

WebAIM Campus Training-Session 1

Well, it's great to be here. I appreciate the invitation to be here and to talk to you about web accessibility. Just a little bit more about WebAIM, stands for Web Accessibility In Mind. As Jeff mentioned, we're based at Utah State University at the Center for Persons with Disabilities, and we've been doing web accessibility work since 1999.

So for about as long as there's been web accessibility, WebAIM has been working in this space. And we provide training, we do web site evaluations, and other types of consultation. Really, whatever people need help with in making their web sites more accessible. So I'm excited to spend today with you, and Amy, and Joel, and Alex again, went out to our training a few months ago and I put in our contract that they're obligated to laugh at all of the same jokes.

Yes.

Contractually obligated to do that. I want to make sure that I'm addressing your questions and needs so please, if you have questions, comments along the way, please holler at me. With that said, I have a lot to cover. Our standard training is a two day training and I'm packing most of that into one day today. So it's going to be a little bit of a trip. We're going to cover lots of stuff. It will be a little bit intensive, but please holler at me as you know if there's questions about what I'm presenting.

The answer to the question might be that it's something that we will cover. If it's more technical question, it's something we'll likely answer in the afternoon, but I do want to make sure that I'm answering your questions along the way. And with that, I'm just going to dive in and start.

I want to get a little bit of a sense of what I'm up against for today and who you are. So I have a couple of generic questions. This will just be-- you know, just raise your hand and answer type questions. But first of all, do you consider yourself like a web content creator or designer or somebody that creates stuff and that it magically shows up somehow on the web? Or are you more of a web developer?

How many of you would say your kind of in that first category, more of a web content creator person? OK. About half of there. How many would you say that you're more of a web developer? OK. About half there. And how many of you would say you have some other role, something else? OK. About another half. So 150% of you fit into one of those three categories, which is wonderful. I think that just tells us that we tend to wear multiple hats. We tend to do a lot of different types of things.

Some of you that maybe you raised your hand in the something else category, what are some of the roles? What are some of the things that you do? And just shout out or raise your hand, either one.

Student disability services.

OK. Student disability services, great. So maybe don't deal directly with web or technical stuff, but certainly accessibility is very important, relevant. Very good. Other roles you might have?

I do accreditation and compliance with [INAUDIBLE].

OK. Compliance, very good. OK. Excellent. Any others?

Procurement for IT.

Procurement, OK. Another really important piece when we're considering accessibility. There are a few things that are more frustrating than accessibility than being tied into a system that doesn't support accessibility and you're won a five-year contract or something like that. Good, that's wonderful. These are important people, important roles to have here. Any others that you'd like to share? OK.

So a lot of different roles, I think, and that's going to be OK. Next, rate your web development knowledge from one to five. So one being that you're not a developer at all, five being that you're really comfortable with scripting, CSS, you live in pointy bracket land. If you don't know what pointy bracket land, you're probably not a five. So how many just by a show of hands, how many of you would say that you're a one on that scale? OK, a few there. Good. Two's? OK. Three, four, and five. OK. That's almost pretty level. A few more-- little more towards the middle, but certainly very spread out across that.

OK. And then [INAUDIBLE] web accessibility knowledge. One being that you really know very little or nothing about this and five, you feel like maybe the things that you're creating right now are highly accessible. How many of you would say that you're a one? OK, couple there. Good. Two's, three, four, and five. OK, yes. Woo. All right, I was just glad to see our previous WebAIM trainees have raised their hand towards the top end of that scale. That's great. Now, my goal is to move you a little bit further along that rating there today.

So again, with that one, very, very spread out across that. A little bit of a bell curve. As Jeff mentioned, this training is going to begin with more principles, concepts of accessibility, how people access and use the web. We'll get into a little bit of some technical things so just even if you aren't a developer, you'll have a sense as to what those things do, which are important for content accessibility.

This morning-- this afternoon, we'll move into more code type topics. But because of that progression, if you're not a developer, it's going to be OK. All right. Even if you stay all day, you're going to understand these things. I've never had anyone's head explode in a training before. And if you are a developer, we will get to those more technical topics this afternoon.

So let's talk about what it accessibility is-- what this thing is. We know from the census data-- and this pretty much applies worldwide. Every time they ask people about disability, about 20% of the population has a disability. One in five, over a billion people on the planet have some form of disability. In some ways, it's one of the largest groups of people that are likely to be disadvantaged that are out there.

Of that number, if we looked at the types of disabilities, about 8 1/2% of the population has a disability that affects computer use. This is a very minimal number. It doesn't include those with cognitive or learning disabilities, which is generally-- it's up to be well above the 8 1/2% itself. Doesn't include those with colorblindness and so forth.

So you can look at that 8 1/2% and kind of think about what that means. We have to be reasonable. We have to be practical in our implementation of accessibility. I know you don't have unlimited time and resources to put only at web accessibility. We want to-- we have to be practical. At the same time, you want to have an impact. Our goal is to improve the lives of people with disabilities.

So you can look at that 8 1/2% and determine what that really means. Now, we work a lot with very highly technical groups, design development firms, things like that. Very often they do browser testing, and they do browser testing in browsers that are used by less than 8 1/2% of the population. Maybe, Safari on Mac, for instance. And why do they do that type of testing? Well, why wouldn't they?

If it's reasonable to ensure that what they're building works with that technology, why wouldn't they want to ensure that it works, even if it's a small, percentage of the population? And I think with accessibility we can take that same approach, and if it's reasonable to make sure that things are going to work, it's going to have a notable impact on that population, why don't we do that?

My focus today will be on accessibility for people with disabilities. I will highlight along the way additional benefits that come from accessibility, things that are going to make your lives easier, other additional benefits to other users, beyond those just with disabilities by implementing accessibility into your web content, and then some other advantages that come along the way.

One of those is a search engine friendliness. I'm not a search engine optimization specialist, but I know by implementing accessibility, and our clients have found by implementing accessibility, that things become more searchable. They become more machine readable.

Doodle is really blind. It can't really see your content. It's deaf. It can't hear it. It can't really use a mouse. Now, a lot of this is changing. Computers are getting pretty smart. Google can do a lot of image analysis. It can do audio, voice recognition type things. But that's still somewhat limited. But by implementing accessibility, you're going to make your things more search engine friendly because they're more machine compatible. It just-- really what Google is looking for is it's trying to extract meaning and content from information in ways that are going to be really useful and relevant, which is the same thing that we do. We're trying to get information from web content.

