

**LILY BOND:** Welcome everyone, and thank you for joining this webinar, which is entitled "Demystifying WCAG 2.0, An Intro to Web, Office, InDesign, and PDF Accessibility." I'm Lily Bond from 3Play Media and I'll be moderating today.

I'm thrilled today to be joined by David Berman, who is an internationally acclaimed expert in web accessibility as well as the top-rated speaker on the subject. Thanks to his leadership and experience in the field, David has been appointed as a high-level advisor to the United Nations Global Alliance for Information and Communication Technologies and Development and has spoken in over 40 countries in the past few years.

We have about 45 minutes for his presentation, followed by 15 minutes for Q&A. So with that, I will hand it off to David, who has a great presentation prepared for you today.

**DAVID BERMAN:** So you remember-- for those of you who [INAUDIBLE], it's great to be back with another 3Play webinar. You know, 3Play's down there in Massachusetts. We're up here in Ottawa, Canada. And I'll tell you why that matters soon enough.

For those of you who already know me or have seen me at events anywhere in the world, last time we had our webinar, I had my big bag of tricks here and I pulled out all of these wonderful visual challenged goggles and fun toys. But this time I got something new. And of course, the famous Spice the Cat.

But this time, I'm starting off with something kind of amazing. And what I wanted to show you-- because this is a tool. I've been using it to actually-- I've been controlling my computer with my eyes. I've actually been controlling my computer by moving my eyes around and blinking as a click. So moving the eyes around is like moving the mouse and blinking is like clicking on the mouse.

I've got a bit of a story about this to tell you. The guy I'm showing a picture on here is a web developer in Israel. His name is Gal Sont. Now, Gal Sont has ALS, which for those of you who know about ALS, you know it's a degenerative condition that over time, he's losing more and more of his motor functions.

But Gal is an unstoppable guy, and he decided that he wants to keep developing code for the rest of his life. So what he started to do was to develop technology that would allow him to

continue to be a developer, even when he can't use his hands or his legs anymore. And so he decided to focus on creating an onscreen keyboard, which was truly designed for someone who is quadriplegic or has another substantial mobility challenge.

And we've been working back and forth with Gal and his team, refining these technologies. Because we've been working with someone here in Ottawa who I mentioned last time. We have a friend who is quadriplegic and also would really benefit from being able to control the computer with his eyes. Now, Gal still has use of his voice, but he knows that's going to go over time. So his plan is that using an eye tracker like this one or one from Tobii, another Swedish company, it becomes possible for it to track where his eyes are, as well as use the blink of the eye to simulate a click of a mouse.

So we took Gal's technology and we mashed it up with another piece of technology called GazeSpeaker. Because I want to introduce you to another remarkably unstoppable person I know. This is Rabbi Simes. He's also known as the Rolling Rabbi. He's a blogger.

Now, Rabbi Simes unfortunately, due to an accident, went from being fully mobile able to living as a quadriplegic, and that's not likely to change very soon. As well, unfortunately, on top of that, he had to have a tracheotomy, which means he lost the ability to use his voice. So he had been blogging just with voice recognition software, but now he couldn't even express himself that way.

So we decided, how can we find a way where Rabbi Simes can blog again? And that's why we connected with Gal and got together. And I was so proud. You can read my blog about this. We tell the whole story. But we got to the point where Rabbi was able to communicate again with his family for the simplest of thoughts, by being able to use the eye tracker and being able to move around on this onscreen keyboard and express his love for his family and his desires, but also to get blogging again.

You know, it's these situations that-- part of why we love what we do. When we can replicate these successes globally, it's especially thrilling. What I really love about the solution we came up with for the Rolling Rabbi is that this device only costs \$125. And we were able to take a Windows tablet, \$125 worth of hardware, and some off-the-shelf software, and we were able to create something that even five years ago would have cost \$35,000.

It's not just about accessibility for people with disabilities. We have to make sure things are accessible in a way that's accessible economically, when we realize how many people we're

dealing with when we think about accessibility issues.

Now today we're going to cover a lot of things. But I want you to know that there was a time for me, just like many of yourselves, where as a web designer I thought, oh my. If we're going to do all these things to make a website accessible, is our site going to end up looking really ugly? And I want to assure you today that we can come up with a solution, a roadmap, that includes no trade-offs. Whether it's our websites or our documents, we can have user experiences which are just as thrilling and intriguing as ever, in fact, even more so, that includes everyone.

But first, I want to dwell on the five reasons why we need to care about accessibility. Now, the one thing that's been making headlines lately, especially in the Northeastern US, is the lawsuits that occurred with Harvard University and MIT, where they were actually being sued over not having closed captioning for all of their videos.

And that's just one part of a larger challenge about accessibility. Because when we tend to think about accessibility, when we tend to think about disability, we tend to think about extremes, someone who's blind since birth or someone who's never heard anything or someone who can't use their limbs at all. But in fact, the vast majority of disabilities are much more subtle. In fact, Lily, we were talking about doing a poll about how many people are living with disabilities globally. Could we do that now?

**LILY BOND:** Yeah, absolutely. So everyone should see on the screen now a poll question which reads, "Does at least one of the things David just mentioned apply to you?" But we should rewrite that to say--

**DAVID BERMAN:** Yeah. If you don't have the ability to see the future, then I should give you my list first. So Lily, we're just jumping ahead there, but should I go ahead and list off my list, Lily?

**LILY BOND:** Yeah. I think that would be helpful.

**DAVID BERMAN:** All right. So this is what we're up to. People talk about how many people in the world live with disabilities. And out of 7 billion humans, sometimes we hear bandied about 10%, 15%. I want to get a sense of how many people are living with disabilities that are in the audience today. Because I understand, Lily, we've got about 650 people with us today, 680. Is that right?

**LILY BOND:** Yep.

**DAVID BERMAN:** So here's my plan. I'm going to list off a whole bunch of challenges. And then Lily is going to ask you to vote. And if you have at least one of the things I'm mentioning, I'd like you to virtually raise your hand using the interface.

So here's my list. So are you blind? Can you not hear some frequencies of sound? Or are you completely deaf? Do you have a mobility challenge? Are you quadriplegic, which would mean you have no use of your limbs below your neck? But have you ever had your arm in a cast for more than two days? Do you have carpal tunnel syndrome?

