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NORTHWEST UNIVERSAL DESIGN COUNCIL
CITY OF SEATTLE

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>> Good afternoon, everyone. I want to welcome you and thank you for coming today to our presentation "Are Your Digital Communications Accessible" by the University of Washington technology accessibility specialist Terrill Thompson. I'm with the Universal Design Council, and I want to thank you all for being here today. Typically, you think of Universal Design or most people think of Universal Design as dealing with the built environment, frequently in terms of our residential experience. But Universal Design is really a set of seven principles to which everything can be applied. Equitability of use, flexibility, simple and intuitive use, perception of information or perceptible information, a tolerance for error, low physical effort, and space and size for approach and use.

Those are and certainly -- number 6 is low physical effort and size and space for approach.

These are the principles that can and are also used in our digital communications. And that's when we're going to talk about today. Before we get started, I want to thank some of the people that were involved today. The City of Seattle specifically. City clerk Monica Martinez Simmons, the legislative department and finance administration services for this venue. The human services department and aging and disability services for staffing the Universal Design Council and coordinating today's event. In particular, Irene Stewart who is our -- we'd die without. I'd also like to thank Doug Hiltie who is with us today who is also on the steering committee for the Northwest Universal Design Council and our communications with Doug is where a lot of this issue came up. And he was very instrumental in getting this done today. So thank you, Doug.

I'd also like to thank those who gave us promotional and emotional and physical support.

Specifically A11YSEA, spelled A11YSEA, which is the Seattle Area Universal Design Inclusive Design meetup group. The Seattle Commission for People with Disabilities. Seattle Department of Neighborhoods. Seattle IT including the Seattle Channel and community technology literacy and access programs. And Seattle Channel is recording this today.

Seattle Public Library LEAP program which stands for the Brier equal access program and the aging community based coalition of aging network organizations.

Most of all, I'd like to thank Terrill for being here today and sharing this topic with us.

Terrill works for the University of Washington as information technology accessibility specialist throughout the University of Washington as well as the world. He collaborates with a wide variety of stakeholders. Terrill has over 20 years of experience in the IT accessibility field. He has presented at numerous conferences and consulted widely with government, private industry, educational entities on IT accessibility issues.

So, without further delay, I'd like you to help me welcome Terrill Thompson.

(Applause.)

>> TERRILL THOMPSON: Thank you. It's great to see such a large crowd on a Thursday afternoon. And you know what you're going to get talking about accessibility and Universal Design. Sometimes it's just a handful of people. And even those can be very rich conversations and I really get thrilled when there are a lot of people interested in the topic and willing to engage. Ideally every presentation would be to a crowd like this. So thank you. Appreciate you coming out today. I am with the University of Washington and I've already gotten a couple questions about how accessibility works at the University of Washington. So I thought I'd share a little bit about my role within the university. I'm not in disability services which, provides students disability resources for students, provides services to students with disabilities. And there's the distant services office which provides services to employees with disabilities. And I'm not with them either. I'm actually kind of uniquely positioned as an accessibility person within IT.

So that's kind of unusual you will though it's happening more and more across college campuses all over the country in that information technology, Web sites, videos, computer labs, all the things that we do with information technology,

software -- there are accessibility issues with that and it makes sense that the people that need to address those accessibility issues reside within an information technology climate. So the people that are responsible for deploying those technologies are responsible for ensuring that they're accessible. So that's the philosophy at the U-Dub and it has been for a long time. Since the early '90s maybe even before that, accessibility, accessible technology was positioned within the information technology group. Central computing group.

And so that's my department is accessibility technology services. So it's a small group that resides within UW-IT and we work collaboratively with people all over campus to ensure that the technologies that we're using are fully accessible. So that's my role at the university.

I've got three logos up on the title slide here. The first is the W. The University of Washington logo. And then over on the opposite side is do-it. How many of you have heard of Do-It? Half the hands go up or slightly fewer than that. But that stands for disabilities, opportunities, Internet working and technology. It's an organization that was originally funded back in 1993 by the National Science Foundation. And still receives grants from the National Science Foundation and lots of other sources. But it is a group within UWIT that partners with the college of science -- college of computer science and engineering and originally with the college of education and it's a collaborative effort to empower kids with disabilities starting from high school who are interested in college or interested in challenging careers getting them to come to the university for a summer immersion program. And then we have a number of grants that we've gotten over the years that sort of piggyback off that effort and work to break down barriers for these kids. So they come and they get sort of the college experience and they learn what it's going to be like going to university, what sort of accommodations they might receive. How to self-advocate, how colleges is going to be different from high school. And all sorts of things related to transitioning from high school into college, transitioning into employment.

So we work with the kids, we work with schools, we work with colleges and universities, we work with employers just to try to carve-out a path so that they can succeed at whatever it is that they want to succeed at. That's what do it does. And the third logo up there is access computing. And that is one of the grant funded projects that do-it works on in collaboration with the computer science department focusing on branding people with disabilities in computing careers. That's a major focus and major funder of my position. And so that's why the logo is up there to pay homage to the funding source that makes my being here in part possible.

I'm also up here -- contact information. That's important if you want to reach out to me afterwards, I'm happy to have conversations about accessibility with anybody.

TFT are my initials. Tango fox trot tango.

@uw.edu.

Tft@uw.edu. Also on Twitter if anybody does that, Terrillthompson on Twitter. So we're here to explore digital communication. And I wanted to start with a slide that I consider really pretty stellar, pretty beautiful. If I can do my best to pass an

alt text to this, it's a brilliant golden sphere with touches of other colors mixed in but all of these points within the sphere are interconnected. So they're dots and they're lines that connect those dots and they're all interconnected. Some are big and some are small and it creates this huge brilliant thing. Anybody know what this is?

>> AUDIENCE COMMENT: It's a representation of the GitHub repository.

>> TERRILL THOMPSON: Very good guess and very close. But very tiny. That actually comprises one of those dots. There's much more.

>> AUDIENCE COMMENT: It's a demonstration of poor contrast in a badly lit room.

[Laughter]

>> TERRILL THOMPSON: This is the room's role in this. And I can't say no, it doesn't have poor contrast because it does in this context. But, if you look at it in a darker room, it actually has very good contrast.

This is the Internet. This is actually a map of the Internet that a person whose name escapes me but the project is called the Opte project. You can find out about it at opte.org. O-p-t-e.org.

And this was the vision of a person who had severe dyslexia but is a very visual person and he sort of tells a story on the opte.org Web site. But he set out to map the Internet and this is the outcome of that project. This is an actual representation of all the nodes on the Internet and how they all connect. When he started to do this, he came to realize how incredible this is at communicating the vastness of the Internet and really, it's kind of a beautiful thing. We don't necessarily think of the Internet as a beautiful thing. But when you step back and look at it in this context, it really is quite stunning and quite a work of art.

I've got some numbers here to also communicate the vastness of the Internet and all of those Internet governance networkings and the communications that's happening.

This is a somewhat old slide that I used in another presentation so it's quite possible that these numbers are grown significantly since I put this slide together. You can get live data at Internetlivestats.com and it's constantly ticking away like a stock ticker. But you'll find there are nearly 3 billion and probably by now 3 billion Internet users. Nearly one billion Web sites and maybe more than that by now. Over 96 billion emails sent today alone.

Nearly 2 billion Google searches today. Over 3 billion videos viewed today on YouTube. And over 1.2 billion active Facebook users.

So those are huge numbers. And it makes me appreciate how interconnected we are. In some cases for better or worse but, if we focus on the positive. There's a lot of great collaboration, communication, unprecedented connection with people all over the world. We've never had quite like we have today.

So again, I find this a very beautiful thing.

And if you think about those numbers, all those billions of people collaborating and connecting and working together and accessing the Internet, doing different things on the Internet and functioning society in different ways, do you think of a typical computer user where here we have a slide that has a silhouette of a person

seems to be male who has no hair in this silhouette, sitting at a desktop computer with a desktop monitor using a mouse. How many of you relate to this person and how many of you feel like that's me up there even a typical computer user just like that person. Not many hands go up. Seven or eight hands go up. And so my point in sharing that is that if you think about all those billions of users out there, there are a few that do resemble that person. But there are a lot of people that don't resemble that person. Really, there is no typical computer user.