So by making things more machine friendly or machine readable for search engines, we also provide those benefits for users with disabilities by making things compatible with their assistive technology. So this is the definition that Wikipedia uses for assistive technology. Assistive technology promotes greater independence by enabling people to perform tasks that they were formerly unable to accomplish or had great difficulty accomplishing. So with that definition, is there anyone here that uses a form of assistive technology? Some sort of technology that due to a

physical issue or limitation. If you didn't have that technology, you'd have difficulty functioning the way that you do every day.

Reading glasses.

Yeah. How many of you wear-- just by show of hands. How many of you wear glasses or contacts? Probably 80 plus percent of you, which maybe suggests that you spend too much time looking at your computer screens. But of those of you that raised your hand, how many of you would have difficulty functioning the way that you do everyday if you didn't have that assistive technology of glasses or contacts? OK, almost everyone that raised their hand before.

So do you have a disability? That's maybe a question you haven't really considered before, but if you didn't have that assistive technology and would-- thus would have difficulty functioning everyday, kind of sounds like it. But that technology, your glasses or contacts, kind of makes your disability mostly irrelevant. I mean, you still have to wear your glasses, put in your contacts, but it doesn't really matter in the way that you function every day because of that assistive technology.

How frustrating would it be for you to come to a website that doesn't work with glasses or contacts? I mean, wouldn't that just seem incredibly mean? Be very frustrated, seem kind of arbitrary. That's the reality of many people with disabilities. We just simply need to ensure that what we're building is compatible with the technologies that they use, that they need or must use.

So those technologies would be, for instance, a screen reader that takes the text content of a web page and presents audibly to someone that can't see or may have difficulty seeing the visual content on a screen. It would be supporting screen magnification for somebody with low vision that can't be adequately corrected with glasses or contacts.

The need seems to be very large. It's providing captions and transcripts for somebody that can't hear multimedia content or audio content from your website. It's supporting keyboard accessibility for somebody that may have difficulty or can't use a mouse or a track pad. Those types of things.

And really, if you would think about that, if you implement that compatibility with those technologies, it doesn't really matter if your users have a disability. It's totally irrelevant. It doesn't really matter. You'd be totally blind and fully experience web content as long as that compatibility is built in.

But if it's not, suddenly you make that disability relevant. In some ways, there was no real disability. You disabled that user by introducing that barrier to their assistive technology. So that's kind of an interesting way to think about accessibility. It's simply compatibility with these technologies so that the disability doesn't become a factor, it isn't really relevant, at least in their accessing your web content.

Now, there are aspects of accessibility that extend beyond simply compatibility with those technologies. And I'll talk about those. Those are things that fit into the category of just good

usability, things that are going to improve your web content for everyone, and I'll highlight those as I go. Are there any thoughts or questions to this point?

All right. I'm going to ask you another question. I know this is so mean, first thing in the morning to ask you all these questions. But true or false or I don't know, my web content is currently accessible. How many of you would say true? You know enough to know that what you have is accessible. OK. How many of you would say false? You know enough to know that it's not accessible. OK. A few there. [INAUDIBLE] doing a lot of this. How many of you would say that you don't know? Not quite sure where you're at. OK. A lot there. I see a lot of this going on, and why is that? Why some of this?

I mean, I would say for the most part is because the web site that I maintain has been around for so long and there's so many pages. And there's ones where I have no idea if it's accessible or not.

OK. So you might be dealing with a lot of content, some of it might be more accessible, some of it might be less accessible, some of it is probably never been seen. You're not quite sure what's out there. Yeah, great. So yeah, that's certainly a reason why there might be a little hesitation to answer this more definitively. Why else?

It's kind of a spectrum.

Yeah. Absolutely. You know, that word accessible, what does that mean? Accessibility isn't a toggle. It's not like this threshold you suddenly reach and yay, we're accessible. We don't have to worry about that anymore. It really is a continuum. It's really a spectrum. And that's because we're talking about the human experience, and humans are incredibly diverse, especially when we consider disability, and types of disabilities, and severity of disability, that it's very, very dynamic. It really is this continuum.

And that can be a little frustrating sometimes because we want to be able to answer this question definitively. We want to say, yes, we're accessible. But that word accessible is a little bit nebulous. Anytime somebody comes to me and says, are my websites accessible? That always raises a little bit of a red flag. I don't know exactly what that means.

We have to quantify that. Accessible to whom or accessible to what level or standard? And that can often drive engineers and lawyers a little bit crazy. They want something that they can check that box and say, yeah, we're good. But accessibility doesn't really work that way. But there are other aspects of web stuff that works the same way. You know, usability, security.

We don't-- it's not like well, we thought about security, and we implemented that, we checked the box, we don't have to worry about it anymore. These are things that are continually changing, very dynamic. We need to be thinking about them all the time and trying to make progress along that continuum. And accessibility certainly fits into that same realm of something that we can continually improve on.

And for me, I love that. I love that challenge, and it is a challenge. Accessibility is not going to come easy. It doesn't come naturally. You have to think about it. You have to put some effort

into it. The cost of accessibility is always going to be a function of your knowledge. And when people say, well, I want to build something, how much more is it going to cost to make it accessible? It's impossible to really define that.

If you have no concept of accessibility it's going to cost infinity dollars. Who knows? I don't know because it's not going to be accessible unless you have the knowledge to implement it. But once you understand accessibility, you don't think that way. You don't think about what's it going to cost to make it accessible above what it would be otherwise.

We just build it to be accessible. It becomes a natural part of what we do. That doesn't mean it's free. It's going to take some additional effort to do that, but that additional effort is going to be significantly decreased as we implement that accessibility naturally into the design and development process. If our approach is to build it and then make it accessible, that is going to be more difficult. It's going to be more expensive.

I get calls about once a week from somebody that says, we're launching our web site next week, can you help us with accessibility? And at that point it's really difficult. And it's not going to be very pretty and very often not highly successful because it's usually going to take a lot of effort to tear things down and try to rebuild them to be accessible. Whereas, when clients call us and say, hey, we're very-- we're starting a new design for a new website and we want to implement accessibility, it's generally much, much less expensive and results in a much more accessible end product.

Yeah, this is a trick question. Most of the questions I'll show on the slides here, are more discussion prompting questions. Well, I've established that accessibility is about that human experience, while it's this continuum that we can get-- we can continually progress on that continuum. It's important that we have some measures of accessibility, that we can define where we're at on that continuum. And there are some measures that measures that can help us do that.