Do you wear eyeglasses? Have you ever worn eyeglasses? Have you had laser eye surgery? Are you colorblind? That is, do you not see certain frequencies of light?

Do you have an attention deficit challenge? Like are you already getting bored with my list? ADHD, dyslexia. Is English not the language you grew up in? Was it a language you learned later in life and yet you're living in an English-speaking country-- in a primarily English-speaking country?

There are more things. Do you tend to spend most of your time in a wheelchair? I could go on. Are you left-handed? Are you pregnant? Are you drunk? Are you stoned? Is that enough of a list, Lily?

**LILY BOND:** Yeah. I think that's a pretty solid list.

**DAVID BERMAN:** All right, then. Because I'm seeing already-- can we see how many people are voting so far?

**LILY BOND:** Yep. I'll give everyone just 10 seconds just to finish up if you haven't voted yet, which is certainly prompting a lot of you to get your vote in.

**DAVID BERMAN:** Does at least one of the things David mentioned apply to you? And if I missed any type of challenge, you're welcome to add it to your own list.

**LILY BOND:** So I'm going to share the results now. Almost everyone voted.

**DAVID BERMAN:** Wow. 72%. So I'm seeing 72%. That's such a larger number than the numbers we're given by the ADA or [INAUDIBLE] government of Canada. We talk about 18%, maybe 20% of people living with disabilities.

And the thing is that if you're planning on living past the age of 45, you might as well raise your hand as well because your eyesight will begin to go at a certain point. And that's not even to

mention the temporary disabilities. We'll get to that a little later.

So one reason to care about accessibility is simply we're dealing with, let's say, 76% of our audience. We don't want to miss out on that market reach. We have a service to provide. That's an incredible amount of people not to be reaching.

Second is Google's SEO, you know, Search Engine Optimization for search spiders. Consider that for web searches, Google itself has significant cognitive disabilities. Perhaps Google has the mind of, perhaps, a three-and-a-half-year-old or a four-year-old when it comes to organizing information. So when you organize your website in a way that accommodates accessibility, you're also going to get more Google hits and more relevant Google hits.

The third reason is a human resource issue. If 72% of people are living with some sort of disability and you're doing hiring, you're trying to hire or retain the best people, you're missing out on some of the best people if your own organization isn't organized in a way where all your documents are accessible to everyone. And not just to read the documents, not just to consume them, but to actually author them as well.

And then there's the social justice argument, just the love argument of, hey, it's the right thing to do. We're all going to feel better if a part of our civilization is not leaving anyone behind.

But indeed, what we're seeing lately is the expectations in the legal world are rising. And whether that's regulatory, whether it's ADA, or up here in Canada AODA, or federal government legislation, or the legislation in Norway or Oman or Australia, the expectations of society are rising. And so some organizations are finding themselves reacting to lawsuits and other demands.

And the reason why it's poignant that we're up here in Ontario sharing our experience is that in a way, you could say Ontario, Canada is ground zero for web accessibility and document accessibility, and here's why. See, we were hired by the Web Index, the Worldwide Web Foundation a couple years ago to do a benchmark study of how countries all around the world were doing. And you can see on this map, you see how countries like Canada and the United States and Australia are doing best. Indeed, Canada ranks in the top two, three countries every year regarding questions regarding accessibility when compared to other countries.

And the reason for that is that Canada had the first government in the world, first federal government to make it against the law for any public-facing page to not comply with

international standards for web accessibility. And indeed, if I do a Google Trends search and I look at the zones in the world that come up first, you'll see Ottawa-- that's where I am right now-- and Toronto, the capital of Ontario, the province I'm in, are in the top seven or eight cities in the world for responses about web accessibility online.

And the reason why Ontario is so strong is because Ontario is the first place in the world where not just government but private sector companies also have to comply. So starting with deadlines that took hold the beginning of last year, every company in Ontario that has at least 50 employees has to have a public-facing website that includes web pages or documents which comply with international standards for accessibility. Norway has gone even further, because Norway did a similar thing earlier this year, except their standards are even higher.

And so it's something we're seeing going around the world, but even going back in time. I want to share with you a little bit of history. Because the idea that when we design for the extremes, everyone benefits goes way back in time.

So back in the 1870s when Alexander Graham Bell was trying to-- we think about Bell as being famous for putting a phone in every one of our pockets. And of course, we don't want to go anywhere without our phones. But Bell didn't set out to design a telephone, not at all. He was actually simply trying to improve the learning experience at a certain school for the deaf in Massachusetts back in the 1870s. And he starts a parade of invention. And on the way he ends up inventing the microphone, the transducer, the loudspeaker, and the telephone.

Now, Bell passes on, but his company goes on. He has a company called Bell Labs. And Bell is involved in the '20s and the '30s inventing better and better hearing aids so everyone can hear better. So this technology starts going mainstream. But after the Second World War there was this breakthrough where Bell Labs decided they wanted to create a hearing aid that would be small, have a great signal-to-noise ratio. And in order to do this, they invented the transistor.

The transistor, its worldwide rights get bought up by a guy named Akio Morita, who's a gentleman in postwar Tokyo and says, hey, this transistor, maybe if people who can't hear very well need a way to have portable, better sound everywhere they go, why don't I create the transistor radio? So Akio Morita buys up the worldwide rights for the transistor for \$25,000. His family thinks he's crazy. And Bell said, they thought they were done with the transistor once they had the hearing aid.

Well, what comes out is a company called Sony. We end up with commercial radio getting a reason to rise, then commercial television. Meanwhile, these transistors are in every laptop and smartphone and satellite. Well, they take us to the moon and back. But it all starts off with people trying to design for the extremes. And when we design for the extremes and we do it well, everyone benefits.

And indeed, now is the perfect time. Because if you don't know this stuff, then you're kind of brilliant. Because when we started teaching you how to make websites and documents accessible back in the late 1990s, it would take three times as long to teach, and it would take 10 times as long to get it done. But right now it's the best time to learn. Because we live in a world where there's never been more awareness for the value of making everything accessible to everyone. And the tools and the techniques have never been more available. So this is the perfect time to find out all about how to do this and to figure out a way to do it without trade-offs.

