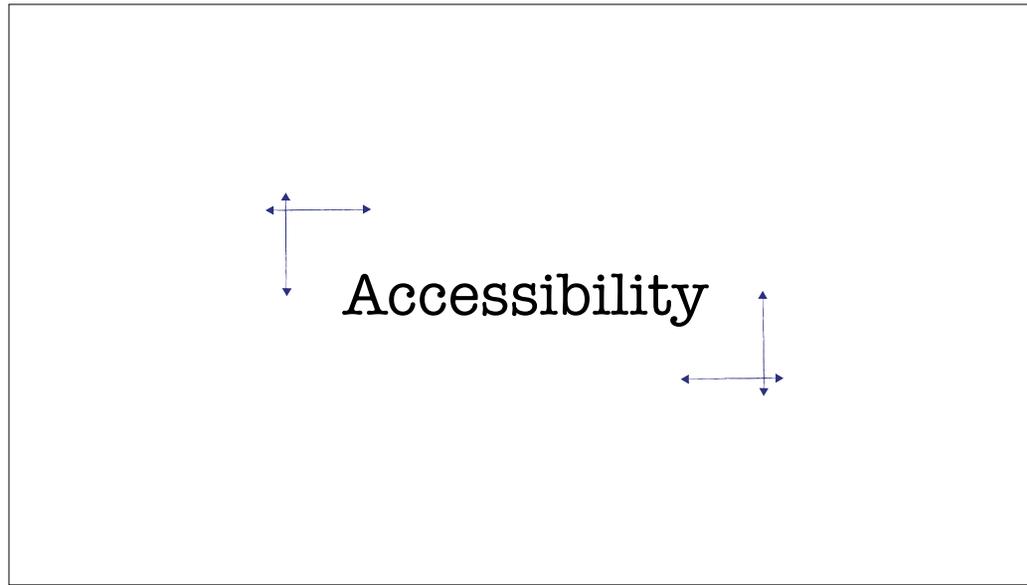
I'm tired of feeling helpless when friends and colleagues are diagnosed.



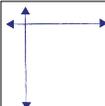
This is important work we're doing.

This is our way of making the world more useful, usable, and desirable.

It's our way of fighting against the chaos.

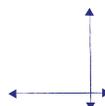


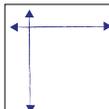
Let's go back to the beginning. Accessibility.



“The power of the Web
is in its universality.
Access by everyone regardless of
disability is an essential aspect.”

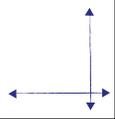
-Tim Berners-Lee, W3C Director and inventor of the World Wide Web

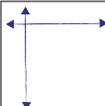




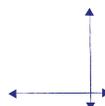
Accessibility is about access

- Provide more than one way to get information or do a task
- Assume people could be using anything to access your website
- Design for the extremes and everyone will benefit





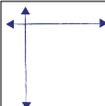
How we use our senses

-  Video, graphics, charts, written words...
 -  Audio, video, ambient music, sound effects...
 -  Input: mice, keyboards, touchpads, haptic feedback...
 -  Readability, legibility, learnability, simplicity...
- 

Let's start with providing multiple ways to access information.

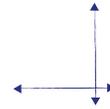
We present information in many ways on the web and in technology.

- Our eyes take in video, graphics, charts and written words
- Our ears take in audio tracks, podcasts, video, ambient music, and sound effects
- We respond physically to systems through input devices like mice and keyboards
- And we make sense of it all through the presentation of the material, how understandable and simple it is, how it aligns with our mental models and our cultural expectations

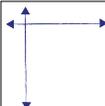


Types of inaccessibility

-  Video, graphics, charts, written words...
-  Audio, video, ambient music, sound effects...
-  Input: mice, keyboards, touchpads, haptic feedback...
-  Readability, legibility, learnability, simplicity...

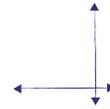


If I have a visual disability, I need access to information either through an auditory or a physical source. That might be screen reading software, or it might be a braille reader. It might be a video description track. It might be magnification of my screen. It might just be wearing my glasses.

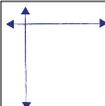


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-  Video, graphics, charts, written words...
-  Audio, video, ambient music, sound effects...
-  Input: mice, keyboards, touchpads, haptic feedback...
-  Readability, legibility, learnability, simplicity...

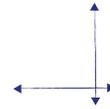


If I have an auditory disability, I might need sound delivered in different ways, like a bluetooth connection to my hearing aid, or monophonic sound. I might need a visual representation of what I'm not hearing. That could be a transcript or captioning, a video, or a graphic.



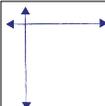
Types of inaccessibility

-  Video, graphics, charts, written words...
-  Audio, video, ambient music, sound effects...
-  Input: mice, keyboards, touchpads, haptic feedback...
-  Readability, legibility, learnability, simplicity...



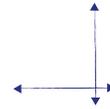
If I have a physical disability, I need other ways to provide input into the system.

I may need to be able to do everything just with a keyboard, or just with a mouse, or just with voice activation.