First of all is the Web Content Accessibility Guidelines or WCAG. So I'm going to say WCAG, which is if I said, Web Content Accessibility Guidelines every time, this would have to be a two day training for sure. So I'm going to spend quite a bit of time talking about these guidelines. So WCAG, Web Content Accessibility Guidelines is a standard developed by the World Wide Web Consortium, the W3Cs International Standards Body for the Web. The group that defines HTML and CSS, the technologies that we build the web with, they have standards for accessibility. This slide is out of date. I pulled it from a slightly older slide deck, and I need to update this.

So it says WCAG 2.0 on the bottom, says 2.1 is in the works. 2018, tentative release date. It was just finalized about a month ago, WCAG 2.1. So this is a finalized specification. So these guidelines are more principles based. They're based on four foundational principles of perceivable, operable, understandable, and robust. Perceivable, the user can get the content to their senses in a way that they can start to perceive it, they can start to do something with it. If the content is not perceivable, it doesn't matter what else it is. It will be inaccessible to that user if it's not perceivable.

Once you can perceive content you want to be able to operate or navigate and use that content. It needs to be understandable and make sense to the user. And then robust deals with technology, compatibility. It needs to actually work in the technologies and assistive technologies the end users are using in order to be accessible.

So these guidelines were-- version 1.0 was finalized in 1999. We've had accessibility guidelines for a very long time. This is not new. 2.0 finalized in 2008. 2.1 finalized about a month ago. So this provides some measures along this continuum that can be really helpful. These guidelines are generally the guidelines that are defined in law, and I'll talk about that in a little more detail in a few minutes.

So a little more detail about these guidelines. If they provide a measure, I think it's important that we understand how they work and a little bit about how you might measure to these guidelines. There are two primary sections to these guidelines. The first is a normative section. So I have my norm reference. For those of you that are at least of my generation might get that.

So the normative-- the normative stuff is the guidelines themselves. It does not change until we get a new version. So we recently saw a change going from 2.0 to 2.1 of the normative set of guidelines. So that's where we find those four principles. Beneath the principles are guidelines. Guidelines are very broad statements, they're things like provide alternative texts for non-text content, make things keyboard accessible, don't cause seizures, things like that.

Below the guidelines are success criteria. Success criteria are individual measurable aspects of the guidelines. That's where the rubber meets the road. That's where we measure our conformance or compliance with the guidelines. Every success criterion is signed a level A, AA, or AAA. So A, those are things if you don't meet those success criteria, you almost certainly are going to be excluding users with disabilities from your website or at least causing significant difficulty.

AA success criteria, if you don't implement those, users may have more difficulty or take more time or more frustration with your web content. Than triple-A success criteria are more of the icing on the cake. If you meet A and AA there may be aspects of triple-A that would improve accessibility for some users, but it's generally going to be accessible, but can provide some benefit. But typically, triple-A success criteria tend to be more difficult or burdensome to actually implement. May not be relevant for all of web content.

Generally, the measure that we recommend, that I would recommend to you, is A and AA, meeting all of those success criteria. So sometimes you'll hear about WCAG 2.0 or 2.1 AA compliance. To be AA, you have to also meet all of the A success criteria or requirements. So it would be A and AA. So that's my recommendation and this is also generally the threshold that's defined legally for compliance.

So that's the normative stuff. If you were to print the normative materials of these guidelines, it's about 30 printed pages, something like that. They probably added another 10 with WCAG 2.1. And then we have the non-normative stuff. So there's our non-norm. The non-normative stuff is informative. It supports the normative stuff. It helps you understand what it actually means.

But being non-normative, they can change, and they do. They do, they're updated quite often. This technology has changed. They have updated these supporting materials to better reflect the current state of accessibility of technology that's out there. There are two primary sections of non-- or kind of documents within the non-normative stuff. There is an understanding document and how to meet document. Understanding, helps you understand what the normative stuff means. How to meet, helps you understand how you actually would meet or not meet those success criteria.

In the how to meet document there's sufficient techniques. If you do these things, you've probably met the requirements of a particular success criterion. Advisory techniques, if you do these things, it helps support compliance, but doesn't necessarily ensure it. And then failures, if you do this, you probably have not met the success criteria.

Altogether, the non-normative materials are probably about 1,100 printed pages. Like, voluminous. It's huge, massive. The fact that it takes over 1,000 printed pages for you to understand WCAG 2.0 or 2.1 is probably a pretty good indication that it doesn't do a very good job of meeting one of its foundational principles of understandable, and that's certainly the case.

Because the guidelines were written to be more principles based and more technology agnostic, that means they're really fuzzy and kind of ethereal and use weird terminology and are difficult to understand. If you just read the guidelines themselves, sometimes-- usually, you won't understand exactly what they mean. You've got to get to the non-normative stuff to better understand it.

But it's huge. But it's also huge, which is good. There's a lot of reference material. There's a lot of information out there to help us better understand these guidelines and what they mean and what we need to do and how we measure compliance of our web content to those particular guidelines.

This is a little screenshot from the normative stuff of the guidelines themselves. So you can see the structure. We have principle one, which is perceivable. Guideline 1.1, which is text alternatives, then success criterion 1.1.1, which is text alternatives for non-text content. So you'll see this structure, this number structure. So you might see something like, WCAG 3.2.4, and that would be principle three, perceivable, operable, understandable. Guideline number two, success criterion number four. So if you see that numbering structure, that's how it works with the guidelines.

And then to the right, there is the links to the how to meet and understanding documents. In the how to meet document, there are the sufficient advisory and failure techniques. So there's a nice structure here that you can kind of go from the guidelines, kind of fuzzy weird stuff, down to the actual details that you might need or you could use other resources.

On the WebAIM site, webaim.org, we have a WCAG check list. It's six printed pages. So really what we've done is we've boiled a 1,000 plus printed pages that the W3C has. We boiled it down to the important stuff. WCAG for mere mortals. It's six pages. It's not the guidelines themselves, but it's the important stuff, the most common things you might run into. So if you need a quick,

easier reference, you might look at that WCAG checklist. Right now it is 2.0. We're updating it right now to WCAG 2.1.

OK. Questions about the guidelines themselves, how that works? Anyone?

I have a question.

Yes, please.

So what body creates these?

Yeah. So it's the W3C, which is the World Wide Web Consortium. So it's an international standards body. You know, Mozilla, Yahoo, Apple. It generally is an industry body that comes together and formulates those guidelines. So that's part of the reason why it took us over 10 years to get from 2.0 to 2.1 is that it's a large international body that works on these things. So, yeah. Good. Any other questions? OK.