But what I find is-- Lily, you were kind enough to mention our course coming up on June 29 in Toronto, which people can join us remotely, by the way. You don't have to come to Toronto, though of course, if you've never been to Toronto, you've got to come to Toronto. If you don't want to come to Toronto, you can join us online.

One of the things we learn is if you want to do this well, if you want to do it in a way that drives down costs rather than increased costs and includes your entire audience and doesn't cause a trade-off of experience for the quote, unquote, "mainstream" user, it's really important to understand the type of difficulties people are living with. And so I'm showing a list now of the type of disabilities there are. And I was saying earlier that there are far more temporary or episodic disabilities than there are permanent ones.

So for example, let's say you're at the gym and you're on the treadmills. And there's five treadmills in a row, and there's five televisions up on the screen. They turn off the volume on the televisions because otherwise it would sound crazy. Because people are listening to five different channels. And so they turn on the captions. So when we find ourselves on those treadmills all reading captions, we're all having temporary auditory deficit. And we all love having the captions. By the way, so does Google because we can search those captions for content.

Or let's say I'm at the office and I print a document on a black and white printer. Well, if I hand

out black and white copies of my course material, everyone is temporarily color blind. So if I don't design my documents in a way that works for people who are color blind, then they're also not going to be clear when I hand them out on a black and white photocopier. And so everyone experiences disabilities perhaps every day temporarily, even if you're not living with a substantial and permanent one. And so that's why it's so important that we're going to walk through the different kinds of challenges that there are.

So for instance, some people are living with visual challenges. And this could be everything from having never seen and may never see to just missing out certain frequencies of light like me. I'm a color blind graphic designer. And that's been really interesting.

Or dexterity challenges. This could be everywhere from someone who can't use their limbs at all to maybe a temporary disability, because you've got one armful of groceries and you've got your phone in the other hand, you're holding onto the pole in the bus and you're trying to keep from shaking over. So all of these situations affect your ability to use your technology.

Hearing difficulties. Again, you could hear nothing at all, or maybe you don't hear things so loud. Or maybe there's a lot of noise in the background and you just can't hear right now, because there's an alarm going off in the building. So it's important that the signage not rely on sound.

We also have language and speech challenges. Some people just don't know the language you're trying to work with. Other people are wired differently-- the way language comes in, the way language goes out.

And then there's a whole range of kind of a neighbor of language challenges, cognitive and learning difficulties. And it's especially challenging because it's not always apparent to us that we're interacting with someone who has a cognitive challenge. In fact, sometimes people with cognitive challenges aren't even aware of them themselves. They may be in denial or they may just not be aware.

In fact, we do a lot of work at Carlton University. I run something called the Carlton Access Network I'm chair of there. And over 80% of the university community that comes to the accommodations desk at Carlton, it's not about people who can't see or people who can't hear or mobility challenges. Over 80% of the challenges are cognitive and learning difficulties. And I'm sure it's the same for you for many of your campuses.



Have we got a question I should be answering? I'm sorry. I'm having trouble seeing the questions. Could you just [INAUDIBLE] for me to see?

**LILY BOND:** David, we're also going to compile all of these to answer at the end. So that should be fine if it's hard for you to see them.

**DAVID BERMAN:** OK. Thank you so much, Lily. One of the challenges we have with dyslexia is, for instance-- and I'm going to use my cat to explain. Because how we distinguish ourselves from so many of the other animals is our ability to read, to record knowledge over time. And the dolphins would probably rule the planet if they had opposable thumbs. But they can't write stuff down, so they have to reinvent their culture every generation. But we get to write stuff down.

The thing is that the alphabets we use most often assume that the symbols change their meaning as you rotate them. So if I'm holding up a cat here in front of the screen and I say, this is a cat, if I rotate the cat, it's still a cat. And if I turn the cat upside down-- the cat's name is Spice, by the way-- it's still a cat. And our children expect that. And in the forest for 7,000 generations we've expected that.

But just for the last 3,500 years we've been using these symbolic alphabets where you take the letter D and you rotate it, and now it means something completely different. You rotate it again, it's something completely different. Humans aren't really wired for that. And for those of us where that becomes most apparent, that's one aspect of dyslexia, which we give a name.

Now, the wonderful thing about when we live, and this is the first generation in 7,000 generations of humanity, we happen to live in the first where we have so many amazing technologies which can overcome permanent or temporary absence of a human sense. And I'm going to show you just a few examples of those. Typically, what we do is we either will swap in a sense that's present for one that's not available, or we'll magnify.

So in this case, let's say there's words that are very small. Well, all of our operating systems now have ways of making them larger. And of course, on our very small screen devices we all enjoy pinch-and-zoom interfaces that make things larger for us when we can't see them so well.

We have devices. This is a device invented right in my hometown, where a pair of goggles takes the information coming in and microprocessors reform them in a way which work better for someone who can see but sees differently than most. This type of technology where you

can track your nose and your eyes actually started out also here in Ottawa at our National Research Council of Canada. And that's the technology that now we see falling into the eye tracking devices like I was showing earlier with the Rolling Rabbi.

But of course, these technologies right now, we're using them for extreme situations. But imagine what gamers are going to do when every laptop has eye tracking technology built in. Imagine what it's going to be like walking down the street when people are going to have their iPads and they're just going to be staring at the screen and blinking a lot. Because once you can use this stuff, everyone wants it. And that is so often the case.

It's the same with something like Siri. Siri is based on technology that was based on Dragon Naturally Speaking. Well, if you go back in time 25, 30 years, these are technologies that were originally designed for people with extreme disabilities. But now we all want our ability to have voice recognition, whether it's Siri or Google Now or Windows' version of that.

And so I've got a lot of examples of these things. The one that's used most often, perhaps, though, is when we talk about testing websites, we're often dealing with the challenges of someone who can't see. And typically, we'll either have the technology read things out loud or they'll use a Braille device.

We tend to think about Braille as being on printed devices. But if you've ever had a chance to play with a dynamic Braille display-- I'm holding this up right now. This is actually a smartphone. This is an Android device for someone who can't see, smartphone. And it's got a Braille display where these pins pop up automatically. We'll just put them right up there to the camera so you can kind of see. So the pins pop up automatically to present what's going on, and the other controls allow you to type in Braille as well with a six-button interface.