The typical computer user, kind of the standard model for interacting with computer, is you've got a monitor that you use to access outputs. You've got a keyboard that you use for inputs and that came first and then a little bit later the mouse. So you might also have a mouse for input. The traditional model. But that's pretty old-fashioned by today's standards. A lot of people -- we see this everywhere, particularly on a college campus, everybody is walking around with their mobile device accessing whatever they're accessing, communicating with people and doing all sorts of things with their mobile device. This happens to be an iPhone that's pictured here. But even with our phones we have a wide variety. We've got Androids, we've got Windows mobile devices. And the experience on each of these devices is going to be different.

So depending which device the user has they are going to be perceiving things very differently than the person next to them. Some people have tablets there, too, you have a lot of flavors, lots of shapes and sizes and that impacts the experience that person is having. You've got some people who are not using a monitor so they're not visually looking at content and even on the phone they might not be visually looking at content. I navigated here using Siri. So she walked me through where I needed to go to get to city hall. I was using an audible interface. People who can't see have for a long time -- when we've thought of audible interfaces we thought of people using screen readers and listening to content audibly. But now it's much more broad than that. There are lots of people who need for various reasons to be interacting hands free with information technology so listening to content is more and more common among everybody.

Yet people who use speech recognition -- so you know, voice input as opposed to using the keyboard or using a mouse. And here again, that traditionally has been the realm of individuals with disabilities who maybe couldn't use the keyboard or the mouse or couldn't use them efficiently. And so voice became a viable means for them to interact with technology. Now you've got a lot more people using voice. Again Siri came to mind that I can prompt Siri with a voice command and she then responds with whatever information I'm using at the time. More and more people are interacting using voice. We also people interacting using touch. So rather than listening to content audibly, they might be feeling content through a refreshable Braille display. This goes both ways. They might be using Braille for input and Braille for output. I had to stop because I ran out of room on the slide. But I can go on and on and on sharing different examples of how people interact with technology and access the Internet and access email and all that.

And it's incredibly rich and incredibly diverse. Just a couple weeks ago I was in San Diego at the CSUN conference on conference and disability. Huge conference with -- or used to be I think hundreds -- it's a little smaller now, but lots

and lots of vendors who are exhibiting assistive technologies and there's just so much assistive technology that's out there. That really anybody who can twitch a muscle can use a computer. There are assistive technologies to provide access and that just helps to sort of communicate that it's so rich and so diverse. The different ways that people are accessing technology and communicating. Even those of us that access content visually using a monitor have a wide range of differences. So here's a screen shot that shows these screen resolutions from my Mac Book Pro anywhere from 640 by 480 to 1680 X 1050. So different sizes and all points in between. Stretched, not stretched. There are different choices I have to configure my computer so it looks how I need to to look and has a display that is adequate for the font size and icon size and so forth that I need.

And within browsers, I've got a lot of flexibility, too. This is a screen shot from Firefox where the default font size is 16 pixels. I can change that from 9, if I want really tiny fonts, which some people for some reason like, on up to 72. Pixels.

So you've got a lot of variation and it's very easy just to go into preferences and change the font size within your browser.

So what this all means is that there's so much variety and as people are creating content and creating applications and web pages and so forth, they need to understand that what they see right now as their building something is completely different probably from what a lot of people are going to see or are going to experience. So people are all going to experience their communication differently than what they might be envisions. So there's got to be flexibility there and some understanding. People all fall somewhere on this continuum between able and not able depending on what function you happen to be talking about.

So I'd like to argue that the notion of disability/not disability is a little bit of an artificial notion. And I realize there are reasons why people can claim to have disability and there are laws associated with that and benefits that are associated with that. But when it comes right down to it, it just depends on what we're talking about. If we're talking about the ability to see, then how many of you have 20/20 vision? There are three or four people in the crowd. There always are a few that have 20/20 vision. A few people here are not able to see at all. And most of us fall somewhere in between.

And you know, if we were to plot that out, it would be a very broad spectrum, I bet. And on the ability to see scale.

If we look at ability to hear, again, you're going to have a very broad spread. The ability to walk, the ability to read print, the ability to write with pen or pencil, the ability to communicate verbally, to tune out distraction, on and on and on we could go. And the continuum is going to be full of dots. So, if we were to plot that there would be a central cluster in the middle that is thicker than the others but there are going to be outliers that are very good at whatever this function happens to be and there are going to be some that are not so good. But those who are not so good are going to be better on other dimensions. So it depends on what you're looking at. So the point is there's a ton of diversity, everybody's different. Everybody's good at some things, not so good at some things. And this whole notion of disability is -- is a binary thing that yes, you either have it or you don't is really an artificial construct.

So a lot of people use assistive technologies to accommodate their disability and help them to perform things they couldn't do otherwise. So headphones for example represent here listening to content. So, if you can't see the screen, then you can listen to it. That's an assistive technology. A screen reader as an assistive technology that makes that possible. Refreshable Braille device. Makes that communication possible.

Speech recognition, the ability to control a computer and to provide input to a computer with voice alone makes that possible for somebody that's not able to use a keyboard or use a mouse. A calculator is assistive technology for somebody who is not able to perform complex mathematical calculations in their head. Most people can't do it so we have assistive technology that helps us perform that function.

Eyeglasses, a lot of people have eyeglasses in the room. I've got contact lenses. And it's an assistive technology that helps with vision. Corrects vision to make people see a little better than they can otherwise. And of course wheelchairs being able to get around if somebody is not physically able to get around. Let's say we've got that assistive technology. We're in need of a wheelchair and we are sitting at the bottom of this government building which has two or three dozen steps to get up into the entryway.

How are we going to get inside this building? It's a government building. So we need to get in there to participate in the democratic process. How do we get in? Any ideas?

>> AUDIENCE COMMENT: We pass a bill. We pass a bill. 1977 we passed it here in the handicapped Congress to have access to federal buildings.

>> TERRILL THOMPSON: That's one thing. It's going to be a long process. You're at the bottom of the stairway and you want to get in so you pass a bill and you advocate. Talk to your government leaders.

[Laughter]

and eventually, you have a law and eventually that translates into access. But meanwhile, you need to get in there.

>> AUDIENCE COMMENT: Ramp.

>> TERRILL THOMPSON: You need to get in from. So ramp would be a solution. What else? Elevator would be a solution.

>> Take the stairs away.

>> TERRILL THOMPSON: So what do those things have in common? What does a ramp and elevator have in common? As opposed to you -- the other alternative would be you getting a wheelchair, the wheelchair on the slide here if you look closely at it is a rocket powered wheelchair that goes from something like zero to 100 in five seconds. There actually is a Web site with search for jet powered wheelchair, this is kind of crazy product that's on an assistive technology Web site. This has a ridiculous price tag but kind of a fun thing. But even if you had that wheelchair, that might be where you as an individual, you could get up these stairs without a wheelchair. But most people don't have that wheelchair. So, instead, a ramp, an elevator, that's a change to this built environment, right? So one scenario is you taking this on and you know addressing the challenge yourself by getting a better wheelchair. It other is the building needs to be adapted

to so it is more universally designed to people can get inside. What we want to do we're here to talk about technology and digital communications. But this same metaphor applies that we need to not just expect the user to get assistive technology. Well, you can't access this and get a screen reader or get a better screen reader. But the technologies that we are providing and the communications that we're providing via technology like Web sites and documents, need to be created in a way that has Universal Design built in.

So you know, the ramps and the elevators. Our documents need to have those things so that people can read them.

