# Podcast Transcript: Apple, Innovation and Accessibility

**Robin Christopherson:** Welcome to another episode of The AbilityNet Podcast. Disability. Technology. Inclusion. I'm your host Robin Christopherson, Head of Digital Inclusion at AbilityNet. A pioneering UK charity with a mission to make a digital world accessible to all. Join me on this series to revisit key themes from TechShare Pro 2022. A place where accessibility professionals and allies gather once a year to share and learn together. You can download a transcript of this episode from www.abilitynet.org.uk/podcast. So, sit back, grab your favourite beverage and let's get started.

Guys, well, it's another AbilityNet podcast welcome. Marks here. Marks here again this week.

**Mark Walker:** Hi Robin

**Robin Christopherson:** How's it going?

**Mark Walker:** I'm good, thank you.

**Robin Christopherson:** Great so, Mark, this was one of yours, wasn't it? You were talking to Sarah Herrlinger of Apple. So, this was a really popular session. Do you want to give us a bit of an intro?

**Mark Walker:** Yes, well, um, Sarah has actually been at TechShare Pro for several years and she's a good friend of AbilityNet. I speak to, you know, different times during the year. What's amazing about having Sarah come into TechShare Pro is that she always talks more broadly about where Apple's sort of taking accessibility and the lessons they're learning. And she's the Senior Director of Global Accessibility Policy and Initiatives at Apple. So, she's, she's at the top of the tree and reporting into Tim Cook. You know, this is this is an important position in terms of accessibility, really, the community. And what I think you'll find in this chat is how the breadth of what Apple does around accessibility, which we largely think of as being best practice, some of the stuff they do is best of breed. But it shows how deeply they work on that, and how they bring that together across a number of different areas. And yeah, I mean, it's always lovely talking to her. And in particular, looking back on TechShare Pro, you know, this is a real highlight for me, and in hearing how a massive company like Apple is sort of putting that into the world that AbilityNet inhabits around disability and inclusion and accessibility. So very nice connection between the two, I think.

**Robin Christopherson:** Oh, fantastic. I can't wait. So, without further ado, let us listen to this brilliant session. And we will be back afterwards.

**Mark Walker:** Hello, everybody. Welcome back. We had a great start there what a fantastic opening hour of content, going from the CEOs through to helping individual people with disabilities in their own homes, and connect and live independent lives. I'm really pleased to say I've got Sarah here from Apple. Hi, Sarah, how you doing?

**Sarah Herrlinger:** I'm great. Thanks for having me.

**Mark Walker:** This is your third TechShare Pro as well. So, I think you might get special badge at some point. Thank you so much for joining us. We're going to talk a bit about how Apple approaches accessibility. But can you tell me a little bit first about your role and how that fits into into Apple's grand scheme of things?

**Sarah Herrlinger:** Yeah absolutely. So, I am the Senior Director of Global Accessibility Policy and Initiatives at Apple and in that role, my team works to make sure that every way that Apple presents itself to the world, whether that be through our products or services, our stores or workplaces, original content for Apple TV, plus whatever it might be, that we are treating everyone with dignity and respect.

**Mark Walker:** Right. So really, hugely, not not simple. From our point of view, simple technology-based accessibility, making the app accessible with that huge gamut of stuff, a huge range of Yeah, it'd be so interesting, so much crosses your desk, so much

**Sarah Herrlinger:** It does every day is different. But really, you know, it's it's in the accessibility realm, making sure that that we just are good to people with disabilities, and that we do everything with keeping that in mind and all that we build.

**Mark Walker:** Cool. And what do you think is the why of it? Why do you think Apple does that, from a point of view your involvement in it and your personal perspective?

**Sarah Herrlinger:** Yeah, I think it's a lot of things. You know, it certainly starts with the numbers. We know with over a billion people on this planet having a disability and 15% of the world's population. It's a huge part of our world, and it affects everyone whether that is personally in your own experience, or someone near and dear to you. So certainly, disability is something that affects us all. But I think even more importantly, you know, Apple was built with a mission to make breakthrough products that change people's lives. And we didn't do that just for some people. We want to do that for everyone. And I think nowhere is that more evident than our work in accessibility. Our first office of disability started in 1985. And that was five years before the Americans with Disabilities Act even came to pass. And so, I think that's a strong testament to the fact that we didn't do this because there was a regularity statement of you must do it. We've done it because we believe that everybody, everybody is an important customer, and everybody should have the opportunity to use technology.