Types of inaccessibility

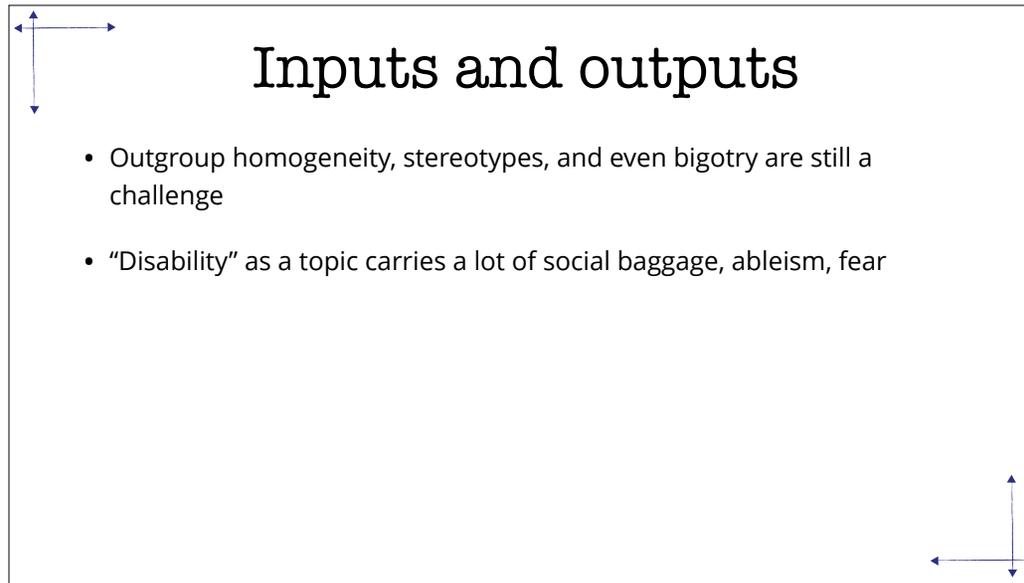
-  Video, graphics, charts, written words...
-  Audio, video, ambient music, sound effects...
-  Input: mice, keyboards, touchpads, haptic feedback...
-  Readability, legibility, learnability, simplicity...



Cognitive and neurological challenges are probably the most challenging.

But we can make our messages clear just by making a point of doing so.

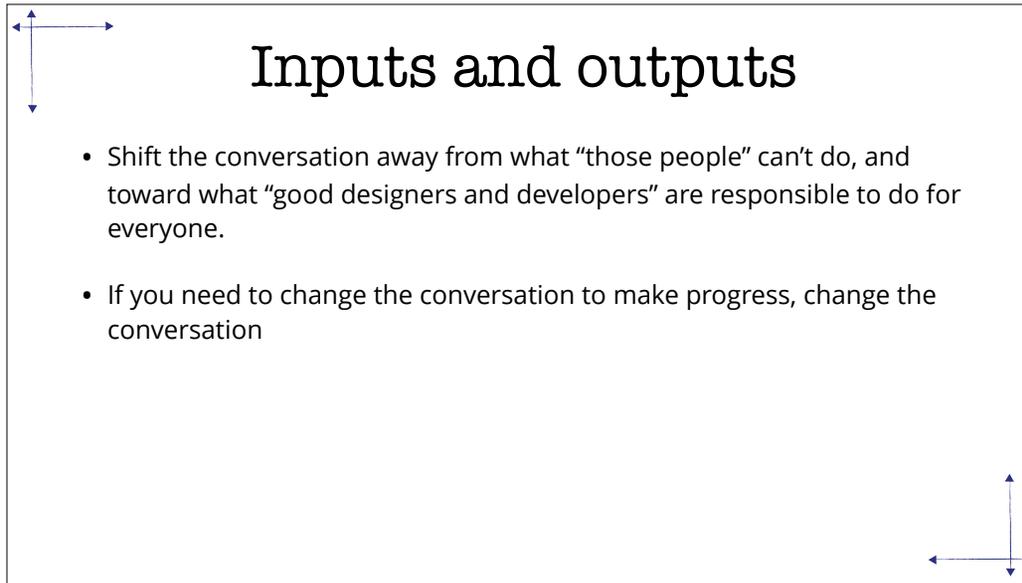
And we have all the other tools - graphics, video, auditory cues, even haptic feedback, to help us.



Inputs and outputs

- Outgroup homogeneity, stereotypes, and even bigotry are still a challenge
- “Disability” as a topic carries a lot of social baggage, ableism, fear

I’m hoping by now we’re all on the same page that accessibility is about way more than inputs and outputs, it’s about people. When we design for all people, all people benefit. Unfortunately, we live in a world where outgroup homogeneity, stereotypes, and outright bigotry are still things. There’s a lot of social, cultural, and political baggage around just ***talking about*** disability, much less persuading an organization that it’s a valuable concern.



Inputs and outputs

- Shift the conversation away from what “those people” can’t do, and toward what “good designers and developers” are responsible to do for everyone.
- If you need to change the conversation to make progress, change the conversation

So let’s look at this through a slightly different frame. Let’s take the word “disabled” and all the judgements that it carries with it out of the picture for a second, and put the problems we’re trying to solve into terms of machine inputs and outputs.

Let’s reframe accessibility to be about the quality of our work.

I don’t care why a user decided to use voice dictation software to visit my site. I don’t care why they chose to use a screen reader. Or a keyboard. Or a trackball. Maybe they were tired. Maybe they’re a paraplegic. Maybe they had a stroke. Maybe they just think it’s fun to use.

What’s important is that any designer or developer worth their salt can connect two interfaces and make them work... and they should take pride in doing that.



Inputs and outputs

	Monitor	Colorblind palette on monitor	400% Zoom on monitor	Audio output / Screen reader	Braille cell display
Keyboard(s)					
Mouse					
Microphone / Voice Recognition					
Touchscreen					
Etc...					

Today, many of our sites are designed for two inputs: keyboard and mouse, and two outputs: monitor and speakers. Challenge your team to make things more efficient than that. You should be able to do everything with just one input and one output.... but in any number of combinations.

Can I do everything meaningful on this site with just a keyboard and a monitor?

How about if I was colorblind and had a keyboard and mouse?

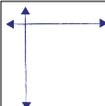
What if I needed 400% magnification?

Could I use voice recognition and a braille display?

What about a touchscreen and a screen reader?

Even if you only chose to code for and test test one combination per row or column, you'd still be way further along in uncovering problems than all your competitors who require a keyboard and a mouse.

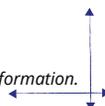
Now that's a differentiator. You've opened up entire markets of expendable income from people who couldn't use your site before. And you've probably got rock solid code to go with it.



Top 3 priorities

- Keyboard
- Images
- Forms

Thanks to Derek Featherstone and Simply Accessible for this critical information.



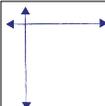
So okay, we admit we need to get accessibility right, and we know who we're building for. We've hopefully got buy-in from our teams. What are the biggest trouble spots we need to address? Concentrate on getting three things right: keyboards, images and forms.