Now, remember this is a measure of one continuum of accessibility. As such, your site can be compliant, yet still be inaccessible to some user. And that's-- can sometimes be of concern. You know, if you're worrying about liability, you know, the word compliance has come up already a few times. You know, if you're worried about that, you could actually meet the guidelines, which are sometimes even defined as the legal threshold. But if somebody still has difficulty accessing it, does that potentially open yourselves up to liability? It's an interesting question.

And to take this a step further, your site can be technically accessible, yet functionally inaccessible. And it's important that you make the distinction between those. An example I like to use is keyboard accessibility. Consider a user that has difficulty or can't use a mouse, generally they navigate a web page using the keyboard or technology that simulates the keyboard. On the keyboard, you can hit the Tab key to navigate through links and form controls, interactive things within a web page.

So I want you to think for a minute about your web page, or a page that you're familiar with, something you've built or that maybe you use every day. How many times would a keyboard only user need to hit the Tab key on that page to navigate from the top of the page, maybe past the logo, navigation.

Maybe there's drop down or flight out type menus so they would need to navigate search, maybe a sidebar before they get to the main content or main functionality area of that page. It might be a few times. It might be a lot of times. We've seen as many as 600 navigation items with a complex dropdown fly out type menu. 600 times, the user would have to hit that Tab key to navigate past that before they get to the good stuff on that page, and on every single page on that site.

So is that technically keyboard accessible? Yes. All right. I like to think of a colleague that we had. Had paraplegia. Very limited mobility below the neck. He used a stick in his mouth to navigate via the computer. Would he hit-- with using the stick in his mouth, would he hit the Tab

key-- whatever number you came up with for your site-- that many times? Would it technically be accessible for him? Yeah. Functionally, is he going to do that? I don't know. Certainly not 600 times. He's going to abandon that process.

So we need to think about the actual user experience. Well, and just remember that accessibility, the end user experience is more important than compliance. We want to use the guidelines as guidelines, things that help inform a better end user experience, but don't ensure it. We want to focus on the end user experience. And that's really going to be my focus. I'm not going to go point-by-point through all of the WCAG 2.1 things. I'm going to focus on the end user experience, and then we'll kind of overlay the guidelines on top of that. Any thoughts, questions about the guidelines, at least for the very high level? OK.

Well, take just a few minutes. This is the really depressing part of the training. We're going to talk about legal stuff for a few minutes because it is very important. So there are a few aspects of law that are going to be relevant. One is Section 508. How many of you are familiar with Section 508? Or at least kind of heard of Section 508? OK. Quite a few of you.

For how many of you is Section 508-- how many of you are covered by Section 508, Section 508 is something that's relevant to you? This is kind of a trick question. Really, Section 508, the law, it's part of the Rehabilitation Act. It applies to the federal government. So you guys aren't federal government so Section 508, the law doesn't apply to you. But, it does in a roundabout way. We need to make a distinction between Section 508, the law and then the technical requirements of Section 508.

If you receive federal funding, very often it's a condition of receiving federal funding. The federal government says, well Section 508, the law applies to us. Therefore, because we're providing you this funding, you need to meet the technical requirements of Section 508. That doesn't mean that Section 508, the law applies to you, but contractually there's that requirement that the feds are requiring of you. If you want to provide things or sell things to the government, they need to be 508 complaint because the government has that requirement to purchase compliant things.

Many states have adopted Section 508 as state law. Does Michigan have state law for accessibility? I'm not aware.

I don't think so.

Yeah, I don't-- I don't-- I didn't think so. I don't think there's state defined technical guidelines, but many states have. So anyway, Section 508 is pretty important, primarily because it's really one of the few places in federal law where a measure has been defined, where there are technical standards defined.

As such, it tends to be referenced a lot of other places, even places where the scope Section 508 itself doesn't apply. And it was updated January of this year to incorporate WCAG 2.0 A and AA. In other words, if you meet A and AA of WCAG 2.0, you'll have met the technical requirements of Section 508 for web content. Section 508 applies to more than just web content.

It's all information technology. So phones, faxes-- faxes, who uses faxes anymore? Computers, hardware, things like that are covered by Section 508. Web is just one component of that.

There also-- just a real quick definition there of VPAT. V-P-A-T is Voluntary Product Accessibility Template. This is a standardized template, whereby vendors can document their compliance with Section 508. So if somebody was from procurement, right? So a VPAT can be a mechanism where the vendor can kind of self-identify or self-document their compliance with these guidelines.

Now, WCAG A and AA. So if you hear that, VPAT-- now, I wouldn't recommend that you guys do a VPAT. That's not a-- it's not the best way for you to say, hey, our website's compliant or accessible. But if you're purchasing something, then you can ask of that vendor, can you provide this formalized template so we can-- at least so you can state where you're at with compliance.

Trust, but verify. A lot of people that are selling software, things like that, don't have a good understanding of accessibility or Section 508 and may not be very complete or thorough or accurate in their VPAT, their declaration of compliance. So you'd want to do some testing there as well. Questions about Section 508? OK.

And then we have the Americans with Disabilities Act. So the ADA predates the web. The word web, the word internet, does not appear anywhere within the ADA. This is civil rights law. It just says, you can't discriminate based on disability. There are three areas or titles within the ADA. There's employment, is title one. Don't overlook employment. There is no question of the applicability of the ADA to employment.

If you developed a disability and you couldn't do your job because of the inaccessibility of systems that you're required to use, does that sound like discrimination? I'm not a lawyer. I did stay at a Holiday Inn last night. I'm not a lawyer. I really did, actually. So, but-- I don't know, sounds like it to me, right? So you know, employment clearly is covered by the ADA so think about that. Very often, we first think about like our public facing website, or student things. Don't overlook internet systems, things that are internal because that's clearly covered by the ADA.

Title II is State and Local Governments. You firmly fit into that category. That's definitely-- I think where you're going to fit. And then Title III is Public and Commercial Facilities. Very often they use the term, places of public accommodation, places where the public can generally congregate. Museum, shopping malls, this building, things like that would be covered under Title III.

So the question for a long time has been, is the web covered by the ADA? Does it fit into this place as a public accommodation? And generally, the answer is-- especially more recently, has been yes. The federal government, the Department of Justice that enforces the ADA has clarified that. They said, yes. The web is covered. In other words, an inaccessible website can be considered discriminatory under the ADA. What they have not yet done this define in a technical standard so we know what that means. They haven't defined a measure.

I equate this to being pulled over and given a speeding ticket on a street that has no speed limit signs. Well, why did you pull me over? Because you were going too fast. Well, what's too fast? It's whatever I determine it to be. And that's a situation, actually that we're currently in-- is we're seeing lawsuits, we're seeing complaints, and those can really require any implementation, any threshold of accessibility on any timeline that they want because this has not yet been defined by in the law itself as to what is the threshold. What does it cover when it comes to websites?

