FEMALE VOICE: This conference will now be recorded.

LAURIANN HEBB: Hi there. Welcome to our presentation. Wendy and I are very excited to participate in a Future Date conference. We first presented this information at Pac Rim in Hawaii, but at that time, a lot of attendees were already impacted by the COVID situation and were unable to attend. So we're very excited that we're able to present this again and reach more people.

My name is Lauriann Hebb. I'm a principle US researcher at Log Me In. My meeting focus on the meeting tool Go To Meeting. But I've been in quant research for almost 15 years, specializing in survey methodology and identifying the right metrics to use at the right time.

WENDY FOX: Hey, everyone. Also super excited to be part of this. It's a first for me. My name's Wendy Fox. I'm a senior product designer at Log Me In. I mostly work at the Go To Suite products, for example, Go To meeting, GoToWebinar, Go To Training. My background is in research, actually, so I did my PhD in this and worked a while at universities, then added communication design. And now I'm happy to work both as a designer and researcher and leading our accessibility and inclusion efforts at Log Me In.

Our talk today is called Red Is Not A Signal Color to Me. We're going illustrate how we started pretty much from scratch with user research and how we established an inclusive design approach for our product building processes at Log Me In.

So as I said, we pretty much started from scratch. This doesn't mean that no one was an expert or no one knew about accessibility or inclusion, but there was no common strategy for all of our company or even like one product. So we really had to understand where do we start, and how do we get to a place where we build accessible, inclusive products.

And we found great inspiration in Microsoft's Inclusive Toolkit. So the illustration you see on the left has user centered in the middle and then several rings around it saying Mindset, Method, Tools, and Inclusive, and this is where we started, as well. We started with our users.

We made it our priority to listen and learn, so we are able to build the empathy in our company, develop the right methods that work for us, find the tools that we can recommend to our designers, product people, engineers, and find the right way that allows us to build better products that are inclusive and accessible. And Lauriann will share our first stab in how we approach listening and understanding to our users.

LAURIANN HEBB: Thanks, Wendy. We took a multi-method approach and really wanted to investigate, both quantitatively and qualitatively, how our users are interacting with our meeting tools as well as other software. So for the quantitative study, we got a sample of US Americans who self-reportedly had some sort of disability. And we recruited them via an online panel between July and August of 2019.

Our two main screeners is that they had to regularly use meeting tools, and the disability that they reported that they had had to also impact their meeting tool use. We had over 1,200 total participants, and they're broken down with the following disabilities. 662 indicated that they were vision impaired, and this was a mixture of blind, color blind, and low vision.

Then we had 429 who indicated that they had some level of hearing impairment. This could have been completely deaf and an ESL speaker, or hard of hearing English speaker. And then finally, we had 166 who indicated that they were motor impaired, and they told us that some of these examples were arthritis, they were paralyzed, they had chronic pain, or MS.

For the qualitative study where we had one-on-one interviews with them, this was a recruitment of both US Americans and Germany-- Germans who were recruited via respondent or directly because we may have known them. We had a total of nine participants here.

Their names were Alex, who was completely blind, Joshua, who was both completely blind and hard of hearing, Yvonne, who had low vision, Trina, low vision and palsy, Hartmut, who was red/green colorblind, James, color blind and low vision, Jesada, who was completely deaf and an ASL speaker, Sean, who was also completely deaf and an ASL speaker, and then Eberhard, who has ALS and is fully paralyzed.

We had three key findings from both of the qualitative and quantitative research. So looking at both of the results together, what we found was that users with less severe disabilities actually find meeting tools more difficult to use compared to those with more severe disabilities. We also found that users prefer online meeting tools to be accessible out of the box. And then finally, if users have frustrating experiences due to the lack of accessibility, this can then cause them to stop using the product.

Our first finding users with less severe disabilities find meeting tools more difficult to use. We actually thought this was a pretty interesting finding as it's not what we would have expected.