Top 3 priorities: keyboards



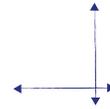
Images from enablingtechnology.com

Keyboard control is the most critical priority because most of the specialized hardware used by disabled people is specifically designed to mimic keyboard input. So if your site works on this laptop keyboard, it likely works on this expanded keyboard, this one-handed keyboard, or this mouth-stick keyboard too. That's pretty damn convenient.

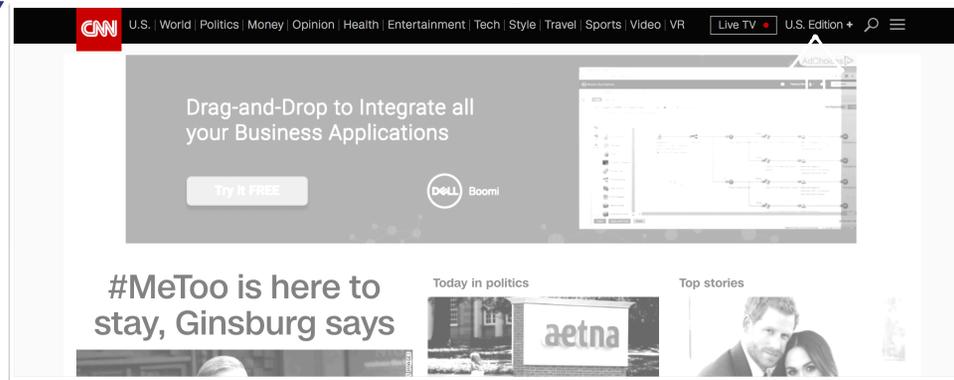


Keyboard problems

- Can't get to the controls using a keyboard
- The tab order is confusing
- Our custom components are untested



Keyboard problems

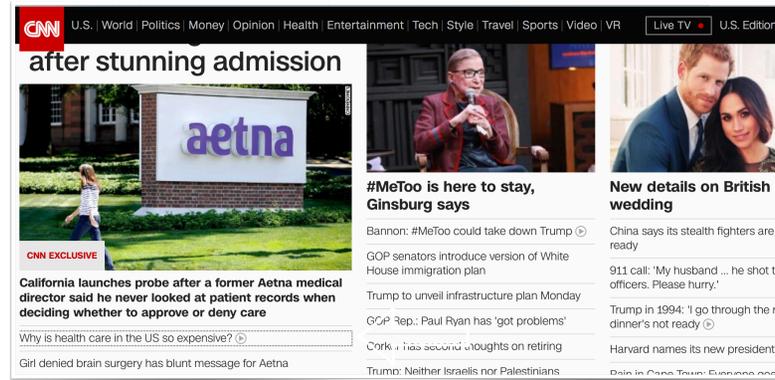


Can't navigate to an actionable item

The most frequent hurdle I've run into is when you can't get to something via the keyboard. Here's an example from a little website called CNN.

This "US Edition" menu? Try as I might, I can't get there using just the keyboard.

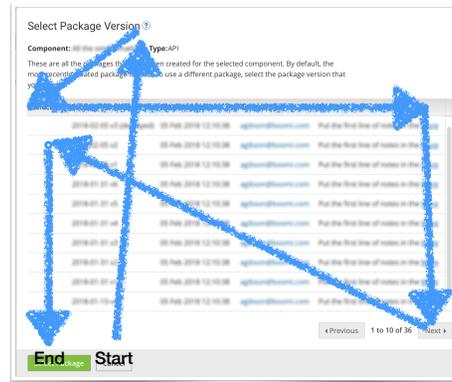
Keyboard problems



Can't find the focus indicator

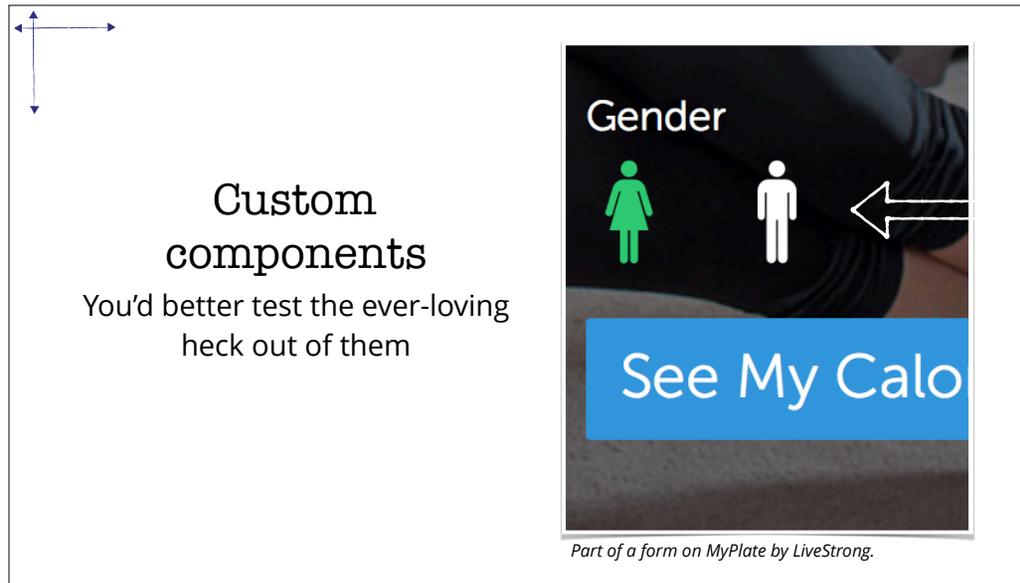
After that, it's finding the focus indicator. Focus is something you style, like Active and Hover. If you neglect it, your users will squint trying to find the dotted line.

Keyboard problems



Tab order

Then there's tab order, which is extremely dependent on the code and what gets loaded when into the DOM. Here's a dialog box with a paginated table in it. Seems pretty cut and dried. But here's the tab order. 1 is the cancel button at the bottom. Okay. Then 2 is the help icon at the top. At least we're back up top. Three through seven are the column headings... but whoops! Number 8 is the paginator below the table. 9 through whatever are the table rows and all their associated links, and then our final stop is the submit button. You don't want your tab order to look like this.