You know, my wife's Etsy shop, is that covered by the ADA? I don't know. If she owned a small home business, there would be no requirement for her to put in a wheelchair ramp until she reaches a certain threshold of employees or size or things like that, then suddenly certain requirements come into play. That has not yet been defined for the web. It needs to be and we're working on that, but doesn't seem to be any progress in the federal government right now to do so.

With that said, almost all of the lawsuits we're seeing, all of the complaints through the Office of Civil Rights, are requiring WCAG 2.0 A and AA. So another reason why that's the threshold that you need to look to is because that's what's being required. So look at it. That's really the threshold you need to define, especially if you're trying to minimize potential liability-- is looking towards those deadlines.

So a few other words on that. What we have seen to date, generally has been WCAG 2.0. Because we do not have technical standards defined within the ADA, there's nothing that would stop those that are suing or filing complaints from asking for or requiring WCAG 2.1.

So you probably need to be looking at WCAG 2.1. I'm just waiting. I think it'll be any time now we'll start to see-- because WCAG 2.1 is now the finalized international specification, and the gold standard for accessibility, we likely will start to see lawsuits requiring it in the very near future. So you want to be ahead of that curve. You want to be looking at 2.1.

A few things you can do. Just looking at liability, minimizing risk. A few things I would recommend. One, have a policy and an implementation plan. I don't know if you have this yet or not, but have things well defined. Where you're at, where you want to get to, and how you're going to get there.

If a lawyer knocks on your door or there's a complaint with the Office of Civil Rights, very often when they come to you, they'll say, somebody is having accessibility issues with your stuff. This is a problem. What are you going to do about it? You can say, we have a policy in place. We have an implementation plan. This is where we're at. This is where we're going. This is what we're going to do about it to make it right. Very often, if it's reasonable, they'll say, carry on. If you don't have those in place they will be implemented for you. And very often, those timelines and requirements are very stringent.

We have worked with a school district that has 32,000 employees and they were required to provide training for everyone within 90 days. And 32,000 employees in 90 days, basically had received web accessibility training. They had really tight timelines on-- I mean, they had hundreds of school web sites, and they had 90 days to perform audits. They had really short

timelines to implement accessibility, and it was suddenly became the house was burning down around them, and you don't want to be in that situation. Having a policy and an implementation plan is important.

Another thing that you can do to minimize some of the risk of complaints or lawsuits is to, at a minimum address the automatically detectable errors on the most prominent pages. Very often, what we're seeing with these lawsuits and complaints is that people will just run automated scans and they see errors, they assume that means noncompliance and accessibility issues and will just file a complaint or lawsuit. So that's another consideration-- is just removing some of those automatically detectable errors.

With all of that said, the best approach is just accessibility, actually making things so that they work for your users. Those are a few things you can do to help address that and at least get you going in the right direction if you're not already going there. I'm sure you guys are already doing a lot of things for accessibility, so hopefully you're well ahead of that. OK, that's pretty depressing stuff. Questions about the legal aspects of accessibility?

One question about that school with all the training. So what would be the benefit of giving accessibility training to 32,000 people who are not making web sites?

Yeah, that was a lot of the argument and the Department of Justice said, well, most of the teachers absolutely were creating-- were providing URLs, they were providing online resources. And so that was actually required just so there was some awareness of accessibility, even if they weren't like web masters, web developers. I mean, the web is so ubiquitous now, I mean it's-- I think you would probably be hard to find anybody that teaches here that isn't using some aspect of the web, even if they don't have a web page or website themselves that they're managing. Good. Any other questions? OK.

So there's a little bit of foundation of a little bit of what accessibility is and the technical and legal stuff. Let's now move to the user experience. How do we actually start to implement accessibility for our users? I'm going to start with auditory disability, deafness, and hard of hearing. Someone may have difficulty or can't hear audio content from a web page.

A few really pretty straightforward things that we need to do. First of all, provide captions for video and for live audio. So you have a YouTube video that has audio, if somebody can't hear it, you can provide captions for that. So the captions are the text that appears on the screen as it's spoken. So somebody that's deaf or hard of hearing can see that text and get the content that way.

If it's a live audio-- so it's anything that has audio that's being streamed live, if somebody on the other end can't hear that audio, you would provide live captioning. So text that's basically streamed in real time with that media so they can see the text and read it that way. And then provide text transcripts for all audio content.

So the text transcript allows the user to read all of the text within that media one time so they can get all of the content that way. That would be relevant for videos as well as like MP3 files,

podcasts, things like that. If I can hear the audio, I can read the text. So pretty straightforward. Not so actually easy to do.

For how-- how many of you is captioning and transcription a pain point, something that you're dealing with or struggling with? OK. A handful of you. OK. The primary issue with this is the transcription, getting text from the audio. And that's where the cost comes in and the difficulty.

There are three primary methods for generating transcripts for media. One is to simply type it out, which can be very accurate, but slow. Few people can type the rate that people speak, but can be also generally, less expensive because it doesn't require a lot of technical skill. You could hire a student to type out the transcript. Another method is to stenography.

So a stenography machine has a phonetic keyboard, like a court reporting machine. Allows users of that to type very quickly, at the rate that most people speak. So it can be very accurate, very fast, but it's also expensive. It requires professional expertise to use that technology. And then a third approach-- by the way, stenography is typically used for real time captioning. You can turn on the captions on the evening news, on your sports ballgame, right? You can see captions, they are generated in real time or near real time. They usually come at or shortly after-- when that content is spoken.

The third approach is voice recognition. The voice recognition, it's always accuracy is always the difficulty or question there, but it can be free or inexpensive. There are two primary techniques for voice recognition. One is to have software on your computer that you speak into a microphone and it converts that into text. That can have pretty high levels of accuracy because that software can be tuned to your voice in the way in which you speak.

Another approach is to use something like YouTube. YouTube has voice recognition technology. You can upload a video, it will analyze the audio and automatically generate captions and transcript with varying levels of accuracy. You maybe seen like the YouTube captioning fails videos where the captions sometimes are just gibberish. They don't make any sense at all.

Now, the quality of this is improving, and significantly improving, and has in the last few years for sure. But it's still a question of accuracy. If you have very clear, well enunciated English audio, then you can get very high levels of quality, 98% maybe. If there's background music or noise or multiple speakers or any other factor there, then the quality is going to decrease. And that's going to take time.

You're going to have to at least listen to that. Say you have an hour long lecture, you're going to need to listen for an hour and look to the captions just to see if they're accurate, let alone the time to go in and actually fix those. So there still is a cost involved with these.