What we found was that users with low vision, not blind, or low hearing, not deaf, score meeting tools as the hardest to use. Looking at the statement, whichever meeting tool that they had, they rated that on the statement this meeting tool is easy to use.

It was on a seven-point scale where 1 was strongly disagree and 7 was strongly agree. And below that, we have the means broken out for each of the types of self-reported disabilities. And what we found was that those with low vision and those who were hard of hearing are rating it less easier to use, and this was a significant difference when you look at those who are blind, color blind, or fully deaf. So they are definitely indicating that it's not as easy to use as those who have more severe disabilities.

So we started investigating some of the data to understand why this might be. And one of the things that we found that support this is that users with less severe disabilities are actually less aware of the native assistive options in their operating systems. So with the question, are you aware of the assistive options in the Mac/Windows operating system, on the left hand side we have the hearing disabilities broken out.

So those who are deaf, 83% of them say yes and they use them, whereas only 65% of those who are hard of hearing said that they use them, and 14% actually indicated that they weren't aware of those options The breakdowns aren't as strong of a pattern for those who are vision impaired with about the same proportion of people indicating that they use them, but definitely a much higher proportion of people with low vision indicating that they are not aware of those at 13%.

So one of the people that we interviewed indicate that they don't aware-- they're not aware of these assistive options, and they must figure out alternatives. So here's a clip from one of our interviewees.

TRINA: Guess it's been so many years of doing this, so you don't really know what is working and what's not. If there was a solution out there to make it easier for me, I don't even know if I would understand what could be easier, because I am not aware of different options. Does that makes sense? I don't really know what choices I have or what's good. I know it's embarrassing. I know what doesn't work, but I don't really know what could be better or what else is out there to be better.

LAURIANN HEBB: So two examples of where Trina mentioned that she just doesn't even know what's available. She doesn't know what's out there. And she has low vision, degenerative vision as well so just

talking about that a little bit.

And then what we also found is that these less severe disabilities aren't visible, so it's not something that upon meeting somebody you can instantly know that they have a disability. They may not tell their colleagues that they have this disability, and they also at times feel as though this disability might be embarrassing to them. So here are Trina again, as well as Yvonne talking a little bit about where some of these problems come in into their lives.

YVONNE: My experience is it's easy to get in, but then because there's, like, 20 others in a classroom, everyone starts using the chat bot. That's where it's challenging for me. It's like it's really small print on a laptop, so it's challenging to be face to face in the meetings and be able to read it, because I usually have to really bring my head in closely. So for me the writing, I do have a magnifying feature on my computer, but for some reason when I open it, it makes it challenging maneuvering around. So I just wing it and don't use it because it just interferes a lot with the videos.

I do go on to conference calls on my phone, and I find that a whole lot easier. But generally I will take myself off from live video feeds, so I can read the messages and respond. It's just a little well comfortable.

TRINA: I think in general it's just kind of embarrassing when I have to ask someone to zoom in, or if I'm trying to do a joint presentation. And so we're both trying to read off different slides, and then I can't read it or I can't participate the way that I want to because I don't have enough control over what I can see. I can't say that my employer has been super accommodating about anything, but I'm also a little embarrassed to ask her for help, if that makes sense.

LAURIANN HEBB: So on the flip side of those with less severe disabilities kind of not being aware of what's out there for them or indicating some level of embarrassment, having to ask for help, those with more severe disabilities usually have somebody helping them. They might have a colleague or a translator assisting them. So here's two examples of some of our interviewees who are both completely deaf, indicating that they always have an interpreter with them.

PRESENTER: Every meeting that I have is different. Like meetings about IT, technology, things, I'm not usually involved. Typically we'll go ahead and send an email and chat email so that everyone's on the same page. If I am involved in a meeting such as that, I will always have an interpreter available.

So they'll have a note taker also on the computer and word processing. I have an interpreter with me all day every day, interpreting in meetings and discussions. I have other people take notes or log our discussions for me, so that I can focus on the task at hand.