So we're going to talk about the nuts and bolts of that so you'll understand what that means exactly. How do I build an elevator in my document that I'm creating or on my web page? So we're going to look at three examples and sort of dissect those into some depth. Types of questions that we want to ask as we're looking at inaccessible technology and digital communications are things like can I access it without sound. Is it critical I need to be able to hear this and if I can't hear this, then how can it be adapted so that I can access it? So in this case captions would be a solution. You've got captions on videos, then yes, I can access those without sound.

We've got a transcript. So in some cases captions aren't enough. Somebody's got a really low Internet bandwidth, then they are not going to be able to play the video, therefore, they're not going to be able to see the captions that are synchronized with the video so having a transcript would give them access to the content. Can I access it without a mouse? So here's a screen shot of a webinar environment where there's a lot of stuff going on. There's a appropriate interface, list of attendees, there's potentially a video with the speaker's face talking. If it's a good accessible environment, then there would be live captioning as well.

Got a few links and resources in the lower portion of the screen. Difficulty accessing this tool. Could be challenging to a lot of people. As the title suggests "Can I access it without a mouse?" A lot of functions here one would typically click in order to access them. So where do I ask a question of the speaker there's a place at the bottom of the second panel where there's some sort of prompt to enter the question here. So a mouse user and eyesight would click in that spot and be able to type. But, if a person can't use a mouse, can they tap to that spot? And can they type their question then? Is it clear whether they get there where they are and are they able to fully function without using a mouse? There are actually stickers on the red table as you came in, feel free to grab some of those as you go out." No mouse" stickers. What you see on the slide here is the same thing on these stickers. I encourage you to promote this. But take the "no mouse" challenge. Hashtag#no mouse. On social networks, Twitter, Facebook, anywhere you can use a hashtag, use the no mouse hashtag and visit nomouse.org to find out what this is all about.

The short version is just try using any web page without using a mouse. Resist the urge to touch your mouse if you're a mouse user and maybe even go beyond that and spend an entire day without touching your mouse. And particularly if you spend an entire day in front of the computer.

You know? All the Web sites, all the software, everything that you normally

would do by clicking on things and dragging and you know, moving your mouse around, don't use your mouse at all and just see what that experience is like.

This is just one accessibility issue among many when we're talking about Web sites. But it's often a really good indicator of whether a Web site is accessible or not. So, if you can't use it without a mouse, if there are just functions there like drop-down menus or other controls, you have buttons on a media player, things that you have to have a mouse in order to access, chances are this Web site has a lot of accessibility problems. If maybe it's even keyboard accessible. But you can't figure out where you are. It just -- there's no visible focus that sort of attacking where you are as you tab through the page.

Then that's going to be really not usable for somebody without a mouse. So take the no mouse challenge and then you know, use the no mouse hashtag to share your experience around the world and encourage others to take the no mouse challenge, people who have responsibility with Web sites, ask them have you tried this without a mouse? If not, try it and see what the experience is like. It can be very enlightening.

Can I access it without seeing it? So those of you that can see, we have a document up here on the screen. This is an introduction to physics course syllabus. So it has all the things you need to know about the physics course you're about to take. And including the course objectives and all of the assigned reading and how the -- grades are broken down, what percentage of your grade is this versus that versus the other.

So let's ask just a couple basic questions like how many course objectives are there? Nobody is shouting out the answer. A lot of people shaking their heads and a lot of people seem frustrated. Some think this is a silly exercise. But, if I was your physics professor, you wouldn't be laughing. Maybe you would. Very hard to -- that information is here. It's hard to see with this poor contrast in the room. But even if you could read this, it's hard to extract that information, right? Why is it hard to extract that information?

>> AUDIENCE COMMENT: No format.

>> Tiny font.

>> AUDIENCE COMMENT: It's physics.

[Laughter]

>> AUDIENCE COMMENT: No hierarchy.

>> TERRILL THOMPSON: There's no hierarchy. No structure.

>> AUDIENCE COMMENT: And oh, by the way, it's small.

>> TERRILL THOMPSON: It's small. Lots of things wrong with this but the one thing I want to emphasize is there's no structure. It's just a big blob of text. If we visually format this and add structure to it, this is what it looks like. It's still pretty small but I can describe it. There's a banner across the top that says accessible university. That's the name of this fictitious university. There's a maybe heading big bold centered text that says introduction to physics course syllabus. There are four subheadings that are also big and bold that they're left justified instead of centers so that's now I know they're different than main heading. One is textbook, one is course objectives, one is class schedule and one is grades.

Underneath each of those headings you've got content. Under textbook heading there's a paragraph. Underneath course objectives there are three list items, each with a bullet in front of it. And so I ask how many objectives there are. If you look at this visually, then that's an easy question.

Because there are three bullets underneath the course objectives heading.

So all of that becomes very easy to access because there's structure.

So the problem that we encounter a lot in the digital accessibility realm is that that structure is a thick structure. It's a visual only structure that looks structured. Those headings look like headings but maybe they're just big and bold and centered text. Not really headings. They're just like this, just a big blob of text. And some of that text is pretending to be something that really isn't. Under the hood it's just plain text with no structure. So what I'm getting at is that when you have a heading whether it's web page or Word document or pdf, it needs to be tagged as a heading. There are ways to do that in all of those tools. So, if you need to mark up headings as heading 1 if it's the main heading, heading 2 if it's a subheading, if you have a list of items, then you need to use the list tool that's billed into your word processing platform or on a web page you need to use the proper markup so that a list actually is a list, all of this information if communicated to assistive technology users, and particularly we're talking about people that can't see the page, so a screen reader will announce headings and provide function that's enable you to jump from heading to heading and heading to explore the organization of the page very easily, very quickly. But they have to be headings in order for that to work and they have to be listed and tables and so forth. So without that kind of structure and proper accessible markup, then you end up with a big blob of text that really is meaningless and very, very difficult to understand.

So we get into a bit further detail as we plunge further into this problem.

So the question that I want to explore kind of throughout the day is who's responsible for this? And also is it a good way for me to get to know the audience a little bit. But there are five groups. And I can think of a couple other groups that fit into this too. The five main groups that are responsible for ensuring that the communication is accessible. One of those is the assistive technologies themselves. So they certainly play a role because that's the tool that a lot of users are going to be using.

The center of this we have accessible -- accessibility standards. So there has to be a central way that says this is how you need to tag a web page in order to ensure that it's accessible. And this is how you need to tag a document so that it's successful. And those standards do exist. We'll talk about those in a moment. So that's kind of the heart of things. So that's what makes communication happen. But then we have assistive technologies that need to support those standards. We have software and operating systems that need to support those standards. We have web developers and content authors, anybody who is producing a document or producing a web page needs to also support those standards. So, if you design a web page or create a document that complies with standards, then assistive technologies support standards, software that supports standards. They all do the right thing and deliver that in a way that works for their users. All of these parties need to be on board with the standards. Web authoring and development tools

need to make it easier for you as an author or content developer, there are millions, billions of authors. And so it's pretty daunting to think that they all need to understand accessibility standards and probably is never going to happen. But, if the web authoring development tools automatically create accessible content, then that relieves authors. So how many of you identify with assistive technologies? How many of you are assistive technology developers? This are a few users whose hands went down. If I asked that question at CSUN a couple weeks ago a lot of hands would have gone up. How about software system developers. Anybody here from Microsoft? One hand goes up.

And because there's only one do you mind if I pick on you? Where are you from.

>> Starbucks.

>> TERRILL THOMPSON: Okay.

>> AUDIENCE COMMENT: Myself and the teams that I support build our Web sites Starbucks.com and our mobile applications for iOS and Android.

>> TERRILL THOMPSON: Okay. So he represents a team that builds Web sites and mobile apps on behalf of Starbucks. So then you also identify with the web authoring or the web developer and content author piece. How many of you are web developers -- let's start with web developers. How many of you develop Web sites? About 10,15 hands go up or so. How many of you author any sort of digital content. Create documents or compose emails? Most hands go up. How many of you are involved in accessibility standards groups? Quite a few hands go up there. So that's great. About 10 hands or slightly fewer went up for that.

Looks like it's some examples. Let's start with web pages.