We often —and with the best intentions— create our own form fields or controls because they’re more elegant or styleable. But when we do that, we forget that we have to provide keyboard and screen reader accessibility, voice controls, and all the other things that come natively with native browser controls.

Here’s a form field on a calorie-counting website.

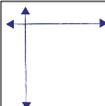
You’re required to pick your gender using the universal icons for “Woman” and “Man” you’d find on bathroom signs.

The designers could have used radio buttons and gotten all the accessibility for free.

Instead, they created their own component, and loaded the images in the background with CSS.

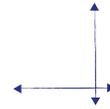
If you have a mouse, you can click your preference (thank you Javascript), but if you’re using a keyboard, you can’t navigate to them, and if you’re using a screen reader, they’re not read out at all. So if you’re in any of those situations — or if the CSS just doesn’t load because you’re entering a tunnel while riding SEPTA — well, I hope you identify as a woman because that’s what the site defaults to.

Don’t get me wrong — I have no problem with custom components, so long as they’re available for everyone to use. Test the hell out of them, and then have actual disabled people test the hell out of them.



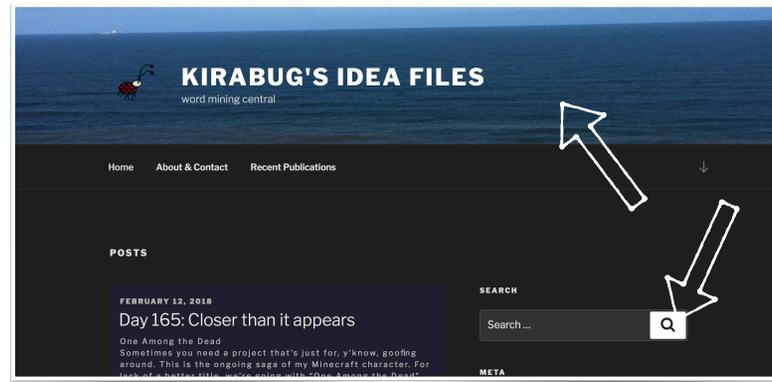
Top 3 priorities: Images

- Frequent problems:
 - Meaningful images in the background and meaningless images in the foreground
 - Font icons
 - Alt tags need to be present and meaningful



Images are another constant source of pain. We love images.
We suck at saying “What if they can’t see it?” when we design.
Our three biggest issues are :
One, we screw up foreground and background images
Two, we use font icons that screen readers don’t understand
Three, we don’t tag our images

Background vs Foreground Images



Background: If you don't mention it's there, nobody loses anything.
Foreground: If you don't mention it, somebody can't understand something.

When we use CSS to load images, they're treated like decorations, not content.

That's exactly what we want to do when something is a decoration, not content.

It's totally irrelevant that the background of my website has a beach on it. That belongs in the background.

On the other hand, this magnifying glass is the only label the Search button has, so we can't stick it in the background. (Well, we can, but we've made our own lives harder.) Images with meaning belong in the foreground.



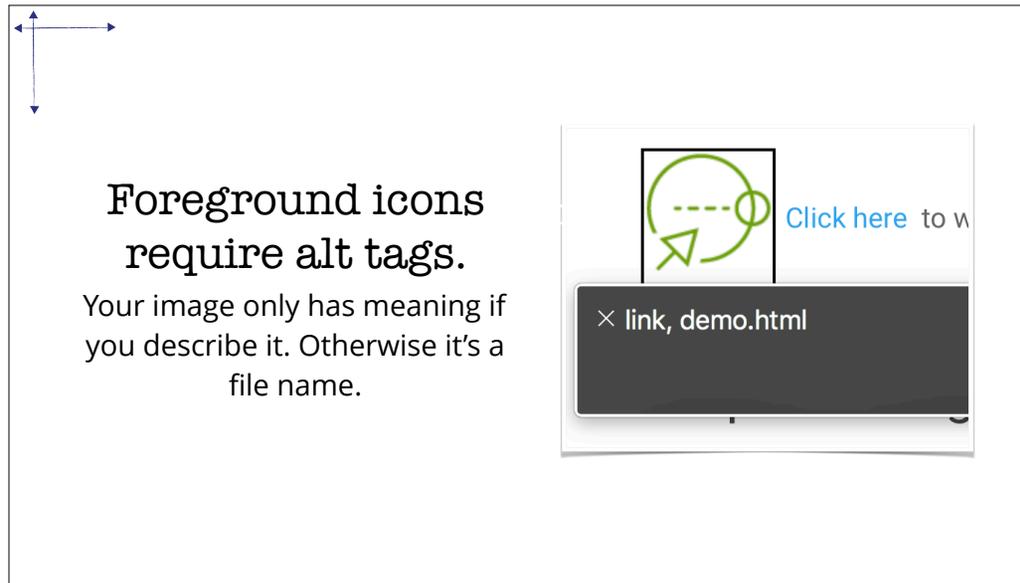
Font icons are another dangerous spot. Here's a "social navigation" bar from that same calorie-tracking site. Now, we can see icons for facebook, pinterest, instagram, youtube, and twitter.

But the icons themselves aren't images, they're font icons. They're much more performant, and unless you mark them up with a bunch of aria tags, they're crap for accessibility.

I use Voiceover for recreational screen reading. That's the grey box on the screen, telling me what it's also reading through the speakers.

Voiceover doesn't know how to read "facebook icon someone downloaded as a font" and there's no actual text in the link, so it just announces "Link!" and it's up to me to decide if I want to follow the scary unlabeled link. Five times.

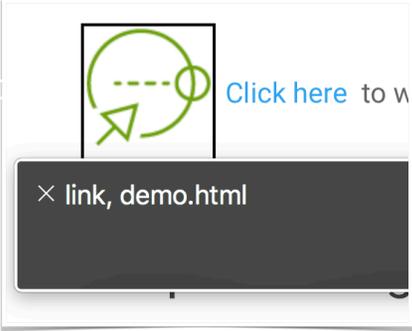
Hint: I don't.