So we have all these amazing technologies. And we're in the first generation who has them available, so there's no reason to leave everyone behind. And there's no reason why we can't create a world where everything's accessible. So in an idealized world, everyone would have access to all information on any device at any bandwidth in any format. And you know what? We'll never get there.

I want you to know we'll never get there, because I don't want you to be intimidated. When someone says you have to make your document or your website perfectly accessible, that's really difficult to do. The good news is you don't have to make it perfectly accessible, just like there isn't a software product on the planet that is bug-free.

What we do is we establish very clear minimum standards. And this is the case with the ADA. It's the case with the AODA. It's the case with WCAG, PDF/UA. I'm naming off a bunch of acronyms that I'll explain shortly.

The key is as long as we build into the roadmap of how we build our documents, whether it's a website or a PDF file or a Word document or a PowerPoint presentation, we have a recipe for every one of these to build accessible publishing in. And the key to it, the key to drive down the costs, and the key to make this delightful and truly accessible, is not to wait till the last minute. In my chart here, I have a nine-step process-- waiting until step 8.5 to say, oh yeah, yeah, let's make this accessible.

No. The most important thing you can take away today is that we need to build accessibility in every step of the way, not just so everyone can participate in creating accessible content, but so we can make it part of how we roll. That's where we really start getting the payoffs.

Now, I mentioned these common standards. I mentioned a minimum standard. And indeed, it can be overwhelming. But people tell me I'm pretty good at demystifying this.

And I'm focusing in today on something called WCAG as well something called PDF/UA. So for those of you familiar with it, you may know that there was a WCAG 1.0 and now there's a WCAG 2.0. And WCAG 2.0 is pretty well the international standard for web accessibility. But although these guidelines were established for web, they've also been applied now to all kinds of documents. And so for every other kind of document except PDF files-- we have something special for them-- we apply the success criteria of WCAG 2.0.

Now, I won't be able to go over that all with you today. That's more of a full-day kind of thing. But I can explain to you that in WCAG 2.0 there are three conformance levels. And we can say a product is compliant with level A if we follow all the level A rules.

We can say a product is compliant with level AA if it follows all the level A rules-- that's 25 of them-- as well as the 13 level AA rules. So to have a AA compliant product, you need to meet or exceed 38 rules. Some of these rules are really easy. Some of them are pretty challenging. Some of them are purely editorial. Some of them are very nerdy and technical.

But the good news is learning this makes sense. Because every government in the world, every corporation that's setting a standard is pointing towards WCAG 2.0, either level A or AA,

as what they aspire to. So I'm showing a slide here of governments all around the world and how their standards all point to WCAG.

So you learn this one thing and you're good. Except there's an exception in the United States, which is soon to be a non-exception. You see, America gets credit for being the first country in the world to really establish standards for making sure that things are accessible. And in that, the US government established something called Section 508, which had a list of ideas for how you go about creating electronic experiences or information and communications technologies that comply. Section 508 had 14 rules. There are [? labeled ?] A through the letter P.

However, right now a Section 508 refresh is in motion. And so before the year is out, we'll be in a world where the new Section 508, the refreshed Section 508, will instead point to the same WCAG 2.0 AA standard that the rest of the world has embraced. And indeed, in this chart I show you here, I show I did an analysis here to demonstrate that whether you're working with the old Section 508 or the refreshed Section 508, if you aspire to these WCAG 2.0 rules, you've covered off both.

So as long as you go to WCAG 2.0, you're good. You've covered existing Section 508 requirements as well. And so Ontario did the same. So we've established these deadlines that I mentioned earlier.

So now what I want to do is show you examples of how some of these WCAG 2.0 rules unpack. I'm going to unpack a few rules just to show you how WCAG applies to websites, to Word files, to InDesign files, to PDF files, to PowerPoint files, to Illustrator files, to LiveCycle Designer files, to Excel files. Every file, even e-learning, we've got ways of doing that. What we've done is develop recipes so that every one of these can be accommodated and even exceeded, so people can be delighted no matter what container you're shipping your content in.

Now, WCAG 2.0 is broken down into four principles. And I'm going to show you just a couple examples from principle one, which is the perceivable section, which has the most stuff. I also want to explain that you may remember I had mentioned before that WCAG was designed for web, because WCAG stands for Web Content Accessibility Guidelines. It's not surprising that people needed a standard for documents.

And so just about a year and a half ago, W3C, who publishes WCAG, issued a new document

called "WCAG 2.0 for Non-Web ICT." And what it does is it helps you take all of the WCAG rules and apply them to documents as well. So we now have this interpretation where we can apply WCAG to documents. We need to be equipped with this in order to be able to apply it to documents.

The other exception I mentioned is PDF files. Now, you see, you may be creating a Word file and you may publish it as Word, or you may create a PowerPoint and publish it as a PowerPoint. But just as often as not, people will take that Word File and turn it into a PDF. Or if you're creating something in InDesign, well, you're never going to publish an InDesign file because people can't view an InDesign file. You're always going to turn it into a PDF.

So the key is, how do we create accessible PDFs? Well, first of all, some wise people, mainly in Europe, decided that WCAG was a bit of an unnatural fit for PDFs. So they decided to establish a global standard for accessible PDF, and that's called PDF/UA. So when we're creating accessible documents, we have a choice. We can either try to make it a PDF/UA compliant document or we can make it WCAG 2.0.

Now, for those of you in the United States of America, it's good to know that the ADA, the people who take care of Section 508, have already declared that PDF/UA is their preference for when we're deciding if a PDF file is accessible. The UA stands for Universal Access. So PDF/UA is a set of 31 checkpoints to make sure that a PDF file is accessible.

Now, the good news is WCAG and PDF are very similar in their content, so there's a huge overlap of the two. PDF/UA is a little more technical because it's pinned down to PDF files. But whether we're going with WCAG or PDF/UA, it's important to recognize that the key behind making a PDF file is any PDF file-- there's millions of them. And a subset of those are called tagged PDFs. They're a PDF file that has the hidden programming language within the document that duplicates the content again in a programming language we call PDF tagging.