**Mark Walker:** Yeah, well, I guess that's also part of that winning hearts and minds story is that that's much more powerful than making somebody do something, whatever it is they're doing, and they

**Sarah Herrlinger:** Yeah absolutely

**Mark Walker:** Get why they do it and what the value of it is, then, of course, they're much more motivated and connected to it.

**Sarah Herrlinger:** Totally. I mean, I think accessibility work is some of the most creative work you can ever do. When you think about trying to go through so many different use cases, I mean, everybody's experienced with their disabilities unique. So even when we try and think about building new features, we have to think about how they all work together. And how do we make sure that no matter what your use case is, you have a way to be able to interact with that technology in what works for you.

**Mark Walker:** Yeah. Yeah. And so, the pandemic question, everybody has a different sort of stories, but I'm guessing I mean, the scale of the business, that you're in any way that would have affected the internal working, but and also presumably, the products and the shift in that understanding and empathy that you're that you're building on. Everybody's perspective shifted in some way in terms of our knowledge of our customers' needs, and all of that sort of stuff. What What was your take on that over those last few years, I mean, I'm guessing, we should always be careful to say that we're still in it, there's lots of stuff going on around us. So

**Sarah Herrlinger:** Very true. Be a long time that will still be in it in one form or another. Yeah, and I think as as with everybody else, it was quite a swift change, trying to figure out how to continue to do everything in a completely virtual world. But you know, the team did a quick pivot, and really tried to figure out not just how to work in that world, but really to think about what the experience of all of our customers were in that new world and try and come up with some great features to support that. So, to give a visual aid or two, we one of the things that we did was building out a feature called sound recognition for the deaf community being able to give visual alerts when someone or when when a sound was in the background. So, whether that be anything from a fire alarm to a doorbell, to a baby crying or water running to be able to give them via their Apple Watch, or their Apple phone saying, you know, there's a sound in the background that appears it might be water running. We also built in features like people detection, which was a really fun, cool project to work on, because it allowed us to take some of the best of Apple in other areas and use it to support our communities. In this case, we're using the Lidar scanner, which is a part of the Apple camera in our the camera and the iPhone Pro models, also iPad Pros, to be able to understand proximity of someone to you. And it also takes some amazing machine learning algorithms to make this work as well. But, you know, in that world where we suddenly had a social distance, it allowed someone in the the blind community to have a comprehension of when someone came into the frame of view of the camera, where they were and give them a haptic alert, audio alert, visuals, even if you were somebody who wasn't in the blind community, but you didn't know what two to three metres really was, you could be able to get that information as well. So, you know, that was actually an interesting feature that came to us from one of our engineers who was blind, who originally just talked about wanting to know when a line moved, you know, when he was queued up for something. When was it his turn to move forward? But when COVID happened, we fast tracked the that specific feature and got it out within months of the, you know, COVID timeframe to be able to help members of the blind community be able to better social distance.

**Mark Walker:** Is it working.

**Sarah Herrlinger:** I believe it is I think I have

**Mark Walker:** It's all playing there

**Sarah Herrlinger:** Ah yeah, as far as I can tell, I think

**Mark Walker:**

just realised it's playing up there. I was waiting for it to come up there.

**Sarah Herrlinger: Yeah**, I assumed so.

**Mark Walker:** And as you say, that's a knock-on effect of the pandemic. Just bring things to the surface is that, yeah, you're more more aware of those particular practical issues?

**Sarah Herrlinger:**

Yeah, it's sort of taking, taking, once again, the best of what our technology does, and being able to use all of those bits and pieces, hardware software, the operating system itself, machine learning algorithms, all of that to create features that really support our communities.

**Mark Walker:**

Cool. Um, in terms of that, I mean, that's clearly about the innovation, that you're that you're responding to the particular situation. I'm guessing that there's a sort of a broader programme of ensuring that accessibility and innovation are connected in some way or disability. How does that work now? And I guess over time, what have the changes been to, to ensure that it's built in for the beginning when someone's having a bright idea that they that they begin thinking about disability and accessibility as part of that initial spark. I guess that's the goal, isn't it?