The diagram is enclosed in a thin black border. In the top-left corner, there is a blue L-shaped double-headed arrow. The main content is centered and consists of the following text and image:

**Foreground icons
require alt tags.**

Your image only has meaning if you describe it. Otherwise it's a file name.



The screenshot shows a green circular icon with a dashed line and an arrow pointing to a small circle. To its right is the text "Click here to w". Below the icon is a dark grey tooltip box with a close button (an 'x') and the text "link, demo.html".

So if we want it to be recognized natively by the browser, an image has to be in the foreground. Arguably, this example should probably be in the background, but somebody decided it was meaningful. Fine.

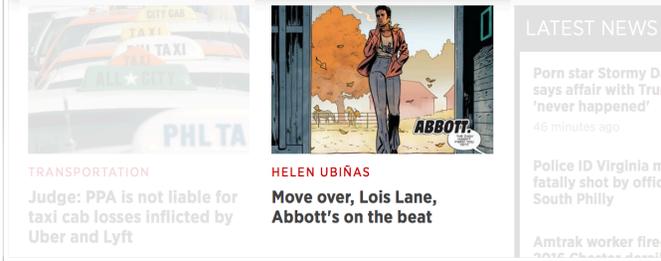
Now there's a second step: we have to describe it, otherwise it just reads out the file name.

Take it from me, some of y'all have some really ugly filenames out there for your images, and those of us who use screen readers wish you'd just stop.

If I never hear another "Help icon final December 2017 final no really final.png" read out in a global navigation, it'll be too soon. And if an image is in the foreground but it's meaningless, it is totally OK to make its alt tag an empty string.

Here's how you do it right

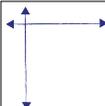
× visited, link, image, Marvel's "Black Bolt" writer Saladin Ahmed has a new comic, "Abbott," about a black female tabloid journalist. (And I love it.) The comic is set in 1972 Detroit, but is vividly



A meaningful image with a descriptive alt tag.

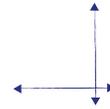
But you don't have to limit yourself to just describing the image, nor should you. Here's an example.

- philly.com is running an article on a new comic book, and there's a panel of the comic as a lead-in to the article.
- They could have captioned this "Comic panel of Abbott." It would've been accurate. They could have described the scene: "woman smoking while someone off-panel yells Abbott". But how compelling is that?
- Instead, this is the whole alt tag, which the screen reader presents when I navigate to the image:
- "Marvel's "Black Bolt" writer Saladin Ahmed has a new comic, "Abbott," about a black female tabloid journalist. (And I love it.) The comic is set in 1972 Detroit, but is vividly culturally and socially relevant."
- Now that's an intro that draws my attention regardless of my ability to make out the picture.



Top 3 priorities: Forms

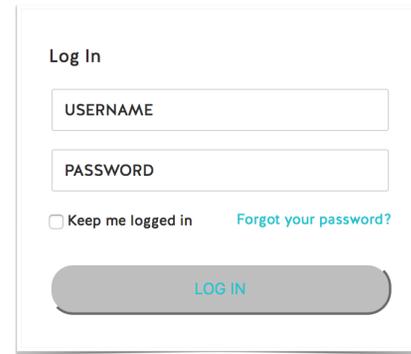
- Frequent problems:
 - Bad color contrast, size, and visual design
 - Bad labels and instructions
 - Bad error handling
 - Keyboard inaccessibility



The most frequent problems with forms are not coincidentally the most frequent problems with most other elements of web design.

Form problems

- Bad color contrast, size, and visual design



The image shows a login form titled "Log In" with the following elements:

- A "USERNAME" input field.
- A "PASSWORD" input field.
- A checkbox labeled "Keep me logged in" and a link "Forgot your password?".
- A large, rounded rectangular button with the text "LOG IN" in teal.

The form is enclosed in a light gray border. A blue double-headed arrow in the top-left corner of the slide indicates the dimensions of the form area.

That same calorie counting website we were on earlier *surprisingly enough* also has form problems.

Here's their login screen.

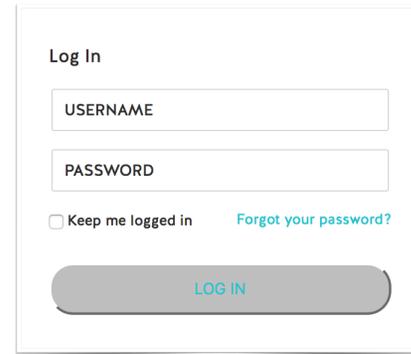
Let's start at the bottom with the button. Yeah, that label is **teal**. Colors are supposed to be a 4.5 to 1 ratio in contrast to be readable. This teal text color doesn't meet contrast guidelines for people with perfect vision, much less anyone else.

The button is huge, but the label is actually pretty tiny.

So bad visual design all around.

Form problems

- Bad color contrast, size, and visual design
- Bad labels and instructions



Log In

USERNAME

PASSWORD

Keep me logged in [Forgot your password?](#)

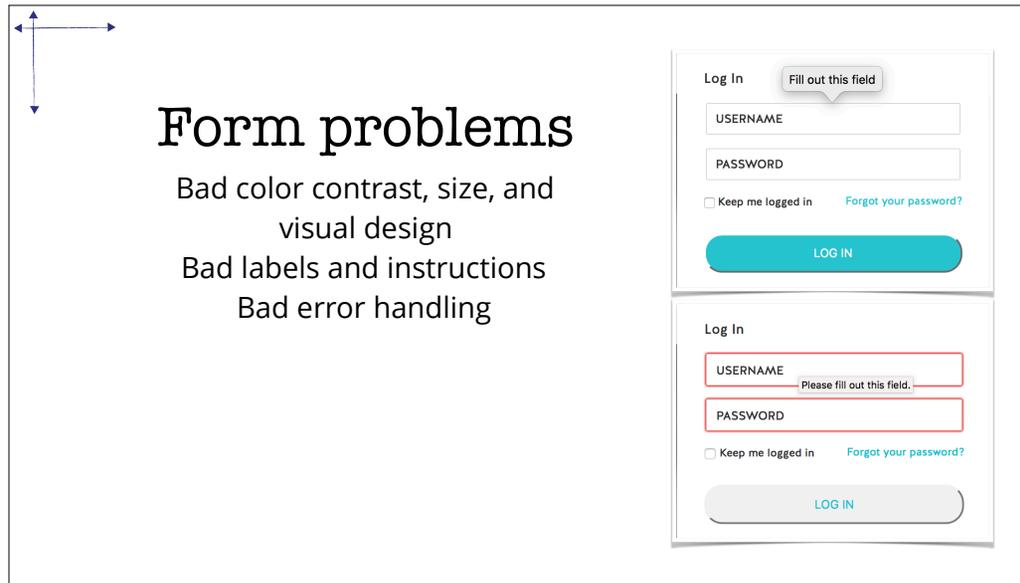
LOG IN

The labels are **in** the fields, which we might *almost* forgive on a login screen, but we should avoid this pattern in general.