LAURIANN HEBB: So again, just two examples on how their experiences are even different for those who with more severe disabilities, against those with less severe. Our second finding was that users prefer their online meeting tools to be out of the box accessible, right? When they get them, they just need to work for them.

Somebody without any kind of disabilities would expect that the same thing. There's no differences in what they expect. So we asked the question, how important is accessibility to you when using an online meeting tool? And almost everybody unanimously said they either want it out-of-the-box accessible, or it needs to be compatible with assistive technology.

And the two that I've highlighted up at the top for those who are blind and deaf, you can see that 86% of users are saying out-of-the-box accessible. It definitely wants it to be ready to go, out-of-the-box, I need to be able to use it. Whereas those with less severe disabilities are more likely to say, in addition to out-of-the-box accessible, if it's compatible with assistive technology, that's also all right for them and more acceptable.

We also found that accessibility really isn't a one size fits all. You can't just ask for people with one type of disability the types of features and things that they need, because we found that features needed differ by the type of impairment. So when we look at the feature requests broken out by the type of self-reported impairment that they have, some of the things that hearing impairment people would have liked to have seen were increased volume, noise-canceling headphones, subtitles, easy-to-read text, transcripts, chat features, and even an ASL interpreter.

Those with vision impairment ask for features such as increased or high contrast mode, information not being conveyed through color. They need adjustable text sizes. They need the ability to zoom. They would like some Braille output, full keyboard access, or even screen reader support.

And then the motor impairment features that were requested were voice control or voice recognition, gesture controls or translations, and freezing and capturing screens. So again, when thinking about designing, you can't just focus on people with one type of impairment. You have to look at everybody.

Our third finding was that frustrating experiences due to the lack of accessibility can cause discontinued use. So what we found here is that these accessibility shortcomings can complicate users' lives, and they might even turn them away. 38% of our respondents from the quantitative survey stopped using software due to the lack of accessibility.

Some of the quotes were, "Yes, I hate being frustrated by it or having to have another person assist me." "I have quit some app because it was so difficult to understand my way around it." 6% indicated that they failed entire work tasks. One quote was, "We had to cancel a meeting because I was unable to use the software."

What we also found is that over half of those who cited having a frustrating experience actually put the fault on themselves and not actually on the tool. So when we look at the question, please describe the most frustrating experience you have had with inaccessible software, almost 3/4 of them said that there was some kind of software that had shortcomings.

And when we broke that out, 39% put the blame on themselves of not being able to use the tool, and only 35% put it on the tool. So more people were blaming saying it was because of their incompetencies that they couldn't use the tool.

Some of the quotes from these are, "Being left out of knowing important information being discussed in a meeting." "Due to my efficiency, I stopped using a lot of software." This is from a director who was legally blind. "I have to get a coworker to set it up for me. It's frustrating because it makes me feel incompetent."

A banking manager with low vision. "Not being able to use the software because of the lack of accessibility features such as voice control." A database admin with low vision. "When the buttons are all shaped the same but are different colors." A company owner who is colorblind.

When we look at those who have positive experiences, we found that the light comes from independence and success. We asked users also to please describe the best experience you have had with accessible software. And the three main themes that came out of this was that it's easy to use, I'm successful in the task that I was trying to complete, and they appreciated it because it was accessible.

Some of the quotes from those types of responses. "I was able to participate at everyone's level." An engineer with hearing impairment. "Being accepted." An IT manager with hearing

impairment. "There are no embarrassing scenarios." A broker with hearing impairment. "Feeling empowered." A retail specialist with vision and motor impairment.

So some of the takeaway we have from the surveys and the interviews is that we need to design technology so that it is easily accessible to all levels of impairment. We know that inaccessible technology can cause users to discontinue, and not everyone is aware of the assistive technology options. Also, accessible technology brings users of all different kinds together. It makes them feel as though they are part of the larger group.

So from a research in general, what we want to do and what we plan to do in the future, is we need to ensure that all of our research actually represents diverse users. We need to build this pool of users who we can ask to be references and points of contact. And we need to allow our product decisions to consider all users' needs, their expectations, their behaviors, and their motivations. And now I will pass it over to Wendy to talk about the design process.