**Sarah Herrlinger:**  Yeah. And I think that happens in a lot of ways. I mean, certainly, because we have it infused in our corporate culture as a core value. It's something that people all across Apple are thinking about accessibility as a part of what they do from day one. You know, the team gets in early on new projects, but it's also about our own employees, you know, who are members of these communities, being able to step up and say, gosh, I really wish my device would do this. And then having cross functional teams who bond together to figure out how to make those things happen. Another one we did sorry, got a little video to show as well it's called door detection. And with door detection. Here, I'll just I'm running this, it's got should have both audio descriptions and closed captioning playing as well. So

**Apple Video:**

titles Apple accessibility, a woman using a white cane pointing iPhone camera at the door of a bakery,

closed door, eight feet away. Text muffin to write home about bakery

titles, door detection now on iPhone, an apple logo.

Right home about as well.

**Mark Walker:** A real store?

**Sarah Herrlinger:** Good question. I think we did actually come up with that to avoid any, you know, copyright issues. But yeah, some very creative people in our world there. Yeah. Yeah, so I think, you know, we have a lot of people who start off with ideas, and then once again, we're trying to, to look at what everyone else is doing at Apple and say, gosh, is there something that we can use here, you know, another one that I love, that kind of same thing, this was, we're now using the hardware of the Apple Watch, to be able to understand your muscle and tendon movements. So, if you are someone who has upper body limb different, maybe an amputee, or such, who would only be able to use the watch with one hand, you can now run the entire watch using just a pinch or a clench. So really, kind of saying, alright, what what's everyone else doing at, Apple? And how do we go into the candy store and figure out what all those things are to be able to make our, you know, the work we do for our communities that much stronger?

**Mark Walker:** So, is that is that work that you're doing in the sense of onboarding, and internal training and culture is that sort of thing, which is bringing that, those people together? I'm guessing that there's there's a sense that when people are joining that they're already in the candy store in the sense that they they're aware of all the bits around them? Is that Is that how that programme sort of develops to to ensure that at sort of front and centre when they're thinking of their work?

**Sarah Herrlinger:** Yeah, I mean, certainly, I think for any new employee, when they join Apple, there is an effort to make sure that they understand what our core values are. Accessibility being certainly one of them, we were basically based on six core corporate values. But accessibility is a key part of that. And so, for anyone who comes to Apple, we want them to understand as you do your job, even if accessibility isn't in your title, it's important for you to understand what this means to our company, and to think about it in the work that you do. And that can be for anyone, whether they're an engineer or designer, marketing all the way to a facilities person, you know, we want to make sure that people with disabilities are thought about in our entire process. So yeah, so it's sort of that consistent drumbeat. Once you enter your you know, you're given that overview, but then, throughout time as you work on your projects, there's always people there saying, Well, what about this? And have we thought about what the experience might be? For someone who might never touch a touchscreen? Or who might not hear the audio coming through the device at this point? How do we think about that, and the design of this.

**Mark Walker:** So challenging back each time, the assumptions and all the other parts that are built into the the initial proposal and then through process? Sounds cool. And I guess that also depends into some extent, on the support for your internal teams. I mean, there's that all inward facing the fact that it's a place where disabled people can work and thrive and flourish in the same way as all their other colleagues. I guess that's part of that.

**Sarah Herrlinger:** Yeah, I mean, as the people who design the products, there's a constant flow of information and bug reports and all kinds of things as as people are working, you know, in every team and and that's one of the things I love by building the technology, we can then create an environment where we can hire people into not just the accessibility team but, you know, in teams across Apple. And so those individuals might, you know, some of them may be using more things like Pages, Keynote, Numbers for the iWork suite. And there, they're doing more presentations and reports. Other people may be engineers, and they're more, you know, getting into the backend bug reporting systems, things like that. So, everybody has their own things that they work on. And therefore, they're able to go then to the teams who build these and say, hey, you know, I was working on this. And I think it would be great if we could do this additional thing, or I hit a road here. How do we solve for that? And so, yeah, I love that we're just able to get the best people throughout Apple, because we have the tools that are accessible right out of the box.

**Mark Walker:** Yeah. So, let's talk a bit about collaboration. Later this week. It seems a long way away Thursday, you're going to be talking to Jamie and Eve about, you know, the connections across Google and Microsoft and Apple, and I know that you guys connect and collaborate, you'll be talking about that. What role does that collab play in your work? Generally? I mean, is there particular things you're looking for? Or is it more just out there listening and seeing what comes in? Or I guess a bit of both? As you're going through that through through the different programmes and projects you're working on?