How many of you are going to venture into HTML and tags just a little bit? Not enough to be painful. But how many of you are afraid when I start talking about HTML tags? A few hands go up. How many of you are okay if I talk about tags a little bit? A few hands. I couldn't change my talk really. So --

[Laughter]

So HTML, the language -- this is hypertext markup language. The language that makes the web what it is. This is the language behinds the web. It's been around since 1993. This is when it was invented by Tim Berners Lee the person we see on the screen up there.

And the -- and one of the very early drafts of HTML, this is 1.2. There was a 1.1 that I don't know if that still exists. But 1.2 is still out there and it's really Tim Burners Lee scribbling ideas down. There are a lot of typos, it's odd as a technology standard to see this. But he included in HTML heading tags. H1 through H6 which are designed to form an outline so you've got H1 being the main heading on the page. H2 being subheadings and if you need them, then you go further down. So H3s, H4s. They form an outline of the heading structure of the page.

And he said even in the very early draft of HTML, he said it is not normal practice to jump from one header to a header level one blow for example to follow an H1 with an H3. Although this is legal, it is discouraged because it may produce strange results when generating other representations from the HTML. This is a

key issue when we talk about web accessibility that those headings need to form an outline. So a user or screen reader user can jump from heading to heading and get a good understanding of the relationships between all the parts and can't understand the outline of the structure of the page. So this was built in from the beginning. This is part of HTML standard from the beginning. So accessibility has always been there.

Also, in HTML 1.2, there was an image tag which allows you to add pictures and photos and artwork, visual artwork to web pages. But even in that early -- when image was introduced, alt was also introduced. So you could add alternate text to an image so that somebody who can't see it gets a short description of that image. So that has been there since the beginning.

Tim Berners Lee after he created the Web also founded the World Wide Web consortium. That was an organization of people representing a lot of different sectors in society. Who had an interest in the web and who then became kind of the standards body. So they are responsible for maintaining the HTML specification and other standards, specifications that apply to the web.

So HTML is there, cascading style sheets which is a markup language that's used for decorating content and controlling how it's presented. And they also recognized very early on that the web had a lot of potential to break down barriers for people who otherwise had been struggling with inaccessible print content for trying to get alternative versions of things. But now they can access all sorts of information and had the potential to break down barriers but also had the potential to introduce new barriers. So very early on in the history of the W3C, they created a web accessibility initiative. So it was a group of people that got together to specifically look at this program of web accessibility. And they came out with the web content accessibility guidelines, sometimes called WCAG. W-c-a-g, Wich-Kag. Version one came out in the late 1990s, so it's been around a long long time specifically telling us how to create accessible web pages and version 2.0 is the more contemporary version of that set of guidelines and then there's another new specification called Aria. Stands for accessible rich Internet applications. And that is a specification that allows very complex rich dynamic web applications to be accessible to people with disabilities. Particularly people are using assistive technologies they can understand what's going on on the page when things are changing and moving in response to user behavior because ARIA communicates that to their assistive technologies. These are just some examples of how W3C has integrated accessibility into their standards.

Bit more information about the WCAG in particular, it became an official W3C recommendation or official standard in 2008. It has four broad principles. And that is that content needs to be perceivable regardless of how you might perceive it. Maybe visually, maybe audibly, maybe through tactile interface, you need to be able to perceive the content. It needs to be operable. You need to be able to operate the links, the buttons, the sliders, any of the controls that you might use a mouse for, you need to also be able to operate with just the keyboard or speech or whatever your input modality might happen to be. It needs to be understandable so we shouldn't have to be rocket scientists to figure out what's going on on this web page and how do I interact with it.

And it needs to be robust which means that as the Web involves and delivering content then our web pages should still work on those new devices, we don't want to have to go back and redesign the web redo all our pages because we have new devices. You know, they need to be robust and they need to be able to transform themselves regardless of what sort of tools people are using. Within these principles there's a checklist so a list of things you need to do in order to be accessible. There's 62 of those so that's where you get into the detail. And each of those is assigned a level. So there are level A, level 2A and level 3A. And those are kind of my priorities. So level A are the highest priority, those things that if you don't do them, you're going to exclude some group of people that just -- they're not going to be able to access your web page. Level 2A is the next level, things that maybe a little bit harder maybe a little bit less critical but still are pretty easy and pretty critical.

So kind of level A and level 2A is really where the line has been drawn that as we see in legal cases, policies, surrounding web accessibility, they tend to result in a person agreeing to comply with WCAG2.0 at level 2A. And so that I think is pretty widely established now that that's the bar. That's what we need to be shooting for.

So what does that mean exactly?

Well, it means that we need to alt alt text to our images -- add alt text. We need to add captions to video, we need to not use color as the only means of communicating information. So something like required fields are in red often a form field. That's not going to work for somebody that can't tell if a text is red. Proper heading structure that we talked about having those H1, and H2s, having labels on form fields. So, if you've got a form and you've got prompts, visual prompts that say enter your first name here, enter your email here, those need to be tagged in such a way that the label enter your email here is actually connected to the form field. Behind the scenes the code unites those two pieces of information. So a person using a screen reader is now through the form and they hear these prompts. Otherwise screen readers have to guess which prompt goes with each field and sometimes screen readers either don't guess -- most screen readers don't guess. JAWS guesses and sometimes JAWS gets it wrong. So we don't want JAWS to guess, we want to code the web page so JAWS doesn't have to guess. Also visualization of keyboard focus. As you take the no mouse challenge, move around without using a mouse, you should know where you are. That is an easy thing to do with the markup that's available to us. So in addition to the W3C standards we also have section 508 standards. These are from the federal government from the Access Board. And they accompany the section 508 law which was submitted -- this is section 508 of the Rehabilitation Act amended in 1998. And it requires accessibility of electronic, and information technology developed, procured, maintained or used by federal agencies. The standards -- that was a 1998 law. The standards were then written by the Access Board, the federal agency. And they were published in 2000.

And they cover a broad cross section of information technology. So web pages is one of those but also software, hardware, media, telecommunication and stand alone devices which is information kiosks.

That was 2000. So it's been a long time and it's kind of -- those standards are sort of showing their age. But they are working on a refresh that the latest draft of that adopts the web content accessibility guidelines at level 2A as the section 508 requirement.

And even though WCAG is web specific, it actually is written in a way that really applies to a much more broad principles apply to a much more broad set of information technologies, not just Web sites.

W3CARIA specification, as I mentioned it helps to make dynamic rich interfaces accessible. And so there's an example down at the bottom of the screen where let's say you're filling out a form on a web page and you do something wrong. You enter an invalid email and then a message pops up on the web page somewhere on the top of the page that's nice and visible and easy to spot that says the email you entered is not valid. Please try again. If you're filling this out as someone who can't see, you're just using a screen reader, how would you know this error popped up. This used to be a big problem that things would happen in response to something you did but they would happen somewhere else on the screen and the user doesn't have access to that.

So with this simple markup using ARIA you could add role equals alert to this error message container. And that function that that serves is it tells screen readers to announce this right now. So, if a user experiences this, then the screen reader interrupts them at this point because this is very important that they know that the email they just entered is invalid. So it interrupts them with this information. And they don't lose their focus, they stay where they are on the page but they now have this new information they just heard and they can respond accordingly. Very simple again role equals alert provides all that. That's the kind of thing that ARIA does. It adds tags to web pages that make complex things that are going on on the page understandable to assistive technology users.

And there are some low hanging fruit. So, if you're a web designer developer, then adding ARIA landmark roles is a very, very easy thing that you can do today that doesn't break anything, doesn't even require any further testing. Because it just works for screen readers and doesn't have any effect for anybody else. But that is things like for the main content of the page. Add role equals main, that communicates that this is the main content of the page. If you've got a menu, add role equals navigation and that communicates that this is the navigation region. This is the menu. So users then can easily jump to those areas of the page and understand what the functionality of that area of the page is. So it really makes a big difference and helping you just understand how the page is organized and structured and very, very simple markup.