WENDY FOX: Thanks so much. So pretty much what we learned and we're pretty much on the same level now, so I want to share how you can go on, what's the next step. So you did the learning and understanding and you know what are the expectations and needs. Of course, we also learned that accessibility is not an on top teacher. It's something that scales for all kind of situations on all our users.

And usually accessibility is not really a feature itself. It is just common regular usability taking all our users into account. So our next step and goal and also recommendation for everyone else doing this process is building the mindset at the company.

Of course, the first step is to share these learnings and readouts. Do the research, understand your users specific to the tools and products you build, and do the readouts. Present your learnings and answer questions. Be really open and give the space. Ideally, do it in person or at least live. Example, when you do it remotely. And do it repeatedly. Like once it's not really enough. Do this again and again.

Do it per office or per team. Make it specific to the function or teams you're talking to, and make it really easy and accessible, and start from zero in sharing all these learnings, and build this kind of empathy.

So something we learned works really well is creating shareable insights based on the research. So for example, here we have Alex, who was one of our interviewees. He's a

teacher who is totally blind and uses Skype to teach online. One of his quotes was, "I have a hard time with the whiteboard feature and with polls." So we learned that even though Skype's successful for him in general, there are some features that are not just designed in a way he can use them.

And then we had four major learnings, especially for our engineers. One was that keyboard access and shortcuts are very important for him to navigate and operate the tool. Then we also learned that the main screen reader he uses on desktop are JAWS and NVDA, which allows our testing engineers to test for these specific tools and try their products with JAWS or NVDA.

Then we also learned that he's an iPhone user and he uses voiceover and tech talk to operate it. Which is interesting for our engineers working on our mobile apps. And then an additional thing that was just super interesting to learn is that, even though he does use artificial voices, especially for speed and efficiency and when he's working, he does prefer natural voices for entertainment. For example, when he is listening to an audio book. So this was a really interesting way for us to learn how to make something more individual and add an interesting design feature to auditive content.

And I want to share one of the snippets that we share with our product, our teams that work on our products. For example, he is shown sharing on how his perspective, when using a meeting tool, differs from, for example, you or my perspective.

PRESENTER 2: OK, so you focus on the presenter and you see what's being presented, obviously. And you're listening at the same time. So your focus is on the audio and making sure that it matches with what's being presented, right? So you have a dual focus on hearing what's being said and seeing what's being said.

And deaf people always need to see the presenter, and if the presenter is not signing, then I will look to the interpreter. And just to make sure-- and I'd have to kind of quickly go back to also what's being shown. We have to wait, right? There is a lot of, like, indication.

And a hearing person can also read and listen at the same time, and then have comprehension, whereas as a deaf person, we have one or two or maybe three seconds of a delay because of translation, because of the interpreter, because of sign language, and then we understand the signing, and we have to find what it is that's being presented.

So my focus, and it takes kind of, you know, chameleon eyes sometimes. I mean, that's a very different experience than hearing person, who can focus on seeing something and listening to it at the same time. And so deaf people don't see several things at the same time. It's hard.

WENDY FOX: So this is a perfect example for our designers and engineers to understand how user experience differs a lot when using online meeting tools. Another one I went to shows is going back to what Lauriann shared with us, that we learned that more invisible disabilities are less obvious, obviously. So we wanted to share with our colleagues to be more aware of all these kinds of different experiences. And here we have our head of localization at Log Me In sharing, his experience on being red color blind.

PRESENTER 3: Yes, but mainly our conception of that PowerPoint slides or Excel sheets when people start to color code, recognize colors sometimes and indicate statuses. And that is really depending on which tone you use, or whether they are adjacent to each other or not. Sometimes I need to distinguish whether it's a darker green, or if it's another color.

And I know a lot of people tell me, hey, why don't you see that red picture, because red is a signal color? But that might be an interesting thing. For me red is not a signal color. It's just like any other one, whereas others tell me, usually it's something red that it sticks out. In a location.