There is something called a shadow speaker. This is sometimes even used for real time captioning. So a shadow speaker will have software on their computer, voice recognition software. They'll speak into a microphone. Sometimes it actually is like a cup shape over their mouth so people can't hear them as they're speaking, and they would speak everything that they hear.

So they can listen to video or listen to say a lecture in real time, repeat it into their voice recognition software to generate that text. That text can be accessed in real time or can be used to generate the captions or transcript for the media after the fact, when it's posted online. So again, accuracy is really the issue with voice recognition.

All three of these techniques work. All of them have their benefit. Talk about the rule of 2/3, cheap, fast, or quality and you can pick any two. All three of these, you get to pick two. You never get all three with these. But this-- but they work. These are the mechanisms. They're available. If you're dealing with any sort of volume of multimedia and captioning and transcription, generally it's better to outsource that because you get a price discount with volume.

They're one real recommendation-- do you guys have-- is there a centralized system for captioning here? Do you know? No. OK.

We just recently had a third party agreement that we're just starting to--

Good.

--figure out how to use our very limited resources.

Yeah. Yeah, this is you know-- that's great. Yeah. If I had a recommendation, it's centralized. Just be-- especially which has the lowest price savings. In Utah, we actually have a state wide captioning system. So all higher ed, all K-12, all government, everybody within the state that falls under the auspices of state government, we go through a centralized captioning system and we're saving millions of dollars just because of the price discounts of volume.

Plus, it provides a unified mechanism for generating captions and a unified system for the end users to get those captions. You're in K-12, government, higher ed, you're getting the captions the same way. And we have multiple vendors that all kind of price bid against each other to keep the price down.

So you mentioned the cost. There's a certain-- this is not free. It's one of the more expensive aspects of accessibility. With that said, media production is always expensive. It always is. We need to just kind of factor this in as a cost of generating the media. I found that captioning and transcription, because there is a cost there and because you're thinking about how that content will be generated in a text form, generally results in better multimedia.

You can take-- instead of saying, wow, I've got an hour long thing I need to generate captions for, well, can you say the same thing in 10 minutes? Maybe so. It generally results in better media if you think about it that way.

So that's-- again, two points. Pretty easy for me to stand up here and tell you, you should do this. Not so easy for you actually to do, but there are some great mechanisms out there. If you're doing just a little bit of media, you know, you have you have a 10 minute video you want to post online, YouTube is a really good resource for that if you have pretty good audio.

You can upload it. Does voice recognition. You can go in and you can edit those captions, tweak them, improve the accuracy, add punctuation, and very often that can be very, very efficient. Shows their voice recognition is getting pretty good. Yeah. That's a great way if you're dealing with just a little bit of media. Not so much if you're dealing with hours and hours of it. Yes?

I may be mis-remembering, but wasn't one of the outcomes of-- I think it might have been MIT, a lawsuit, Harvard lawsuit was that YouTube captioning isn't good enough.

Yeah. Well, one thing that's interesting, in WCAG, in the guidelines themselves, there's not a quality measure. There's not a quality standard. Doesn't say you have to be 98% accurate. Says you have to be equivalent. Has to be useful, meaningful. Has to be accurate. Which, I don't know how you define that exactly.

But I think that suggests a pretty high level of accuracy. But there was, yeah. There was recently-- in fact, there's been a couple of these where basically, they were doing like voice recognition transcription. There was no human check on that. They were just posting it online, and it was shown that yeah, the accuracy was not sufficient to where-- for the most part, it was useless in the law-- I mean, it's not that it's missing, if it's inaccurate that's almost worse, because you can get the wrong information. So yeah, if you're going to do the voice recognition or even human transcription, you probably want to verify that for quality. Yes?

Yeah this is a piggy back on that. So if you upload a video to YouTube, YouTube will try to caption it for you for free and so I think you can't rely on that.

Yes.

Now, if you go in and we do this is in UMC and we let YouTube take a shot at it, and then we do all the editing and everything, then we're in compliance. But if we just said, oh, YouTube does something, that's good enough, that's not legally good enough.

Yeah. Usually so. Again, because there's not a quality standard-- I mean, if it's a talking head really good audio, YouTube might be OK, but even then, very often it misses punctuation. Just take the time, listen to it. They have a really, really cool interface for editing their captions. It's just really slick.

We have a cheat sheet on the WebAIM site for YouTube captioning. Just-- it's one page, here are the basic things you need to do to go into the interface to take the automatically generated transcript and fix it, clean it up to make it higher accuracy. Yeah. Good. Any other comments or questions on captions and transcripts? OK. Yes?

So at this point, if we have like, 78 YouTube videos, are we going back to edit things or do we just start from this point forward?

I probably can't answer that question for you. I mentioned before being reasonable. What you would probably want to consider is the impact of that media that's not being--

Maybe the ones that are most popular.

Yeah, maybe so. I mean, let's say, we worked with schools and thousands and thousands of hours of archival video, most of which is very rarely accessed. Doesn't make sense-- especially considering the notable cost of captioning and transcription to go back and do that. Probably not. That accessibility capital can probably be better utilized in other places.

So yeah, maybe start with the ones that you know would have a higher impact, that are more accessed. With that, as part of that policy and implementation plan, you would also want a mechanism in place that if you need to provide captions or transcripts for any of that media, that there's a mechanism in place to do that in a reasonable time line. So if somebody requests it, says, hey, I want to access this, it's not captioned, there's a mechanism in place to do that would be important. Good. Good question.

I think the important point there is that you know. You're defining. You have a sense of what is compliant, what is caption, what is not, and then have a plan for that. Good. Other questions, comments on this?

I want to introduce another quick point here, and that's audio description. So captions and transcripts are for users that are deaf or hard of hearing. So they can't hear the audio. They can see the visuals of the video. They can see the caption. They can see the content on screen, but they can't hear the content.

Audio description is primarily for users with visual disabilities. They can't see and the visual content of the video, but they can hear the audio. If there's visual content that-- content that's only presented visually, but is not presented via audio, if they can't see that, that content would be lost. So this typically takes the form of a narrator that describes that visual only content.

For entertainment media like DVDs, Blu-rays, this is very often called descriptive video service. I'm just going to play a little audio clip so you can experience this. There's nothing to see here. What you're going to do is experience content as if you were blind. You wouldn't be able to see it, but you can hear it.

[AUDIO PLAYBACK]

Now, in a black sky, a sliver of sunlight crashes the earth. Rays of light shoot off the continents and a three-dimensional word orbits the planet, universal. Words appear,
www.universalstudios.com.