>> AUDIENCE COMMENT: As a consumer and a person whose professional role at the city involves a lot of community engagement process --

>> TERRILL THOMPSON: Here comes a microphone.

>> AUDIENCE COMMENT: Thank you. I have a lot of concern because I see us moving to what I see as the sort of video game visualization of our communication. It isn't suitable for a mobile app, then we kind of don't like it as much. It's not as cool. It doesn't explode pictures. It's very graphic oriented and I've been expressing for a while now that isn't going to be very accessible to a

broader audience. Not to mention just size of screen issues, that kind of thing. So when we're trying to navigate between what keeps up with our lack of better term younger, more digitally focused constituency, how do we retain value for those who have different abilities in the first place regardless of age. And frankly, those who aren't digitally connected but could still use the benefit of these assistive technologies? In 20 words or less?

[Laughter]

>> TERRILL THOMPSON: Two words. Keep fighting. It goes back to your answer earlier at the bottom of the steps. Pass a bill. Although just advocating and getting young people because a lot of this is directed at young people. They're trying to reach young people. I've got a son who is 18 and a daughter who is 16 and as I watch their response to pages like that, they don't like them. They just want the information. They don't want a lot of bells and whistles. I don't know how typical they are, but it seems I hear this from a lot of people that I think there are some marketing people or somebody wants things that move. We actually heard this at the University of Washington from high level administration people that it needs to move.

And so our response is why does it need to move? You know? What evidence do you have that moving is going to attract more people as opposed to turning more people off? So that's -- if you feel that way, that moving parts doesn't necessarily make a Web site better, do whatever you can to sort of help spread the word that maybe that's not a better thing. Ultimately maybe data will help. If you can collect information that says people really don't respond well to this, then that will help too for people making those decisions, it's important to separate that aesthetic piece from the accessibility piece because it's kind of a myth that accessibility is plain and ugly and so we do finally have to dispel that myth that a lot of accessibility does not affect the visual look at all. We just need to add the markup that's necessary to communicate what all the parts are and then it becomes more accessibility to see it and so forth. But yeah, that's a good point. Question near the back and here comes a microphone for you.

>> AUDIENCE COMMENT: To follow up on the lady's question in front of me over here to my left, what do we say though -- I mean, obviously, there might be ways to sort of, as you say, finalizing. But I want to know more about the technology that's available to make that -- those -- some of those moving things and pictures, are they just inherently inaccessible? Those moving picturey things, all of them? I know I should know this, I mean how can I put this? I think I know the answer but I just want you to talk a little bit about that if you would, just talk about those moving graphical things.

>> TERRILL THOMPSON: So ARIA actually, if I go back a slide, I kind of intentionally skipped over this because didn't want folks who aren't web developers to gloss over. But ARIA's role is to answer questions like what is this? How do I use it? What's its current state? Is it on or off? Expanded, collapsed, et~cetera. What just happened if something happened. A good example is a carousel as we call them. It's like a slideshow. So you've got multiple moving parts. You see this on a lot of home pages now. Moving parts with maybe a few controls that

allow you to advance or go back. And most of these are very inaccessible in that there's no communication of the structure so a person who can't see can't -- does know there are five slides in this set. Or a person who can't use a mouse can't advance to the next slide or go back all of those are solvable problems with ARIA. And with also adding maybe some keyboard functionality using JavaScript. But there are other issues too. And ARIA doesn't solve all the problems. If you've got something constantly moving on a home page or on any home page that's going to be a problem for somebody who's easily distracted or has difficulty focusing. They're trying to read something else on the page and this content changes and draws their attention back to that content and away from whatever they're trying to read. That can be very problematic for certain people and no technology is going to solve that other than having a pause button. So it's a design decision. Make it very easy for people to be able to pause this if they're distracted by the constant motion.

Or what I actually argue for is don't play it automatically at all. But let users choose to play it. If they want animation, they can hit a play button and turn that on. But everybody else doesn't have to be burdened with that.

So -- whose responsibility is all this? Going back to our five groups? We just talked about standards. There are accessibility standards that W3C provides accessibility markup that we need in HTML. And the web context disability guidelines spell out what needs to happen in order for web pages to be accessible and ARIA provides that additional technology piece that makes it possible for complex interactions to be accessibility.

So they've done their part. We've got accessibility standards. Then assistive technologies need to support them. They do a good job of that. Screen readers do a pretty good job. There's room for improvement but not bad. Dragon Naturally Speaking has not historically done a good job. But in version 13 they did add some support for ARIA. Which means the problem with Dragon Naturally Speaking is a lot of times you have what looks like a button and it has text on it and as a speech input user, you can say let's say that button is a play button and you would say click play and you would expect that to then trigger the play button. Same thing as clicking often a play button with a mouse. But, if that button isn't really a button, then dragon doesn't understand what you just said. It's only listening for things that it knows are clickable like links and buttons. So, if it's coded with something neutral like div or span, then that's not something that dragon recognizes as a button so you can say click play all day long and it's not going to understand what you're talking about.

But by adding a role equals button so that markup, then dragon as of 13 then says Okay. This is a button and then it will understand when you say click play.

So that's where assistive technology hasn't been very good on speech input side of things. But now they're starting to catch up and the screen readers have been really working hard to support this stuff for a long time. What about web developers and content authors? That really is where there's a lot of burden right now that you all here are creating things need to understand what the standards are and you need to develop according to those standards.

So web authoring tools. Ideally, you won't have to do so much as developers.

You can just use tools that support the standards. You can use libraries that have the widgets that you want to plug in to your web page and they're all already coded for accessibility so you don't have to worry whether that stuff. They're just accessible. And you just choose to plug them into your web page and off you go. But we're not quite there yet. We're at a point where web developers really do need to understand kind of the nuts and bolts of how accessibility works.

Content authors do too. So, if you're filling out and adding content to a web page using an editor that's built in to the Web site, then pay attention to things like headings. Every rich text editor or most rich text editors have some means of identifying the headings on the page. So, if you're adding a lot of content to a web page and it's going to be broken up into different sections, then you're going to need to add subheadings to break those sections into different chunks.

And you need to do that not by making the text bold because then it's not a heading, it's pretending to be a heading but use the actual heading capabilities that are built into the editor. And sometimes it's hard to find. You have to look around in the different drop-down menus but it's there somewhere. Same thing with images, if you add images to your web page, make sure you add alt text to it and every tool that I know of allows you to add images to web pages also allows you to add alt text. And so you need to look around for that somewhere. Sometimes called alt text, sometimes alternate text, sometimes text description. Things like that. And we had a question.

>> AUDIENCE COMMENT: A question I often get is what guidance would you give someone around how to write alt text for an image. What are the things you want to keep in mind to express about an image.

>> TERRILL THOMPSON: That's a good question and really the goal is to describe the image succinctly and provide equivalent access. So when you think about what a sighted user gets out of this image, what you're trying to communicate, what its function is, that's what somebody who is using a screen reader or Braille device needs access to.

So we have here actually, the screen shot we're inserting an image of Mount Rainier using Flickr. This is the plug-in built into the Canvas learning system. Grab them into Flickr and web page but they come equipped with alt text. So that's nice. So the alt text for this image I'm about to add is Mount Rainier. And the question is is that good alt text. It's a photo of Mount Rainier. It seemed to be reasonable. But what if this is a geology course and my purpose in showing this image is showing how significantly the glacier is retreating over time. Then that's a very different thing that I'm trying to communicate. It's not just Mount Rainier, it's a specific detail. So that would need to be included in the image, in the alt text. So short, sweet, equivalent communication, but depends on context. There are really good resources out there on line. Really go into lots of different examples and scenarios and so forth.

Any questions about web pages before we jump into pdf? Here comes the runner.

>> AUDIENCE COMMENT: Doesn't HTML 5 address some of those ARIA roles that you talked about for navigation text?