WENDY FOX: So the important step in building the mindset and building empathy is that employees realize the effort and impact of building inclusive products. So this is a quote that I really liked of one of our readouts was, "I learned how big an effort true accessibility is and how many people, both with and without disabilities can benefit from inclusive design. Also how inclusive design done well is actually the best, most intuitive, and user-friendly design for software products and UI."

Another thing that I can recommend doing is empathy exercises. We are aware from feedback from other teams and companies that it does not work with every team, but for us the great thing is asking our engineers to experience our products with a different kind of set of abilities. It does help them to understand how to build better products.

So we do these kind of empathy exercises where we ask them to use our product with no or reduced sight, to just use the keyboard, or trying to disable sound while being in an online meeting. And then we can also reduce colors so they can understand what might not be working for someone with color blindness.

One of the feedbacks we got after empathy sessions was, "I was surprised how challenging it is to use products with accessibility features." So we had this instant learning, that even though there is accessibility features, it might still be challenging to use them. And we have this strong motivation to build products out-of-the-box accessible.

So another recommendation we have is inviting people with disabilities to share their experiences at your office. There are two groups that can easily share the experience with our products. One is our users, of course. But then also experts that can educate your experts. So in this picture, you can see Joshua who's blind and hard of hearing. And he's surrounded by our engineers, and they're listening to him, not only showing how he's using his phone and his computer and Braille keyboard, but also talking about the mobile app that we have, and him using it and giving direct feedback on how to improve the code, as he is a coding expert himself.

So we have this fantastic situation where he cannot only give feedback what does work or doesn't work, but he can-- our designs to make it more accessible and inclusive. This way we were able to correct wrong assumptions.

One of the feedback of our engineers was, "I was surprised he wants no special treatment, but surf the web as normal as possible." And this ties back in with a request to build tools out-of-the-box accessible. Not just put a high contrast mode on top and then don't care about the contrast of the out-of-the-box tool. So this was also really interesting learning and great success.

With building the right mindset, we can also motivate employees to design accessible products. One of our designers said, "I was surprised how fast he can learn how to use a new app or website if it is well designed for accessibility." So also underestimating our users is something that should not happen. And is easily like changed in the mindset when you see someone operate a well-designed website or app.

And then the most important part, and I think one of my favorite quotes, shows how we can build responsibility. One of our engineers, after talking to Joshua said, "'Actually, I learned a lot, and I was super surprised how he used his laptop and phone as a blind person." "And as an Android developer, I feel responsible for providing them better software to stay connected." So we build the responsibility in improving our tools and making them accessible for everyone.

And then I think the most obvious learning, as you also could see from us having people like Joshua be part of our team, is employing experts with disabilities. You have that favorite quote of, "Nothing about us without us." And it just makes life so much easier and it is so logical to not just have a user test your product, but have a testing engineer that does the testing and can directly share feedback and improvements. So having people with a variety of disabilities and user experiences on your team makes it so much easier to build inclusive and accessible products.

Our next step was to identifying the right methods. The approach to inclusive design that we can recommend is finding a minimum level of accessibility that you want to reach. For us, we decided to be combined with WCAG AA, that we want to educate our employees and colleagues, and establish inclusive mindsets and practices. But then also want to empower our users by introducing new and additional features in our products.

The steps to get there is making sure your colleagues and employees are accessibility experts, having clear design principles that include accessibility and inclusion, and having a clear process for your product teams.

Our accessibility training is now focused on spreading and motivating awareness, developing and maintaining knowledge, and also sharing knowledge, and a common knowledge base across the entire company, ensuring compliance and also the awareness of what does compliance mean, and then enabling our colleagues on discovering opportunities by being aware of how these opportunities might actually look like.

For our designers, we have the main design principle of accessibility that is defined as enabling customization, communicating clearly, and designing unambiguously, and being proactive. Here's some examples of what that means.

Concerning customization, you will never to be able to build the one tool that fits for everyone. So you have to enable customization so everyone can make it-- make the interface look in a way they can use it and interact with it.