It would have been a lot more convenient if they would have just called it PDFML, because PDF is just another markup language. And so if you're familiar, let's say, with HTML, you'll find-- and I'm showing a little chart to this effect-- you'll find that for the most part, the markup language in the PDF is very similar to HTML. But there are some important differences.

The thing is, why PDFs are sometimes very difficult to make accessible is that PDF can be much more graphically rich than a typical document, and we have high expectations. When PDFs were first invented, the idea was to create a perfect replica of a document. So if you give

me a PDF file that's not a perfect replica of my print document, I'll complain that it's not right. It has to have just the right fonts and just the right colors and bleeds and all kinds of special effects that are supposed to be flawless.

Whereas the web page, we're much more flexible. Our culture says, oh yeah, if that web page looks a little different on Firefox or on Chrome or on IE or it looks different on Mac or Windows, we find that completely acceptable. So we hold PDFs to a higher standard, and that's why making PDFs that are accessible can be more difficult.

It's not because accessible PDF is harder to do. It's that we expect more of a PDF. And when PDF becomes really complex, like a fully fillable PDF or even a PDF with dynamic layout or that has an online relationship with a server somewhere or [INAUDIBLE], it goes on and on. And so a PDF file can get as complex as the most complex interactive website.

The key to making accessible PDF work well, then, is to go to the source. We go to the source and we say, let's try to build accessibility into the source document. Because every PDF starts as something-- Word, PowerPoint, Excel, InDesign, LiveCycle. LiveCycle is a special tool from Adobe just for making great forms. They all start off as something else. If we build the accessibility into the Word document, then when we create the PDF, we almost already have an accessible PDF, or we have very little to do.

Now, I'm going to show you some recipes. And we're not going to go through these recipes today, but the [INAUDIBLE] is going to be available after. And I want to demonstrate to you that we have these recipes to share. So for instance, we've worked really hard to figure out how you can make a Microsoft Office file perfectly accessible in Office and then generate an accessible PDF file from it. As long as you meticulously follow this recipe we've laid out, this works for Word, this works for PowerPoint, this works for Excel. It works a lot better, by the way, with Office 2010 or later, because Microsoft's worked really hard to build accessibility features in since 2010.

If you were at my last webinar with 3Play, we announced the beta of this. Well, now we've released the Berman Accessibility Ribbon. So you can come to [DavidBerman.com/ribbon](http://DavidBerman.com/ribbon). We've created this ribbon. It's free. It's donationware. We're raising money for some good causes with it. But what we do is we take all the accessibility features in Word 2010 or 2013 or 2016 for Windows and put them in one ribbon so you can get to them quickly throughout your organization. So you can grab your copy.

Now, we also have a recipe to get from PowerPoint to PDF. We have a recipe to get from InDesign to PDF. We have a recipe to get from Illustrator to PDF, not that it's easy to make accessible Illustrator files. But we have a way, because sometimes people will put together small brochures and documents in PDF.

And LiveCycle Designer itself, I'm not sure how many of you are into this, but if you're into making truly interactive, powerful forms, there's nothing like LiveCycle Designer. The key is to make an accessible PDF from that, you have to be very, very careful. And here's the recipe for that.

So once we're equipped with all these recipes, for every WCAG 2.0 rule, we have a recipe for how to get that done. And so if we're looking through the lens of, let's say, making a Word document that's accessible, whether we're going to share it in Word or we're going to share it as a PDF later that started out as Word, we have a way to get that done.

So I'm going to give you a couple examples how that works. So for instance, for those of you who were at our last webinar, I walked through WCAG 2.0 1.1.1 with you, which is about alternative text, 1.2.1, which is about multimedia. But I thought since we're talking about documents today as much as websites, I'm going to grab onto 1.3.1, which is level A, so everyone's got to do it.

And when we break out info and relationships, we tend to break it out into the categories of table, markup, as well as page structures. So I'm just going to dabble in tables to give you a sense. When we look at a table design, first we actually have to think about how the table is organized. What goes on the x-axis? What goes on the y-axis? And so for that, that's a matter of good graphic design and information design.

But once we've established what our table is going to be like, then we have specific guidelines in HTML programming to follow in order to make a table accessible and making sure we actually even need a table as opposed to, let's say, a list. Now, in HTML, then, we concern ourselves with a recipe for making a data table versus making a layout table. Because although layout tables are frowned upon, we can make them accessible if the tables are simple grids.

However, we've also got a recipe for making a perfectly accessible data table in Word. Here it is. I'm not asking you to scribble this down. We'll share it with you later. But we have a recipe

for making data tables. And as long as we follow this precisely, we will get a fully accessible data table in Word.

And we have a recipe in PowerPoint and Excel, and we have a recipe in InDesign, and we have a recipe even in PDF. What I mean here is I'm saying the best practice is to start off with that source document, but you're going to have situations where someone is going to come to you and say, here's a PDF. I don't know where the source document is. It was created 20 years ago. But I need this PDF to be made accessible.

Now, that's not the best situation, but there's always a way. And so we always have a technique to start with a PDF that's not accessible and create a PDF that is accessible. It's just a matter of how much work we have to go through to do it.

Now, another example of a rule-- and this is the last rule I'm going to show you. I wanted to choose a rule which wasn't so nerdy, one that's more of a content rule, an editorial rule. It has to do it with color deficits. Because we have rules that for people who can see, we want to make sure we use color pairs that are perceivable by everyone.

For instance, if I take this picture of the CN Tower from Toronto, and I'm just going to remove all the color from it so you perceive it the way that 10% of men on the planet perceive it. I should say 10% of men have some level of color deficit. This is an extreme case. But you see how you can no longer tell the difference in the light between green and red. That's a problem. That's a safety issue.

Up here in Canada, we've actually solved that. Up here in Quebec, they designed a better traffic signal where you're not just using color. You're using the shape of the lamp and the number of lamps to discriminate. In fact, when I was in Massachusetts about six blocks from 3Play's office recently, I saw this crazy looking light that I'm amazed is even legal in America. This lamp says don't turn left. That's really dangerous. But to the color-blind person, it says turn left into oncoming traffic immediately. And that's a problem. But I digress.

When we look at WCAG, we've got two rules that have to do with how we use color. So one rule is about the language of color. And we have to make sure that we never use color alone to get an idea across. So if we say something like, fill out the red parts of the form, well, if you can't see at all, you won't know where the red parts of the form are. Or if you're color blind, you won't be able to tell the red part from the other part of the form. So we want to make sure that the instructions don't rely on color.