>> TERRILL THOMPSON: Yeah. ARIA came first. HTML 5 came second

and HTML 5 actually added some tags that replicate the functionality of some of the ARIA roles. So right now we're in a state where there's some redundancy, role equals navigation is a good example. HTML there nav to get to tags. You could use nav as a tag instead of role equals navigation but right now I advocate using both because ARIA came first so there are assistive technologies that did not support HTML tags but did support ARIA. So users are still out there were those older versions. Just to make sure that you know, all needs are met for a little while anyway until it's reasonable to assume that people have caught up and have more reasonable technology, then using both is a good idea. Other web page questions?

>> AUDIENCE COMMENT: Do you plan to talk about Facebook and interactive media? Social media? Are you going to be talking about that later in the presentation?

>> TERRILL THOMPSON: Not specifically although the three examples I have is pdf is next and then I'm going to talk about video and at the end we can bundle them together and talk about them in whatever context they happen to appear.

>> AUDIENCE COMMENT: Great. Thank you.

>> TERRILL THOMPSON: Okay. John?

>> AUDIENCE COMMENT: Just a quick question about HTML 5. I heard from someone and I wonder if you heard this as well that HTML is accessible. So just do that and it will be accessible. I had to correct that person that that wasn't true but have you heard that kind of rhetoric or thought from others?

>> TERRILL THOMPSON: Well, it's nothing is automatic. That is something we need to watch out for is people that assume because they're using something that has some accessibility characteristics that it is automatically accessible and that there is always going to be a need for people to just be educated about how to use the tool. For another example as we're getting into pdf, if you save as pdf from Microsoft Word for Windows, it creates the right kind of pdf that has accessibility built in. Some people think Okay. I've got an accessible pdf because I saved as pdf using their proper techniques but they didn't do all the things that are necessary like adding headings, adding alt text. That has to be a manual process. They need to understand that they need to do that. So yeah, there are those misconceptions. And another question in the back. Here comes a microphone.

>> AUDIENCE COMMENT: Are you going to talk about some sort of the plug-in automated testing tools that people use to check if their content is accessible versus human testers at all?

>> TERRILL THOMPSON: I can since you prompted. And I should do that by referring you to my blog Terrillthompson.com.

I just wrote a blog post this week why I compare a bunch of accessibility checkers on how they did with this one page that we know has at least 18 accessibility problems and we know what those problems are. So I wanted to see which of the checkers could find those problems. None could find all the problems and most were half or less of the problems. So from are false securities there too and it's related to Shaun's question that people feel like I ran this through a checker

and I passed the checker. So my page is fully accessible. But in fact it may be very difficult to use and may have other problems that the checkers didn't reveal. So that too gives a false sense of security. We have a problem at the U-Dub, it's becoming more and more rare but for a long time people would say, "Yeah, my site is accessible. I ran it by Terrill."

[Laughter]

and in fact, the feedback that I gave them was your site really has a lot of problems but they thought just by having me look at it, they could check it off their list. Everything is good. So there's that other piece of the message which is the details that people sometimes overlook. Let's plunge into pdf. And the issues with documents are the same as issues with web pages. There are lots of similarities. We don't want a glob of text that has no meaning and a structure. We want a document that has structure. And pdf has the ability to do all the same things that HTML does. It has text that communicate. Headings are headings and lists are list and the ability to add alt text to images, you can do almost all of that. You can do almost anything in pdf that you can do with the web page. But not all pdfs are created equal. So there are three general types. The first is just an image where somebody scanned a document in and saved it as pdf. Just an image, even though it looks like it might have text, it doesn't have it at all. It's just a picture of text. So until you go in and convert that image into readable text, it's completely inaccessible. That's the worst type. But there are a lot of those out there. Particularly in a high volume area like libraries where they're scanning in journal articles and saving them as image pdfs and then students need to access those and they don't have the ability to read them. The second time is a document that has actual readable text but doesn't have any structure. That's the big blob of text which is technically more accessible because it is readable text. But without added structure this is impossible you can go there and say there's no way a person can read this. It's going to take forever.

The third type is a tagged well structured document. That really is what we're after. It's a special type called pdf. There's a tag pdf that has underlying tags mechanism that allows you to mark up the headings and headings and paragraphs as paragraphs and lists as lists and so forth.

So tag pdf was introduced in 2001. Does that date ring a bell from earlier in the presentation? What happened around 2000, 2001? This is the quiz portion.

>> AUDIENCE COMMENT: 508 standards.

>> TERRILL THOMPSON: Section 508 standards came out. 2000. The federal government was faced with we're not going to be able to use pdf any more because it's not accessible. So Adobe said wait a minute, let's see if there's something we can do about this. They introduced in Acrobat 5 this new type of pdf that had an underlying tag structure. So it's been around for a very long time. It makes it possible to do all the things you can do in HTML as I mentioned, or most of the things. The trick was you have to have an authoring tool that supports it. Even though that was 16 years ago there are a lot of authoring tools that don't use pdf. You can't get there from here. You create a document, headings and images and all that. And then when you go to save as pdf all that accessibility

work you do is lost. It doesn't get passed on. If you're doing it in the right tools, that's the trick knowing which tools support it and which don't. Microsoft Word for Windows does. So that's a good choice of tools. Again, you have to do all the right things up front. You have to use headings, add alt text if you're using images and list button in you're adding lists but when you go to save pdf, all that accessibility information will get passed to the pdf. Microsoft Word for Mac does not. So, if you're a Mac user, then you've got to save as pdf from Windows. You've got to find a Windows machine to do that or there's other work arounds too. If you wanted to know what those are, just ask me afterwards. So Microsoft -- we're hoping that they'll jump on board and provide the same functionality in the Mack version that they did in the Windows version but it's not yet. A lot of people are United Stating Google dogs to author. If you save as going docs you do not get a pdf. Adobe Einstein does but it's difficulty to use, that's may more I can get into in the time that we have.

So the thing is there aren't a whole lot of tools that create tag pdf even though it's been around but you can fix inaccessible pdfs, after fact, using Adobe accurate pro. No matter how created you can pull it into Adobe Acrobat pro. It has tools that allows a person to do that.

So that was just a quick look. The question then who's responsible for making pdfs accessible. Assistive technologies do support accessible pdf. So screen readers will read an accessible pdf and a loot of the same functions that you use in a web page work in a pdf if it's successful. Software and operating systems. Adobe accurate and Adobe accurate pro provide the accessible piece. Accessibility standards are there really the WCAG, Web Content Accessibility Guidelines tells us what we need in a document and pdf makes that happen. So supporting the standards.

The web authoring and development tools are falling short because they don't automatically create a tag pdf. So this is an area where that group really needs to do a lot of work to step up and make impossible for people to create accessible content with their tools. And web and content authors need to know how to create a successful document and which tools to use to save if they want to export to pdf, they have to now what the right way to do that is and what the wrong way is. So that's a huge group to educate and we're doing our best to try to get the word out there. And you know, encourage people to try to understand what that entails.

Questions about documents? Question in the front. Here comes the mic.

>> Section for comment in terms of pdf comment. As a screen raider user, the most challenging piece for me are the numbers of attachments and documents sent in pdf format. They're not readable. When you open an attachment it says, "Text not found" so it's actually even when you're sitting around attachments not as part of your Web sites and just information to distribute lists or others, those pdfs are really important?

>> TERRILL THOMPSON: Yeah, the percentage of pdfs that are tagged out there are very, very small. There's a huge educational effort that that's used to make people aware of this need that as you're creating documents, you need to be aware of your accessibility and just follow a couple steps to make sure your document is accessible.

>> AUDIENCE COMMENT: My question is the same thing now that the federal government is updating starts, anything put out by the federal government will have to follow WCAG? Is that correct? And I myself have my own Web site and I'm wondering how much I can do by myself. I isn't attempted it but do you know if it's available on doing or Go Daddy or Google do we have something that makes us accessible to our own Web sites?

>> TERRILL THOMPSON: You have to take some of that on yourself and hopefully the tools you use with create accessible content.