Once you start typing in that field, you don't know what it was for.

If you have a cognitive disability, or a six-month old, that can mean starting all over.

And there are no instructions, so you'd better hope the you remember what you're logging into.



Form problems

- Bad color contrast, size, and visual design
- Bad labels and instructions
- Bad error handling

The image shows two versions of a login form. The top version is the 'good' design: it has a teal 'LOG IN' button, a 'Fill out this field' tooltip above the username field, and clear labels. The bottom version is the 'bad' design: it has a grey 'LOG IN' button, a red border around the username field, and a tooltip that says 'Please fill out this field.' without a 'please'.

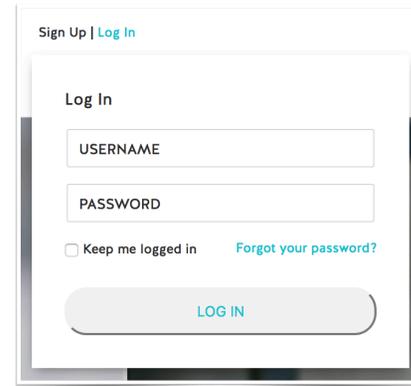
Let's say we make an error. If you start to enter a field then tab out, it'll get a red outline and on hover a tool tip to ask you to please fill out the field.

Well, except in Safari, where there's no border, no tool tip, and, strangely, no "please".

But the demand to "fill out this field" work on a screen reader... of course it doesn't say which field this field is, so, um, good luck.

Form problems

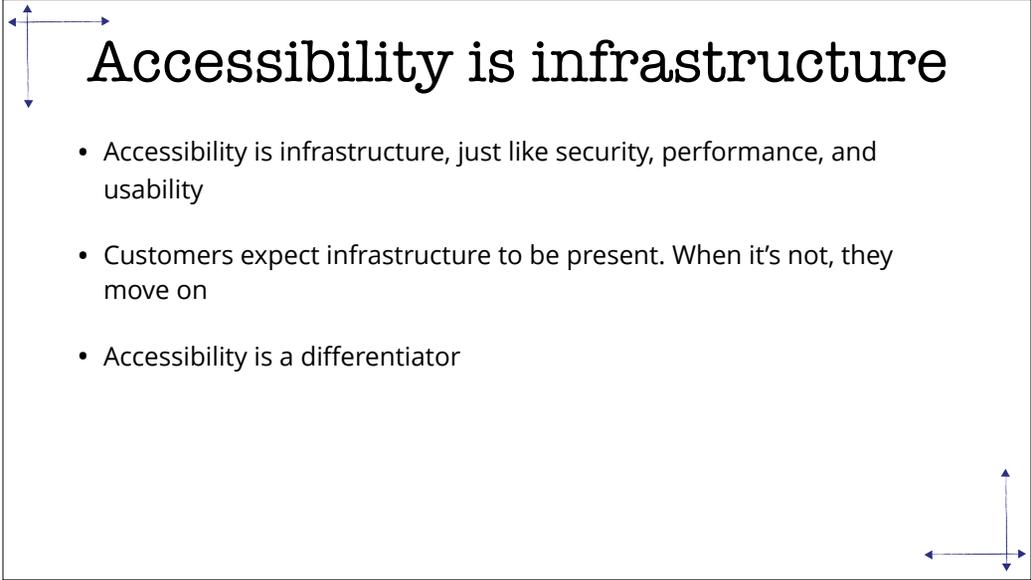
- Bad color contrast, size, and visual design
- Bad labels and instructions
- Bad controls and help access
- Keyboard inaccessibility



The screenshot shows a login form with the following elements: a 'Sign Up | Log In' header where the 'Log In' link is small and teal; a 'Log In' title; a 'USERNAME' input field; a 'PASSWORD' input field; a 'Keep me logged in' checkbox; a 'Forgot your password?' link in teal; and a 'LOG IN' button. The form is highlighted with a thick grey border, and a blue double-headed arrow in the top-left corner of the slide indicates the focus on the form's accessibility.

All of this is a moot point if you're one of the folks who can only use a keyboard, because the tiny teal Login link isn't accessible by keyboard.

If you click the link, you can tab through the form, but that doesn't do you much good if you can't click the link. Always ALWAYS check your entry and exit paths.



Accessibility is infrastructure

- Accessibility is infrastructure, just like security, performance, and usability
- Customers expect infrastructure to be present. When it's not, they move on
- Accessibility is a differentiator

What we've seen by looking at keyboard, image, and form problems is that accessibility is infrastructure.