So I've got some examples here. If you want to sign up for Google Apps for Business, this form, on the left I'm showing it in the color that they expect people to see it in. On the right, I'm showing how it looks to someone who can't see color. And the problem is they tell you which fields are mandatory or which fields have failed just by saying, "Please complete the highlighted items." So that's a fail. That's a level A fail.

Or here's a document which tells you which version of Acrobat Pro to buy, but the problem is that these little circles-- I'm just going to use the arrow to point to them-- they're using color to differentiate the features. So someone who can't see color or someone who's got a black and white printout of this may not be able to tell which features to choose. And if they just used a different shape or words, it would have been clear to everyone.

The other rule we use for color is a rule called minimum contrast, and it makes sure that the foreground color and the background color exceed a certain minimum contrast. And even if you see all frequencies of light that many humans see, we have tools that allow you to measure this. So we've got a hard rule, and I've got examples here.

I, for instance, with the way my eyes work, I can't tell from this chart that shows what time the sound and light show is on in my own hometown in August. Apparently somewhere in here the date where the show starts at 9:30 versus 9:00 is delineated by color, but I can't tell, because they only used color. There's so many ways they could have got around this. They could have used words. They could have used patterns.

And we see these type of challenges. This is the website that tells me where to vote in our federal elections, and the color contrast is so poor it's hard to distinguish. Or this is a map which shows you where to vote in every state in America. But when you look at the map in grayscale, the different shades are so subtle that it's hard to map up the states with what time the polls close. And of course, to run a great democracy-- we've got enough problems with our democracies that we don't need to add to these type of problems.

The good news is we have some great tools. In fact, this is a tool I'm proud comes right out of Toronto. It's a tool which simulates what your website looks like. So your website's on the left, and then on the right, you can turn dials and say, show me what this looks like to someone who's maybe 65 years old. Show me what this looks like to someone with a certain flavor of color blindness. So you can perceive what it feels like to use your interface.

But as well, if you need hard numbers, we have tools like the Colour Contrast Analyzer. And there are many of these type of tools, but this is one of my favorites. It's a free tool made by an Australian, which is why they spell "colour" correctly. And it helps us measure. By simply using a pointer, we can point to the text color and the background color, and it will tell us whether the ratio is sufficient.

Now, the rule is that we need a ratio of at least 4.5 to 1 to pass this AA rule. And so it's showing me that this would be a pass. This contrast of this foreground color to this white is enough, but it would fail AAA. We're not talking about AAA today. And also, we have techniques.

Now, we can use this tool with a website. We can use it with a mobile browser. We can use it with a Word file, a PDF. That's why I like it, because it sits on top of everything and it's available for Mac and Windows.

So we can either fix the colors or we can build tools into our documents or our products that allow the users to change the colors. So you've all seen sites that have controls where you can turn the dials, or we even have controls within PowerPoint. You may not be aware of this. You can actually put an alternate color scheme built right into PowerPoint for people when they're using grayscale printers.

And that way, you don't have to change your color scheme at all. You just use this recipe on this slide and you can set up a grayscale version. And users who are color blind can just switch to that. Or if you want to print it out on a black and white printer, it works as well.

And another handy thing is if you have a PDF file that doesn't comply with the color contrast rules, you can instruct the users themselves to go into Options, turn the knob, and change what the colors look like in the PDF reader. We're allowed to seek out the easiest ways to get it done. We're not trying to make this difficult. We're trying to make it easy. And so you're allowed to be as creative as you want to find ways to make everything accessible.

There's, of course, a lot more to WCAG. But I want to assure you that if we walk through every level A rule and every AA rule, I can show you a recipe to get it done. At Carleton University, we did this throughout the organization. We figured out how to create videos and sessions so we could educate an entire community-- students, educators, administrators, with conferences, with videos, with a website completely built in WordPress that's accessible. We were able to create WCAG 2.0 compliance every step of the way where either it was neutral

for the mainstream user or an enhanced experience for everyone.

That's what I wanted to share with you. I've got a little bit more but I'm wondering if we should take a few questions before we get into my dramatic closing statements, Lily. What do you think?

**LILY BOND:** I think that was a fabulous presentation. Everyone has been sending in their praises via the questions. And there are a lot of questions here, so I agree that we should get right into them.

**DAVID BERMAN:** All right. So Tamara, my amazing producer here in Ottawa, is just putting the questions in front of me to make it easier for me to see them.

**LILY BOND:** Great. We've compiled them over here so I will ask them to you. We've organized them and that kind of thing.

**DAVID BERMAN:** That's helpful, too, especially for people who can't see them. They can hear them as well. Like me, I can't see them right now. I've got a temporary visual disability when it comes to webinar questions. Please go ahead, Lily.

**LILY BOND:** Great. So just before we get started, I wanted to mention that everyone who has been enjoying this webinar should look out for upcoming webinars on empowering YouTube for higher education, DIY workflows for captioning and transcription, and quick start to captioning, all of which are coming up this summer. You can register for those at [3playmedia.com/webinars](http://3playmedia.com/webinars).

So David, I'm going to start out with a question for you that says, "Isn't our website going to look ugly after it gets an accessibility makeover?"

**DAVID BERMAN:** Well, it doesn't have to be that way. I have seen cases where people have, very earnestly and with all the best intentions, without that much experience, gone and grabbed onto these WCAG 2.0 rules and tried to apply them. And indeed, they ended up with a website which was slower or not as dramatic or clunkier and not necessarily that accessible. Because they didn't believe that it was possible to create a website which was truly accessible without trade-offs. But it doesn't have to be that way.

You know, also, I'd say back in 1998 when we were first doing this with the federal government in Canada, yeah, actually, there were a lot of trade-offs, because we didn't have the tools. We didn't have the techniques. But now there's no reason. I can show great examples.

I'm thinking of the MCIE.org, the Maryland Center for Inclusive Education. This is a fantastic organization in Maryland. And they came to us. Their web team, they had never done accessibility before. But we assessed their site. We often do audits.