>> You can type in and say role and it would --

>> TERRILL THOMPSON: Ideally, you would do whatever you do to create your web page and the tool you're using would create a accessible -- I can't comment on those tools specifically but some tools do a better job of that than others. So that -- really the only way to know, you can get mileage out of using an accessibility checker and just see what kind of feedback you get.

I'll they're resources here at the end, too. But ultimately there's no substitute for knowing a little bit about accessibility or talking with somebody that can walk you through that. Yes. Question? In the front and then in the back and then at the back. Other back.

>> AUDIENCE COMMENT: I wanted to say that the Microsoft web version of Word when you want an accessible version it just generates a pdf and when you asked worked for Mac, were you referring to 2016, the latest version or the previous version?

>> TERRILL THOMPSON: Both. I'm really optimistic when I got 2016, that finally were going to solve this and I checked the pdf and still no tags.

>> They did a number of work in 2016. There's a number of places that's lacking.

>> TERRILL THOMPSON: Right behind you.

>> AUDIENCE COMMENT: Just a quick question about pdf. You can convert it back into word? I never looked at it but can you regain some of the funding?

>> TERRILL THOMPSON: I don't know that I've done it that way of the but I think -- I guess I can't really say without checking it first. He's shaking his head. So no, it doesn't work that way. But you have a tag in pdf that has accessibility. You import it into word, then apparently you use that -- you know, that accessibility markup.

And that work says a lot of opening documents and other word processing platforms. It's a mixed bag what gets accepted, the accessibility features that get accepted and those that don't gets pretty messy and complicated unfortunately.

>> AUDIENCE COMMENT: Similar we for Word. Which format because I've been told to make it plain text takes away all the formatting, and turns into pdf. I think there's a lot of confusion over the word it turns into tagged period of time pdf.

>> It depends on if you know your awed against, you can say yeah, I have access to Microsoft Word or something that will open Word docs which is a pretty reasonable assumption any wore. Then just providing the document in Word really is the best bet because it's got heading structure and it's got alt text for images and all of that. And if you then convert it to some other format, there's

always the chance that you're going to lose some of that functionality. So problem with the word is it is a commercial product. So historically we've said there's no guarantee that everybody in your audience has Word or a tool that will open it. But now there's so many free tools that support that format that it has become kind of a standard format. So I think best not to export if possible. And if that works for your audience.

>> AUDIENCE COMMENT: Just a brief statement to rely to -- is it Janice, you had that question about which Web site providers -- I won't name any names but the Internet is rich with great information if you just ask it. Is Word press accessible? Is WICS questionable, question mark, there's a lot of good information out there you can compare and contrast.

>> TERRILL THOMPSON: Let's move on to example 3. Videos, HTML 5 we talked a little bit about that. It is accessible. It had really cool accessibility features, this is the video tag and so to add video to your web page with HTML 5 is extremely simple. It could be simpler than what I have here but this is full accessibility. You have video tag and closing video tag at the end and inside of that you've got eye couple of source tags which is the video source, so you know, the -- you point to the video file and that's the video player that actually plays in the player. We provide a couple of those because not all browser the same video format. So MP4, Internet explorer and safari were all over supporting MP4, and Mozilla and Firefox and opera said no, we're not going to support MP4. There are licensing issues. So web M. is a format that with get around that. So any browser that doesn't support MPM probably supplies that. If you provide both one way or another I you have two ways to show the video. We have two source tags and more importantly the track tag that allows us to have time to text which is synchronized with the video. So captions will be delivered with the track tag. But so can descriptions. So you can have text based audio description which means the screen reader would read the description at the designated time just like captions get displayed at the designated time. At this place it would be subscriptions getting moved and red allowed by a screen reader. There are other different types of tracks that you can synchronize with the video. There are captions, subtitles. So other languages other than the native language of the video, audio description. Chapters which allows you to add organizational structure to the video. So people can jump directly into different parts of the video. And metadata which is pretty much anything else, anything you want to synchronize on the video, it will pop up messages that optimize the video, that kind of thing. It's possible with the track tag.

And it just looks like this. It's just sort of like a caption file. Just plain text file that has a start time, an end time and some text.

And then how that actually gets used depends on what kind of track it is.

If it's kind equals captions it gets displayed in the caption area if the user has titled captions on and if it iOS descriptions, it gets disclosed to screen reader users so they hear it with roll equals alert. They hear it at the best designated time. So there's a media player that we've developed, because even though this capability is built into the HTML 5 spec. Browser don't natively support most of what's possible. They support captions. I think every browser now supports captions.

In HTML 5. But none of them support audio description and none of them support chapters and other support metadata. So we've decided to just build our own. So we built our own HTML media player called able player which is a fully accessible player that takes advantage of what is possible with HTML 5. So here you see a screen shot of a video playing, an able played and one of the cool things we do is we take the captions and the audio description and we combine them to produce an interactive transcript. So we've got all the timestamps and everything. You reassemble that into a transcript and users can put getting that into a transcript to jump right to that point in the video and start playing at the video at that point. When I say click, that suggests mouse and obviously I'm the no mouse guy, take the no mouse challenge. This is optionally keyboard accessible as well. But it's a preference. So users can enable -- they can say yes to key bored accessible and then fab thousand the transcript and press enter or space to start playing the video at that point. That's optional because it could get in the way. That's a lot of tab stops that somebody is going to want to tab past the player and go in where else on the page. They don't want to gets stuck in the muddle trying to get through that script. They can enable that and tap through it. So able players is something worth checking out if you're looking for accessible media player on webbing pages, it has a lot of functionality that no other player comes close to matching.

This is what we're using on the Do-IT Web site. I think I've got that URL coming up. So captions are really a great example of Universal Design and accessible as a whole is a great example of universe it will design. Everybody benefits. YouTube doesn't have an interactive transcript function so, if you have a caption video, you can read the transcript, click anywhere in the transcript and play the video at that point. The captions can be translated into any language automatically. Any language that Google translates supports. But that's only good as automatic translation is. But it's pretty good. I heard from a lot of people that they understand the video. If they don't understand English, they understand the video better because it's been translated into their native language.

So that's all possible because we have captioned the video.

>> Hi there. I'm Adam. And I. A strong user of captioning. YouTube captioning isn't really where it needs to be because it uses an automated listening in order to pull it in the captioning and you get a lot of errors and a lot of missed captioning whenever you're using those speechreading text types of programs. So I'd rather have captions that are actually produced by human being and have them embedded into the films and rather than using those automatic sound type generated captions.

>> TERRILL THOMPSON: Yeah, we'd love to -- for YouTube or technology in general to be able to automatically caption things. Because there are so many videos out there, millions of hours of videos that will never be captioned, realistically. But, if technology were up to the challenge of doing it for us. Then that would be wonderful. But it's note there yet. I think it's gotten better. But it's still not suitable for actual use as captions. I would agree with that. I do think it's reached a point where it -- for some videos, if it's a clear speaker and a good acoustic environment with good production, then it's good as a starting point. And YouTube provides an editor that you can use to go in and edit those captions that it

came up with and if they're 90% accurate, then it's not too hard to go in and edit those and make them 100%. A lot of times if it's not very accurate, then it's easier just to start over from scratch. Just because when you're captioning you get a rhythm going that you don't go when you're editing existing changes. There's also that false sense of security thing. A lot of people think YouTube can caption this so we don't have to do anything and that's not the case.

So the screen shot I have here shows the many other applications of captioning. That there's so many things that you can do with video if it's captioned. This is something that was done with the last presidential election where during the presidential debates have this -- Al-Jazeera did this where they have the captioned text and it was broken down by who was speaking and you could search for a key word that you wanted to do to figure out what said this word and in what context. For example, I six for America and it shows that Mitt Romney said America more often than Obama did and you can look at the timeline and say Okay. When did they say America? And you can click and go right to that point in the video to see what the context was when they were talking about this. So it opened up some doors for us, this analysis. It wouldn't have been possible if this wouldn't have to have been captioned. Just to show you an example of some of the possibilities that are out there by having this accessible.