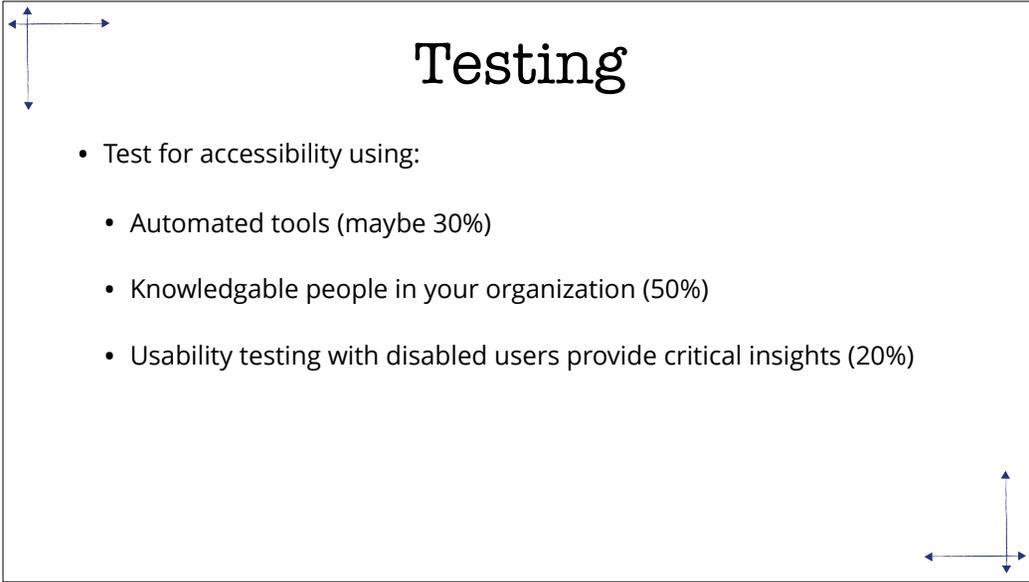
It's just like security, performance, and usability.

Nobody wants to spend time building infrastructure when there are cool projects to work on. But nobody wants to lose clients to more secure, faster, or better organized competitors, either.

Nobody wants to spend hours debugging keyboard use of a form field. But nobody wants to tell their boss that even though almost all of us own keyboards, we just didn't **take the time** to build our site to work with the tools we're using ourselves.

Customers expect infrastructure to be present. **It should just work.** If it doesn't just work, people have no reason to stay.

Accessibility is as much a differentiator as all the other infrastructure elements — it won't draw people to your site, but it will certainly turn them away. And word-of-mouth about great accessibility gets around.



Testing

- Test for accessibility using:
 - Automated tools (maybe 30%)
 - Knowledgeable people in your organization (50%)
 - Usability testing with disabled users provide critical insights (20%)

So we design with these things in mind, but then what? Just like we test our designs for functionality and usability and performance, we can test for accessibility.

Most IT managers are now hoping I'm going to mention a magical test suite that will catch 90% of the issues. Bad news: it doesn't exist.

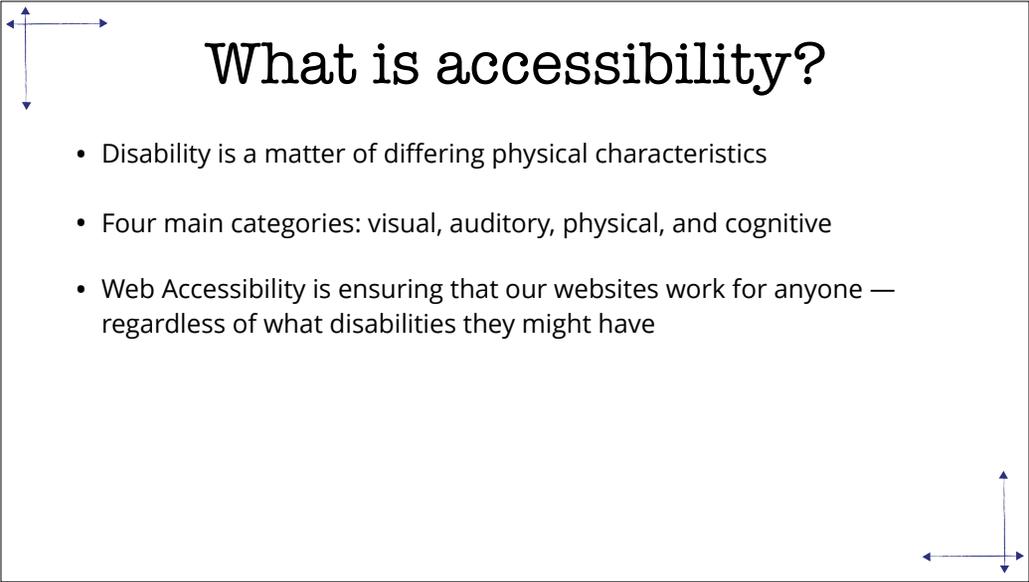
Computers haven't progressed far enough to be able to tell us if a joke is funny. They sure can't tell us whether an image description makes sense.

On the other hand, **we humans** are able to understand what works, what doesn't, and why. Accessibility heuristics are no different than usability heuristics: they can be taught and applied and iterated on.

So run your tests, and learn your heuristics.

And then ethically recruit disabled people for usability tests.

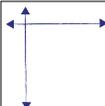
Hire accessibility consultants who have disabilities. The problems you uncover won't just be accessibility issues, they'll also be usability issues, and functional issues. If you're not sure whether something is clear, or findable, or effective, testing with someone who has a disability will uncover more problems in your design faster than any other method of testing.



What is accessibility?

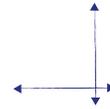
- Disability is a matter of differing physical characteristics
- Four main categories: visual, auditory, physical, and cognitive
- Web Accessibility is ensuring that our websites work for anyone — regardless of what disabilities they might have

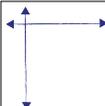
So what have we talked about?



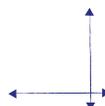
Keys to Accessible Design

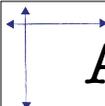
- Provide more than one way to get information or do a task
- Assume people could be using anything to access your website
- Design and test for the extremes and everyone will benefit





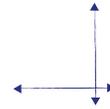
Top 3 priorities

- Keyboard - solid HTML, tab order, custom controls
 - Images - background images, foreground images, alt tags
 - Forms - visual design, labels, errors, and keyboards
- 



Accessibility is infrastructure

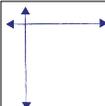
- Accessibility is infrastructure, just like security, performance, and usability
- Customers expect infrastructure to be present. When it's not, they move on
- If we have to reframe accessibility as an input/output problem and an accessible website as the outcome of strong design and development skills, we'll do it