**Sarah Herrlinger:** Yeah, I think, you know, there are certainly times where we, we go back to each other and say, we're better together than we are apart. And that can be everything from the the speech accessibility project that I know, there's some folks who are going to be talking about, I think Christopher is going to be talking about that a little bit more tomorrow. But that's a great project where all of us looked at it and said, this is a problem that for any one company, it's hard to solve, you know, there isn't a whole lot of data out there about individuals with a typical speech. So if we band together to support an organisation like University of Illinois to do research, it makes it easier, if nothing else for the community, you know, I mean, that's the biggest, that's the biggest part for all of us is how do we support the community better, but we've done it in a number of circumstances already things like there's a Braille human interface guidelines out there that was developed a number of years ago by all of the not just the tech companies, but you know, getting to the braille display manufacturers and the screen reader creators and all of that, to come together and say, what's the unique experience of someone who you know, interacts with technology strictly through a Braille display? And how do we make sure that that becomes something seamless, regardless of which operating system you're using? So, I think we try and find those moments where the entire industry understands that the best outcomes are ones where there's collaboration, and then we don't really like each other. So, we find each other and say, how do we how do we make this work?

**Mark Walker:** I've got an interesting question here from from the audience. Will we ever see a standardisation of tools between big providers, Microsoft, Google and Apple? They're particularly mentioned in the EU Commission and stuff like USBC. I mean, that's where the pressure is, I guess in you want to be differentiating yourself. But on the other hand, is your some of you what you described there as is, it's, it's good for the user to know that this convention will be consistent? Because that's part of the tension in the sense of commercial versus the usability or something like that. that crops up I'm sure all the time for you.

**Sarah Herrlinger:** Yeah, I mean, it's a good question. And I don't know that I have a specific answer. Because I think we're constantly trying to look at, at different elements and figure out where they're the best solutions. You know, in that case, with the, the Braille guidelines, it did codify one system, most specifically for Bluetooth, but across other elements as well. And so, I think, where we see there's, there's real value, but you know, things like whether it's one specific type of USB, or what it might be. I mean, part of that is the the industry changes, not just for accessibility, but for everyone all the time.

**Mark Walker:** I wonder if that's easier in accessibility, though, because I guess it's maybe more obvious the collaboration or user benefit in the sense of the start of the problem solving? Is it maybe that's why that's that collaboration and partnership and sort of thinking about guidelines is a little bit simpler. It's less, maybe less controversial or something. I don't know whether that's how it feels when you're doing it, but you probably still got the lawyers on your back asking you questions. But

**Sarah Herrlinger:** I mean, it's always interesting to try and support accessibility as a bigger part of the design process of anything. So yeah.

**Mark Walker:** We know we know; you know, we're all trying to work with WCAG for example, all the time, all those sorts of guidelines. They're an amazing community effort to pull together so many different players and so many different elements into some system which will probably work most times and sort of where we're at at the moment, they know the reason it's been reinvented because the technology and interfaces have moved to create them. So, I guess that's where the collaboration is as well, isn't it in those standards in the connecting in with all the different players, not just the tech companies necessarily, but all the people using like Mali was talking about the banking sector and all their all their services and millions of users. So, I think that's certainly how we see it in AbilityNet, is we find it easier to connect across, because we're using the accessibility it's sort of introduction almost and saying that this is obviously a thing we can work on. And it will be good for all of us. And the community around it is building and the connections that are there. changing tack slightly, what, what sort of technologies do you think you mentioned LiDAR, for example? What sort of technologies do you think are on the horizon in terms of the next few years and changes and not necessarily accessibility features, but more broadly, the technologies that are going to bring value to people with disabilities?