[END PLAYBACK]

All right. So not all audio descriptions quite so dramatic, doesn't have quite so much fanfare. You can tell this is more of an entertainment type thing. But if you were blind, you can kind of-- I mean, we could kind of visualize that. That's important content that would be relevant. This is really important for some media if there is visual only content.

If you've seen the movie "Up"-- yeah, Pixar. I don't want to get those mixed up. You know, the first-- what is that, like seven, eight minutes of that video, it tells this entire story with very, very few words spoken. If you were blind experiencing that movie, if you're just listening to seven, eight minutes of silence, and you have no context, that-- those first seven or eight minutes set the context for the rest of the movie. The rest of the movie isn't even really all that good if you miss the context of that initial story that's told almost entirely visually. So a narrator in that case can provide that context.

If you think captions are expensive, audio description is more so. OK. Because it generally requires creating a new version of your media, a new audio track with narration that provides that visual only content. For the vast majority of multimedia content you want to avoid the need for audio description. You avoid the need for it simply by presenting any visual content audibly.

So if I were presenting, we are recording this, this shows up online, if I said something like, oh, as you can see, here is two important points, well, if somebody is experiencing that media and they can't see that content, it's now lost. That's one reason why when I present, I generally read the information or provide a summary of the information that's on the screen. It provides a more accessible experience, especially for users that may not be able to see that screen. So think about that in your media design.

Consider like a screen capture video. If you say, click here, then click here, then click here, inaccessible for someone that can't see it. If you say, click File, then click Edit, now, it doesn't matter if they can't see the visual. We need to think that way, think about that in our media design that the quantum is accessible via the visuals or the audio, but if they don't have both it still can be accessible.

So that's audio description. Now, WCAG 2.0 does require audio description at level AA. Now, we on a slide before, I recommended captions and transcripts. That provides the best end user experience. That's what I would recommend, and treat audio description as an enhancement. If it's important media and there's visual only content, consider audio descriptions. But WCAG does require audio description at level AA.

So as I just said, try to avoid the need for it in your media design. Questions about captions or transcripts, the requirements there?

Can you have something read a transcript so you got an audio description?

One more time. I want to make sure I understand the question.

You have the product and you have the captioning transcript, if someone can't read that, can't something read the transcript?

Oh, OK. So let's say-- all right. So you provide captions. You provide a transcript. Now, one thing about the transcript, the transcript should include in a visual only or audio only content. That is, I can get all of the content from reading the transcript without having to experience the media. So if there's like background laughter, music, explosions, things like that that are relevant

to the content, you would want to describe those in the transcript. Also, any visual only content. If I say, as you can see here, two points, if I'm reading the transcript and that's all I did, that content is lost so you'd want to put the visual only content in there. So yes.

So the question was if somebody can't read the captions or the transcript, could they have something read that transcript? That's part-- that is one benefit of audio description, is I can listen to the audio and get the visual stuff or that's another approach. Maybe I could use a screen reader to read the transcript and get all of the content that way. So yeah, that would be a possibility.

We've had screen reader users that have thanked us for providing transcripts, which is kind of interesting because we think, well, if a screen reader can hear the audio, if we have all of the audio content there or provide audio description, it's accessible to them that way, why would they want a transcript? Because we think a transcript generally more beneficial for a user that's deaf or hard of hearing. And the reason is that they could get the content of say a 10 minute video in three minutes by reading the transcript a lot faster. Good. Was there another hand here? Yes?

We were talking about audio descriptions that-- something about not having to click here and click here. What would be the problem with that?

Yeah. So say it's like a screen capture video, like you're demonstrating software. If you say, click here, click here, click here--

[INAUDIBLE]

Yeah, somebody that can see where you're clicking gets that content, but if I can't see the screen, I'm only hearing here, what is here? That's ambiguous. Yeah. Yes.

Jerry, just want to-- since you're an expert, I always ask experts their take on this. The differentiation in terms of priorities or levels of importance of public facing content, captions versus instructional content that may be locked in an LMS, authenticated so not public. In terms of priorities if you have limited resources, what's your advice there?

[INAUDIBLE] what we should do.

Yeah. Boy, I don't know. That's-- I don't know. That's a difficult one because some of the complaints and lawsuits that we're seeing are being based on the publicly accessible content. Those are things that are generally coming from external third party things, people that are doing these.

So those are-- they're kind of easier targets and it's a little more difficult because anybody out there could essentially file a complaint or a lawsuit, whereas, your internal stuff-- I mean, if you had students with disabilities that are accessing that, that's clearly, clearly covered. That's clearly-- would fall, I would think, into that category of discrimination.

With that said, you generally have a better sense of when those things are going to be necessary for students. You know, if somebody needs an accommodation they need to register with the Disability Student Office, Disability Services Office, whatever yours is called. So generally, have a little better sense of that. You would want to be ahead of that curve for those students.

I don't know. I know this is a really wishy-washy answer. I mean, it's all important. And we're seeing both on both sides, both the public and internal. So I'm not sure-- I don't know how-- it's a great question for you to probably tease out.

[INAUDIBLE] get overwhelmed when they hear about all this, and they go, there's no way I can do all that and so we try to say, take it in bite-sized chunks. You know, tackle your syllabus, tackle the-- and over time you'll have a much more accessible course, but try to maybe just not overwhelm them. Because then sometimes they're just paralyzed and they don't do anything.

Yeah, exactly. Yeah, especially with media. If you're dealing with-- especially of course content that is really media heavy, yeah, it can be difficult to take this on. So be step wise. At the same time, it's part of where having a good implementation plan is important. If you have a student that registers the day before the course starts and day one has media content and there is a student with an auditory disability in that class, are there mechanisms in place? How is that going to work? That's where it gets-- suddenly, what was initially seemed like a challenge is now a real distinct challenge, and you're putting your place in a-- putting yourselves in a place where there is potential liability there.

Yeah, that's a great question for you to probably continue to discuss internally, how you prioritize those kind of things. Good. Any other questions on ADM? OK. Real quickly, just want to highlight some of the other benefits of captions and transcripts. What are ways you've benefited from captions or transcripts, even if you're not deaf or hard of hearing? Yes?

[INAUDIBLE].

OK. Yeah, I was in the airport yesterday, and captions on the TV, I could get the content. Good.

You mentioned podcasts or something. They might be an hour long and you only have 15 minutes, you can scan through a lot quicker than you can listening to the whole thing.

Yeah. Very good. Excellent.

I feel like movies have very bad dynamic volume and [INAUDIBLE] there's a lot of explosions.