So whose responsible then for making videos accessible? We've got the standards that tell us you know how to caption a video and we've got, you know, software and operating systems that support captioning video. You can play video in all the browsers, HTML 5 video, Vimeo supports captions now, how do we get video captioned? Tools might be able to do it for us. It comes down to us authors again to just taking that extra step to make sure if with you do produce a video that I also get it captioned and there are lots of free tools out there that make that process very simple and actually kind of fun. So depending on how much video you're producing, you know, knowing what those tools can be very helpful. We used a term called Amara that is a really nice tool that supports free crowd sourcing of captions, you put a video up there and everybody can come and work together collaboratively to caption that video. There are several tools like it. But that same functionality. So the road to better accessibility is long. But it's pretty beautiful.

And if we all work together, I think we can enjoy that road. There is a lot of work to do. One area where we can all continue to work together, continue the conversation is the Seattle accessibility camp which is in the very early stages of being sort of thought about and figured out. But if you're interested in staying abreast of this, this would be eye one-day event, probably 1 or two days, but where people get together and brainstorm and share ideas about technology accessibility or maybe accessibility more broadly. But just a big community event surrounding accessibility. If you're interested in that, then there's a Web site where you can get your name on a mailing list and we'll send out announcements to anybody who signs up. That is [tiny url://awwysea2017](http://tinyurl.com/awwysea2017).

So [tiny URL.com](http://tinyurl.com/awwysea2017), a11ysea2017. If you need that later, corner me and I'll be happy to share that with you. I think we're looking at doing it in January or sometime early next we're. A bunch of other resources. This is my last slide so I'll

leave this up. Kind of the hub of all things related to able technology at the University of Washington is UD.edu/accessibility, second slide gives you lots of resources are document, video accessibility, we've got links that we find would be very helpful. How to guides for campus community but other people with use them too. Walk through step-by-step on how you create an accessible document or web page. That sort of thing. There's 30 web accessibility tips which is a nice resource. Their able player, my blog, Terrillthompson.com. And these slides are available via this event. We all had process. There's a flyer up front that works as a bookmark but, if you open it up it's got accepts on accessible web design. I brought a bunch of those, more than enough for everybody here, I think. And feel free to take a few extra and spread them around. Spread the knowledge.

So I've only got 10 minutes left officially. But I'm happy to stick around as long as we're allowed to stick around and answer any questions that you have. So one up front.

>> AUDIENCE COMMENT: In your role at the university, do you have any ability to vet the tools that are used and one thing comes to mind for example Google Docs I know is used and Google spreadsheets at least on the Mac is not the most successful thing. Do you have the opportunity to get feedback as with the voice universities thinks is a difficult tool for people to use some people in the class use a screen reader or some other technology that the technology doesn't quite meet yes.

>> That's a good question. We do in fact try to be at the table and proactive with major procurement ideas. So we're actively working now with U-Dub procurement to develop procedures by which whenever an RFP goes out, accessibility language is included in that RPF. So then we know that accessible products and then when they come back with a response, that's kind of the tricky part because there's so many things that purposes, but with major purposes we want to be at the table as a resource and helping them to judge those responses that come back from vendors, we want to be able to look at product and see if it's successful and we want to -- if its not accessible but it's the front runner, then we want to be able to interact with the vendor and talk with them about their disability and collaborate with them to help them understand what their needs are. So we do do that and are very actively engaged with a number of vendors right now helping them to address their accessibility. One of things we're working on now and hoping to get to is actually have accessibility built into the contracts where if we can say we realize that you're not accessible now, but you expressed a commitment and you know, we -- here's a roadmap and we expect you to meet certain deadlines in route to improving accessibility and if you can do that, then we'll renew this contract next year, that kind of thing. So we're making progress in that area and hope to see that. Hope to drive the market for accessibility. Particularly if it's not just us but other institutions that are doing the same thing and there are actually quite a few. There's a movement in higher education to -- the demand is demanding from accessibility vendors. The more I hear interest that all of us, the more they're going to understand this is a serious market opportunity. Nobody is successful so we could be one of the most successful, that's going to position us above the competition, that's the message we're trying to communicate

to them. Question in the back.

>> My name is Marcy carpenter and I'm president of the National Federation of the Blind of Washington. The National Federation of the Blind offers a lot of cutting services with a lot of resources available to help companies and government agencies with accessibility questions. We also have people -- our members who use a lot of assistive technology who are available to do human testing so I'll be around after the section if you want to talk to me?

>> TERRILL THOMPSON: Okay. Thanks for introducing yourself.

A. Other questions? Another question in the front.

>> AUDIENCE COMMENT: My question is -- guys to the -- again to the test that you access user ability and sometimes there are different things there. But I know a lot of people use a tool like a plug-in tool to check for accessibility. Some people may use in-house staff. Does that seem accessible? 12 JAWS raiding this or whatever (A and most people skip the most important phase which is the most important, third party user testing for actual users. So what are your thoughts on those three phases we need to work together to create an accessibility environment once you're creating a Web site and other things.

>> TERRILL THOMPSON: There is no substitute for user testing in particular. We talked about accessibility checkers and the limitations for those. Also big limitations with input that comes in from vendors, vendors will often fill out a VPAT a which is a checklist of how they feel they perform on accessibility. And sometimes those are just either blatantly false or they don't -- they don't understand how to evaluate their product for accessibility. Or you just don't get all the information from them. So you have to look at what the vendor is telling you but you also have to question that. You have to use automated checkers if they're available and you have to develop in-house expertise in order to be able to make intelligent decisions as you look at products but ultimately there is no substitute for having users test and that can be challenging because then you have to figure out where do the users come from. We're fortunate with do-it having been around since 1983, and constantly we have new students coming into our program that we have a large body of students that we can tap into and we're always looking for ways to empower them and get them involved in checking you know products or captioning videos or you know, doing other things that related to accessible technology that's going to help them develop some skills and advocacy skills and technology skills but also provide a benefit to us.

So we've talked about trying to fit ow how to harness that community we have and make it available for others. But so far we don't have anything formalized there.

But mentioned NFB is available to do some of that stuff (A there are other groups as well.

>> AUDIENCE COMMENT: Hi, I'm Cheri Perazzoli with the Hearing Loss Association of Washington. And I'd just like to give a big shoutout to Irene Stewart for making this program what we call hearing friendly or hearing accessible because most places don't think about how people are going to hear when necessity have a program. So the key -- they have a program. So the key to hearing friendly programs is to start with a microphone. And so you'll see that the

presentation was -- had microphone access all the way around and I really appreciate each of you taking -- having patience in waiting for the microphone to show up. Irene also went above and beyond and has arranged to have all of her meetings CART are CART captioned. And ASL is available.

So I really like everyone to think about how people are going to hear your message they need. And I strongly encourage everyone to think about -- really think about captioning your videos, any content that does not have captioning is not acceptable to people who have any kind of hearing loss or who may be deaf. Thanks again.

(Applause)

>> Terrill, thank you very much for this information. It's amazing to me how consistent the message is whether digital communications or built environment, that it's really so much easier to consider different abilities up front than it is to try to fix it later. So this is great information and I really appreciate all of you being here today. I would also really encourage you if you'd like to join the list serve for Northwest Universal Design Council, you can access that at our Web site. [Environments for all.org](http://Environmentsforall.org).

I don't know how accessible it is. Irene, have you tested it? Irene Stewart.

>> Irene Stewart: We're in the process on all of our Web sites.

>> We're all learning here. Reminding me too, Wendy -- your last name, Pender is from Bellevue libraries and has some information on the front desk up there. Along with information relevant to the meeting today.

On assistive technology accessibility and resources fair that's going to be at the Bellevue fair Saturday May 14th. You might pick up information on that and plan on attending that as well. Again, thank you for attending today. Think, Irene, one of the things we encourage with the council is getting people of like minds together. I encourage you to network as much as you can with people around you and carry this forward. So again, thank you, everybody. Big round of applause.

(Applause.)