**Sarah Herrlinger:** Yeah, well, I think there's, you know, certainly a lot of buzzwords out there floating around on things people think that the future holds. For me, the biggest thing that I look at is now that we've kind of built the foundational assistive technology into devices, it's it really is more about what is the next consumer thing, and ensuring that that's accessible? You know, we no longer and I don't say that, you know, obviously, there's always new things to make, but it's not like there is a giant area that we have left someone out. So now when we build it's looking at how do we how do we figure out what that next big thing is, and just make sure it's accessible. And so I think one of the big ones that certainly is huge, right now is around machine learning and AI, you know, there are so many things, even as we've done with things like people detection, indoor detection, and sound recognition, and, you know, different elements of machine learning that are being used across disability types, that have so much potential to make the world accessible. You know, once the device is accessible, you start looking at how do you then just make everything around you, more accessible to you. And so, I really love how much we're delving into machine learning as a way to solve that problem

**Mark Walker:** With all of those inputs from the various times. Actually, somebody's asked about the the Pro and the non Pro Tools. I guess part of what's happening anyway, is that the mainstream becomes there's a cutting edge at any particular moment. But the mainstream, that seems to me that's happening quicker anyway, that those sorts of because of the machine learning, essentially sitting in the background, saying, well, what can you throw at me? All these different things, as you somebody's just asking, could you expand a bit on the on the wrist again? Because that is really interesting, isn't it? It's like, you wouldn't you wouldn't conceive that somebody could even use that input. But it's to do with the the sensors on the back identifying what your muscles are doing is that right?

**Sarah Herrlinger:** Absolutely. The the feature is called Assistive Touch for Apple Watch. And you can find it in the mobility section on in the, the settings for the watch. And what it does is by being able to understand that sort of muscle and tendon movement, when you do a clench, or a pinch, and, you know, double pinches, things like that, it will allow you to navigate so much in the same way that kind of you would use scanning software, you can move through elements on the screen. And when you get to the one you want, you can actually you know, answer a phone call or start a workout on the watch, or, you know, do all kinds of things, but doing it all without having to actually touch the face of the watch. Yeah, that one is one that's so totally sci-fi.

**Mark Walker:** It's not gestural like, it is simply the movement of the hand.

**Sarah Herrlinger:** Its just when you're pinching, pinching or clenching.

**Mark Walker:** You can imagine all sorts of conditions and positions that people find themselves in where that's really important. Whether related to disability, or not.

**Sarah Herrlinger:** That's actually been one of the fun things that we found is we have received so much feedback from people who don't self-identify as having a disability who loved the feature, because they're, for example, you know, snowboarders on the top of mountain don't want to take their gloves off or, you know, researchers with gloves on and you know, biological matter, or God knows what, who who, you know, love it, that we actually pulled part of this out into something we call quick actions, which you can find within the accessibility settings as well, that are sort of set up. So, you don't have to have all of Assistive Touch for Apple Watch on, you can just have certain things that you want to do, you know, more quickly with just a simple action. So, yeah, so and that, to me, is also where the the fun comes is when an accessibility feature becomes so popular that the mainstream, you know, gloms onto it and starts using it as well. And then it kind of becomes the gateway to getting people more aware of what's built into our accessibility settings and hopefully they find more things that work for them too.

Then they pass it on as well. It's not for me, but someone I know will find it useful.

Yeah absolutely.

**Mark Walker:** I think, right back to when we first chatted about you joining us, I remember we were talking about accessibility coming from two directions, those are the mainstream features being developed that we can make use of that's a brilliant example. And then the accessibility features being turning out to be something that people find really useful in a mainstream way. And I think that's, that's where we're at now, isn't it all the technologies that are swirling around us, let's say with the machine learning that's becoming ubiquitous, really in the sense of taking all of this information from different places? So, I guess looking ahead at the final question would be, you know, do you think that the, the next three days thinking about that, and then beyond what, what do you think the accessibility community should be looking at in terms of our work and our connecting up and our partnerships? Are there obvious things that we can be doing together, that are going to move us forward?

**Sarah Herrlinger:**

Well, I think a lot of it is, is that connection with colleagues, certainly to have those conversations about how what what can we do together, and that may be those bigger picture things, it may just be, if you're someone who's your company is new to thinking about accessibility, and you have an app, you know, knowing that for whatever platform you're on, there are tools available to you to help that cause and, you know, trying to find those tools and use them to build better products. You know, certainly, all of us who are in the accessibility world, we're here because we believe strongly in support of the communities. So, we're all working to make resources available and to be around to help and kind of whatever can be done to make sure that we you know, across the industry move accessibility forward new ways.

**Mark Walker:** Yeah. Well, fantastic. Well, part of it is that you flew all the way over here to be in this room, instead of doing it on the internet again.

**Sarah Herrlinger:** I know. I'm so excited!

**Mark Walker:** And it is part of that community building, being in the room and catching up and seeing people it's, you do miss that. And but it is fantastic that you've done it. So, thank you so much. It's been a great chat. That's been to hear from you. And thank you, thank you so much for joining us.