One example is our product GoToWebinar, where you can use a high contrast mode or a dark mode. So when you change to dark mode, the usually white and blue interface changes to dark grays and black, which makes it usually much more easy to interact with for people with low vision.

Then we want to make sure we are communicating clearly. This is not only the text, content, and it's kind of UX writing that we deliver, but also, as you can see in the screenshot from the IBM Carbon Design System, this also applies to code and labeling elements clearly. So for example, a screen reader knows exactly what kind of element it is interacting with.

Design unambiguously is, of course, making clear whatever you use, being it icons, just use it for the same thing, having a constant navigation. But also we include this, for example, with color contrast. So we improved our meeting controls in GoToMeeting. First we had an insufficient contrast of 1.85 to 1, and we changed our color palette, and now we can achieve contrast of 4.5 to 1 for all our core elements and main controls.

For being proactive, even though we have some nice examples in our most recent releases now as well, I want to share this example from Slack, where once you start navigating with a keyboard, there will be a pop-up window offering some of the most common shortcuts and asking you if you want to see more shortcuts. So it realizes you are using keyboard only, and gives you a few recommendations on making this more efficient and fun.

Here's another nice example from starbucks.com, where once you start typing through the website and communicating that you're not using a mouse, you will see that in the top right area there will be a previously hidden button saying, Skip to Main Content. So it's really nice to allow users to not having to tab through an entire menu or navigation when they already know they might directly want to go to the main content. So you can make it more smoother and easy for them to access this area.

Concerning the creation process. I think that's pretty specific for each team and company. But be aware that there are two areas where you can improve. First you have to be aware of what's your status quo and have a clear list of backlog of what you want to fix and prioritize it. But then the more important part is that everything you've built and everything you will touch in the future, make sure to be based on the level of accessibility inclusion that you want as a standard for your products.

So finding the right tools, I think, goes hand-in-hand with finding the right process. I recommend being aware of accessibility tools that your users use. We learned from Alex, for example, that he's using NVDA and JAWS. We learned from others what they use to use an iPhone or Android. We learned about VoiceOver, Tech-Talk, and TalkBack.

So be aware of what tools are out there, including also stuff like Braille keyboards or eye

tracking. And include it in your testing. Then of course there's a lot of tools that help you building products. As a designer, for example, there are plugins like Stark for Sketch that helps me check color contrasts, be aware of color blindness, and checking my designs and gray scale. And of course making sure the contrast is all right.

So there's a lot of tools that can help designers and engineers to be aware of accessibility and inclusion and have it be part of their process when building something. And then there's auditing tools. Similar to what I just mentioned with the Sketch plugin, but there's also tools like Chrome plugins, Accessibility Insights, for example, or Lighthouse, and eslint that can help you to go through code or designs and get feedback on whether you missed anything or there's any areas of improvement.

For us, this is the package that allows us to build better products. So we started with our users. We listen, learn, understand, and based on that, we're focusing on building the empathy within our company and educate our colleagues and employees, and make sure they become accessibility experts themselves. Together with our employees, we are building the methods and recommending tools that enable us to build better products.

Inclusive design obviously benefits all of our users. These are the three main takeaways that we have. Understand who your users are. Do not base decisions and priorities on subjective assumptions and expectations. Look at the data and speak to your real users. Then build empathy across all functions. This enables you to understand all your users and establish an inclusive mindset throughout your company.

Finally, empower your employees to take action. Clear priorities, tools, and processes allow them to take over responsibility and build inclusive products. And that's pretty-- Please reach out if you have any further questions. Super excited, as Lauriann already said, to be here and be part of this conference. That's it for me. Lauriann, did you want to add anything?

LAURIANN HEBB: No, I think that covers it. Again, I just want to thank everybody for listening to our talk. And again, just to reiterate what Wendy said, if you have any questions or comments just feel free to connect with us and ask us some questions. Thank you.

WENDY FOX: Awesome. Thanks so much.