We did a gap analysis, we coached them through the differences, and the site ended up looking even more awesome than it began. It was a beautiful looking site to start off with. Now it's even better, and of course, it reaches everyone. Why wouldn't we want that? So it's totally doable, Lily.

**LILY BOND:**

Great. Thanks, David. There are a bunch of questions coming in here asking just whether or not this webinar will be available later on. I just want to reiterate that we are recording it and you will be able to access the recording with an interactive transcript as well as the slide deck by the end of the week. I'll send out an email with a link to that. And to those people who are looking for more comprehensive information, I suggest taking the handout that we have there with a coupon code to David's full-day presentation on the same topic.

So David, another question for you here. Does assistive technology reduce the need to make web content accessible?

**DAVID BERMAN:**

Well, it's more that assistive technology meets us. What we do is we create the content in a way that complies with the international standards. And the people who invent assistive technologies create technologies that assume that we've met those standards. So we meet them halfway. People are inventing new assistive technologies all the time. And so the more assistive technologies that are invented and the better they are, the more brilliantly our efforts to make our products accessible is going to be manifested for more and more people.

So you could argue some of the assistive technologies are so clever they actually overcome some of the shortcomings. So for instance, even though your site isn't accessible, the JAWS screen reader is pretty clever at sometimes helping people push through it anyhow. But the paradigm we want to work with here is we need to have sites that comply, that meet or exceed an international standard. And then everyone knows they'll be able to plug in every assistive technology and have a delightful experience. That's what we want for them and that's what they want for themselves.

**LILY BOND:**

Thanks, David. There are a couple of questions here about video captioning in YouTube, just wondering that YouTube automatic captions are pretty incorrect, and if you have advice for the

best way to work with this issue or tools to use for captioning.

**DAVID BERMAN:** Yes. It's absolutely true that YouTube has an amazing built-in engine that analyzes the speech in a video. And assuming the speech is fairly straightforward, the speech is clear and there's only one speaker, it's very good at giving you a first draft. We have very funny examples of automatic captioning for some of our clients where there were actually swear words and things accidentally in them because YouTube got it wrong. But it's way better than nothing. But the captions that YouTube does are not at all professional-level quality captions, but they could save you some time.

So essentially, we have two approaches we recommend to people if they want to do captioning. If you really want to try to roll your own captions, and that's a good thing to get to know just to understand captioning, I've actually got a blog post where I go into great detail as to how you can work with YouTube's captioning engine and learn how to make better captions that are properly paced and properly broken out. There's a lot of advanced topics, like how do you deal with multiple speakers?

But the other way, and it's what we've moved over to, is we hire 3Play. [INAUDIBLE] it sounds like a setup, but it's not. 3Play does the best captioning we've ever seen, and it's so inexpensive that we might as well just send it to 3Play. They turn around captions to us usually in under 24 hours. It costs just a few dollars per minute and it really is cheaper than anything. And the quality of captions is better than anything we were ever doing ourselves. So I can see situations where you may want to caption your own stuff, but outsourcing it is often the right answer as well.

So YouTube is a good step in the right direction, but they don't comply with international standards for captioning. But they're way better than nothing, and especially because they do real-time translation. That's pretty awesome, too, because you're probably not going to caption your video in 28 languages, but YouTube will do it for you automatically.

**LILY BOND:** Thanks, David. Another question about captioning. Does the ADA require universities to make all videos, whether YouTube or library materials, captioned?

**DAVID BERMAN:** I'm pausing before I answer that because it's a bit of a gray area still in terms of deciding which aspects of-- when you're talking about a higher university or college, there's interpretations based on what we consider our public spaces. Is every book in the library public? Is every classroom a public space? And to what degree do we need to conform with

the various rules in WCAG 2.0, which there's about six or seven rules in WCAG 2.0 regarding making video accessible. And that's not just about captioning. It's also about having descriptive text transcripts and audio descriptions, descriptive video it's sometimes called in some countries.

And there's also the challenge that some of these rules are level A and some of them are AA. And in some jurisdictions, there have been exemptions for live versus recorded. So imagine if, let's say, you took this event. To caption it live is trickier, especially to caption it perfectly, is trickier to do it live than it is to do it later on when you have, let's say, a week to get the captions just right and then put them up on the web.

So all that to say is that it's a neither yes nor no answer. But if you want to go deep on that, I'll talk to you offline about it. Because we have to know the details of what your situation precisely is and how soon you need to get it done.

**LILY BOND:** Thanks, David. Another question here. When using Microsoft Word Save As PDF, does it save to the PDF/UA standard?

**DAVID BERMAN:** Probably not. That is to say if you've made no effort to make your Word document accessible, then the resulting PDF doesn't have a hope of complying with PDF/UA. However, if you follow our techniques to comply with all the WCAG 2.0 rules or success criteria, when you build your Word file, then you don't just save as PDF. You carefully follow that recipe I showed you earlier. Because there's four different ways to create a PDF out of Word, and there's all kinds of check boxes and radio buttons to select as well.

So we ask that first you build your file accessibly in Word, following all the rules. If it's a very simple document, that could take all of minutes. But if it's a very complex Word document, it could take hours and hours of effort. Once you've got an accessible Word file, you then carefully follow our recipe to how to save to PDF.

And then at that point, you may indeed have a PDF/UA compliant file, but chances are you need to do a few more things in Acrobat Pro to finish the work, or maybe a lot of things. And then finally, the PDF/UA flag finally has to be flipped. So one of the PDF/UA requirements is actually flip the flag that says, I'm a PDF/UA compliant file. So that will never happen when you save as a PDF. So you at least have to flip that flag. I know that's a long answer, but that's the reality.

The key thing to take away is this. If you do 99% of the accessibility in the Word file, and then you only have 1% of stuff left to do with Acrobat, or there's other third-party tools as well that are even better for this sometimes, then that's the way you want to do it. Because let's say a week later, someone has a new version of that Word file.

Well, if you're doing all your accessibility in PDF, that is to say, you make no effort at all to make your Word file accessible and then you save it as PDF. And you hand it to someone who says, now I have to spend, say, three full days fixing your PDF file to make it accessible using Acrobat Pro. Then next week, you come back with a new version of the Word file, they've got to do all their work again. They've got another three days of work to do. But if you packed all that accessibility into the Word file, then you only have that 1% of stuff, or maybe 5% of stuff left to do in Acrobat. So it's a much more sustainable approach.