An alphabet of accessibility

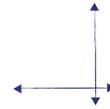


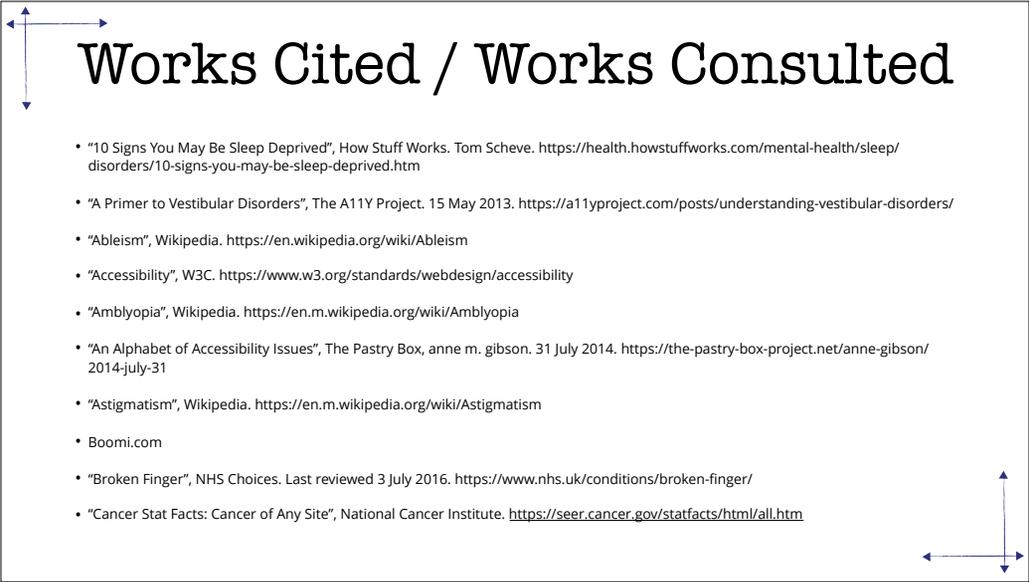
And that's our alphabet of accessibility, from A to Z.



Special thanks to

- Robin Christopherson, AbilityNet. <https://www.abilitynet.org.uk>
- Austin Seraphin, <http://austinseraphin.com>
- Derek Featherstone, Simply Accessible. <http://simplyaccessible.com>
- Dylan Wilbanks, <http://hetre.design>





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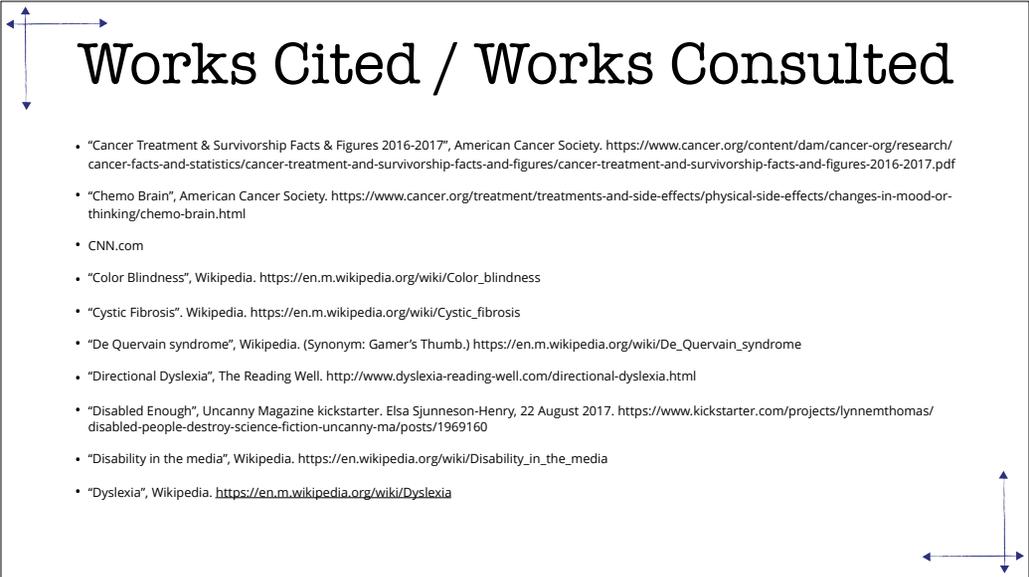
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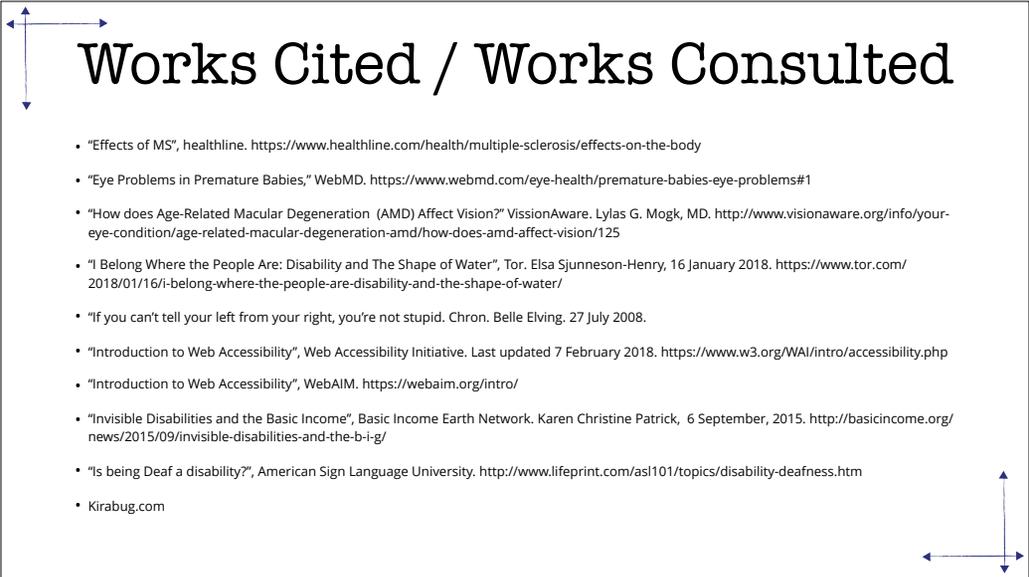


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