Yeah.

It's easier to just to turn the volume down and turn the captions on.

Good. Excellent.

Content that's in a different language or has accents that are difficult to understand.

Yeah. So content in other languages or accents. You know, watch BBC and very often, will turn on the captions. They say it's English, but sometimes I don't know. So that can be very helpful. So consider international students, multi-lingual students, things like that, where English may not be their primary language or professors where that might be the case. Having that content be captioned and transcribed is very helpful. Good. Others?

This is actually kind of disability focused, but like you mentioned earlier, the larger percentage of people with cognitive and learning disabilities, it can be extremely helpful when we work with this population. It's difficult to concentrate on what people are saying to make that be the auditory connection.

Good. Excellent. So the comment was about users with cognitive and learning disabilities, and we're talking about multimedia because it's multi-modal. There-- with multimedia, there's a visual component, there's an audio component. By adding that third modality of text with captions and a transcript, can provide some-- some people just learn better by seeing that text, by reading the text. Good. A lot of learning benefits there as well.

Other benefits of captions are transcripts? Yes?

Word searching.

Yeah.

A particular point in the transcript.

Yeah, so you can search. And not only end user searching, it's also indexable. Google creates a nice juicy content. In YouTube, there there's a really nice interface. You can pull up the transcript. You can search within the transcript. It'll actually synchronize the transcript and the video itself will highlight as you read. You can click on a word, it will jump the video to that point in time. Really nice interface for doing that. And within YouTube, the captions are searchable. So if you search for terms, it will search within human curated captions.

You can also search for captioned media within YouTube. So if you think of a really low hanging fruit, if you're creating course content and you can choose between two YouTube videos and one's captioned and one's not, you can favor the one that has captioning. Yeah. Good.

Other benefits?

You can save the content because I save a lot of transcripts, but I don't have the bandwidth to save all the video.

Yeah. Good. Yeah, so it's really accessible offline. Just get that content and save it. Excellent. Any others you can think of? Somebody mentioned the outer environments. Also, quiet environments. You know, you're in the library, you're in the back row. You guys could be watching YouTube right now, it would be fully accessible if captions were enables. Don't do that, but you could.

OK. So a lot of additional benefits beyond just accessibility, but by implementing accessibility you're providing a lot of additional benefit. Studies have consistently shown that engagement, retention, understanding to media is significantly higher when captions are enabled, and enabled by default. Learning is just better. People spend more time with that media when captions are enabled.

There are a lot of companies out there that are going to captions on approach. One I saw-- two actually I've seen fairly recently. One was EA, the game developer. They started doing-- actually collecting data on captioning and they found 60% of gamers had captioning enabled.

And there might be various reasons for that, but they had-- they said, wow, we need to put a lot more effort into our captions, make sure these are quality because the vast-- the majority of gamers have those enabled and might be because of low audio, it might be for a better gaming experience, it might be a language issue, it might be accessibility. They weren't sure. But they basically, are saying, we may start providing captioning on by default and have the option to turn it off because most people turn it on anyways. Yes?

The reason for that-- why I do it-- [INAUDIBLE] proximity voice. When you get closer to a character, they get louder. But [INAUDIBLE].

Yeah. So a lot of reasons. Kind of interesting, Yahoo is another one that's interesting. They're a media company. They caption and transcribe everything. They did thousands of hours a week of media content and they caption all of it. Some of the content is actually a broadcast content that was initially captioned.

They did the media without captions and they pay to re-caption it because they found that the time and engagement on that media is higher when there's the captions, and they make money off of time spent on media. That's where they make their money. And so for them the cost of captioning has been well outweighed by the financial benefits of the higher engagement and with their media, with it turned on. OK. Awesome. Good stuff. A lot of additional benefits there of good, accessible media.

Real quickly, just talk about users that are deaf and blind. So if you can't hear, you can't see, you can perceive content via text, via Braille. These refreshable Braille displays have mechanical pins that form Braille characters. You can read a line of Braille, hit a button, the pins will change, and you can read the next line or Braille.

So if somebody is deaf and blind, they can fully engage with your web content. Will be fully accessible to them so long as you provide that accessibility, don't implement barriers for them. That is-- this is one reason why we recommend transcripts, is that transcripts would provide the mechanism for users that are deaf and blind to get the multimedia content. They can't see the captions. They can't hear the audio or audio descriptions. They can read through a transcript via Braille.

All right. That's it for auditory disabilities. We want to move on and talk about low vision. So this is users generally that have vision that can't be adequately corrected with glasses or contacts. So it might be fuzzy content. A lot of different types of low vision.

So it might be just low visual acuity, might be fuzziness. It might be maybe like tunnel vision where you normally see a small visual field of view. It might be where you can only really see in your peripheral vision and your primary vision is obscured. It might be tremors where things move or shake. It might be color blindness or color perception. A lot of different types of visual disabilities where users can be impacted.

One of the more common things that we see though is users that need larger content. So this is that same page from Amazon. We conducted a survey of users with low vision. We found about a third of respondents did not enlarge web content at all. Maybe they had a visual disability where they didn't need larger content. Maybe they needed just higher contrast or user defined colors. Or maybe they had tunnel vision.

If you have tunnel vision and you make things larger, you've created a worse experience. Some users with tunnel vision may actually make content smaller so they can see more of it within their small field of view. About a third of respondents increased content to 200-- around 200%. Pretty large when you see 200%. About a third of respondents magnified content to 400% or larger. Very large.

As you enlarge content to this level, there are few things that start to come into play. One is the use of text within graphics. The text in a Kindle Fire seven-inch tablet, that's true text. You can see it's maintained to it's crispness. It's nice and readable as it's enlarged.

To the left, the text there, Kindle Fire now in HD, ironically is not in HD. That content is text within a graphic. It's becoming large. It's a little more fuzzy, a little more difficult to read. So it would be a consideration. It's just the use of text within images. If the text is in an image as it enlarges, it very often will become more difficult to read.

The way WCAG addresses this, it says, if you can get the same visual presentation by using text as opposed to text in an image, you should use true text, which makes sense. Why would you put text in an image if you can make it look exactly the same way by using true text? So that's the approach there. And there are a lot of other benefits to this bandwidth. Searchability, you can copy and paste. It's more flexible. It's adaptable. The text will wrap, say, on a phone. Anyway, a lot of good reasons to do this, accessibility being one of those. All right.

Going to jump real quick-- why don't we stop. This is a good place to take a break. Just a couple of minutes early here. When we come back, we'll talk about sufficient contrast. So we're going to do 15 minutes for a break. OK.