And if that doesn't convince you, there's a third reason. Because when we create documents, we want everyone to be able to not just read them or perceive them. We want them be able to be part of the creation of the document. So if we want to allow people who are living with a visual challenge or living with a mobility challenge to be able to be part of the editorial team that creates that Word file or that PowerPoint, then let's build the accessibility so that, as part of the editorial group, they can work with the file right from the get-go.

So when we put a photo in a Word file, we add the alternative text then, rather than leave it for later for someone to hunt down what should the alternative text be? And that way someone who can't see the photo can hear what's in the photo. I know that's a long answer, but I thought all those principles were worth getting on the table.

**LILY BOND:** Thanks, David. I think we have time for two more questions.

**DAVID BERMAN:** All right. I'll stick around as long as you want, Lily.

**LILY BOND:** Great. There's just a lot left and I think maybe it makes sense to reach out offline about some of these responses.

**DAVID BERMAN:** Absolutely.

**LILY BOND:** But for now, let's do a couple more. Someone is asking if you have workflows or recipes for making content management systems like WordPress or e-learning authoring applications like Articulate, Adobe Camtasia, Lectora, if you have recipes for making that type of content accessible as well.

**DAVID BERMAN:** Yeah, so we do. I feel like I'm sounding like a commercial for our own services. But the reality is the public courses we do are generalist, but we also do on-site courses for specific organizations more often than we do public ones. We have a course on nothing but accessible e-learning.

Or we were just delivering a course in Oman last month where we were breaking down every major CMS there is on the planet and comparing and contrasting techniques for creating accessible experiences, not just with what comes out of that CMS from the audience perspective. We're also thinking of, does the CMS have an interface which makes it easy for a fully-abled person to pack accessibility into their content? And does it have an interface that allows someone who lives with a substantial disability to also participate in authoring?

So when we're looking at CMS, there's actually all three of these lenses we're looking through. Is the authoring accessible? Does the authoring allow people to build accessibility in? And as well as, does it result in experience for the audience that's accessible?

**LILY BOND:** Thanks, David.

**DAVID BERMAN:** And then you kind of drifted off into a few other products there which went beyond CMS, and that's why I was saying whether we're talking about creating distance events like this one in an accessible way. We also have a course on that. We have a course on nothing but PDF. We have a course on nothing but Word. We have a course on nothing but web.

What we do is we customize it for each group, depending on what they have. So if you're already in WordPress, we're going to work with you in WordPress. But if you're thinking about choosing your next CMS, we can do consulting with you to help you make that big decision. And of course, that decision is going to be driven by a lot more than accessibility, but accessibility gets a vote, if not a veto.

**LILY BOND:** Thanks. So as a final question, I'll ask something that I think a lot of people are curious about, which is that if you really do not have the resources or staff to perform inventories or to perform these accessibility recipes, would you recommend that these institutions never scale up or avoid media altogether, rather than making inaccessible content?

**DAVID BERMAN:** Well, that's a pretty dark scenario. Because the reality is that, just as an add-on to before, if you don't have the budget to get trained, we have \$97 manuals which cover all of these things.



This is all stuff that anyone who's sophisticated enough to create content and develop websites or documents certainly can learn these techniques.

The thing is that when you go deep with these techniques, when you change how you roll, it actually reduces your costs. So rather than thinking, we can't afford to be accessible, I'm arguing you can't afford not to be accessible, whether it's because of the lost opportunity of missing market reach or not being able to attract students. Whatever it is you're selling, you're selling it to fewer people or providing a lesser user experience for them.

So it's actually going to cost you on the revenue side. But as well, with very few exceptions, learning how to comply with WCAG 2.0 actually drives down development costs. Because it forces better systems on how you get things done. So with only two rules I can think of, these are either revenue neutral or actually reduce the cost of getting it done.

So I guess I'm rejecting the scenario where someone says, we can't afford to do this. I'm arguing, although it sounds kind of cliché, that you can't afford not to do this, especially not even touching the regulatory challenge where people are going to say, by the way, you could have a lawsuit on your hands if you don't do this stuff, not to mention how your conscience feels about it. Am I misinterpreting the question when they talk about scaling up or scaling down when I say that?

**LILY BOND:** No, no. I think that makes sense, and it's a great response.

**DAVID BERMAN:** I didn't mean to sound harsh. Because this is a good news story. Apologies if I-- we Canadians, we must apologize for sounding harsh. I'm like to say I'm sorry.

**LILY BOND:** Well, I don't think you were sounding harsh.

**DAVID BERMAN:** All right, very well.

**LILY BOND:** Great. Well, there are a lot more questions here, and we will look at those and reach out separately from this. But thank you so much, David, for just a fabulous presentation. Everyone's really loved it.

**DAVID BERMAN:** Lily, thank you so much for giving us the chance to share this knowledge. Obviously, we have a passion for it. We're talking about doing another webinar if people are interested. And maybe we could get people to put their hands up on this.

Because this is a very idealistic presentation that I gave today, but we were thinking about doing a webinar that's just about quality assurance tools, what tools we have, a bucket of tools that are free or next to nothing in terms of licensing costs, that allow you to test your websites or automate making things accessible. We were thinking maybe a webinar on that, nothing but practical tools on how to do quality assurance and testing to make sure our documents and our websites are accessible. I'm wondering if people are interested in that.

We'd certainly be eager to do that at some point with you as well, Lily. You're always a delight to work with. And I wanted to thank Emily, too, and of course Tamara here and all my team here. [INAUDIBLE] You don't see them here, but Dan and Stephen and Khadija, who helped put this together today. And Tole for inviting us in the first place.

**LILY BOND:** Well, thank you, David.

**DAVID BERMAN:** And mostly everyone for showing up on such short notice. So thank you, everyone.

**LILY BOND:** Absolutely. And just in response to that webinar proposition, we have a lot of positive responses, including, "Yes, do it," and, "Yes, please." So I think that's a definite go.

**DAVID BERMAN:** Yes, sorry.

**LILY BOND:** Well, thank you everyone for attending. I want to reiterate that we will be sending out an email with a link to view this shortly. And I hope that everyone has a fabulous rest of the day.