**Robin Christopherson:** Very cool. That was amazing. I know what my top takeaway was from that, what's yours, Mark, putting you on the spot,

**Mark Walker:** I will tell you what I think is interesting that Sarah is pointing out and we hear about it a lot, actually, is the crossover between features that are created with accessibility in mind that then get used in the mainstream, and features that are being used in the mainstream, that then clearly make some sense in terms of accessibility and the idea of the Apple Watch, understanding what's happening in your hand, and the things that you can do with that, which wasn't necessarily invented as an accessibility feature, that's one of his primary drivers, I think, but then, you know, crossing that over to all of the situations where you're trying to do something on your watch, and you haven't got the ability to touch it. That's a really simple example. But it just shows the creativity and the opportunities there are when you invest in this inclusive approach, you know, either from first principles, you're trying to literally try to meet the needs of somebody with a particular accessibility need. Or you create some features that, hey, you know what, that's going to be really cool for this person over here. That jumped out a number of times with the Apple Watch. And, man, it's amazing what it does anyway, that it can track what your fingers are doing.

**Robin Christopherson:** I've heavily got into fitness recently, and the Apple Watch utility has gone up hugely. I thought it was AMAZING before, but yeah, hugely into it now. But yeah, simply the fact that it remains authenticated on your wrist. So, for multifactor authentication, some of these hoops that everyone has to jump through to sign into something or to unlock something for people with disabilities is can be a barrier can be a showstopper. You know, it's time dependent. There's lots of horrible codes, there's QR codes on the screen, there's capture images and biometrics, I think particularly with an authenticated device that knows who you are. And that can kind of sidestep that is huge. It's huge today. And I think it's only going to get more important as security becomes more and more, you know, like an arms race. So, for me, the biggest takeaway was LIDAR. And that I think goes exactly what you were saying it's a mainstream thing that can actually, you know, in impact people with disabilities disproportionately for the good. So, for me, the door detection, the fact that a mixture of Lidar and optical character recognition can identify what kind of a door it is, what kind of a handle is read the text on the door to say whether it's a pull or push or an exit or if it's open or closed. Wow, that is so cool. I you know, fantastic and I can't wait for the AR glasses to come out so that I can have that functionality on my face without having to wave

**Mark Walker:** I'm just thinking that's probably the first thing you ever said to me when I met you 11 or 12 years ago, it was me those glasses, those glasses. Those features, the LIDAR features and all the stuff. It's sitting there, isn't it? It's the interface. It's actually making that that device work. It's interesting that you say that. I mean, she didn't talk about that. But you know, we know that Apple is thinking that's where they're going, don't we and, amongst other amongst others, you know, Google and Google Glass have been their key sort of retreated slightly. The Apple stuff is tantalisingly close on that LIDAR stuff is, is why we want to get to it, isn't it?

**Robin Christopherson:** Very cool. That was amazing. I know what my top takeaway was from that, what's yours, Mark putting you on the spot.

**Mark Walker:** I will tell you what I think is interesting that Sarah is pointing out and we hear about it a lot, actually, is the crossover between features that are created with accessibility in mind that then get used in the mainstream, and features that have been used in the mainstream that then clearly make some sense in terms of accessibility and the idea of the Apple Watch, understanding what's happening in your hand, and the things that you can do with that, which wasn't necessarily invented as an accessibility feature, but that's one of his primary drivers, I think, but then, you know, crossing that over to all of the situations where you're trying to do something on your watch, and you haven't got the ability to touch it. That's a really simple example. But it just shows the creativity and the opportunities there are when you invest in this inclusive approach, you know, either from first principles, you're trying to literally try to meet the needs of somebody with a particular accessibility need. Or you create some features in head. You know what, that's gonna be really cool for this person over here. That jumped out a number of times with the Apple Watch. And I mean, it's amazing what it does anyway, that it can track what you think because its doings

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**Robin Christopherson:** Yeah, I wanted to bring it in because I didn't want that to go unnoted. Because, you know, there was only so long that you had in that conversation but yeah, it's in Yeah, all the profanes it's going to be on the glasses which are reported to be coming out next year now, but anyway, so I'll wait a bit longer waited 10 years. Fantastic. Great. We're done.

**Mark Walker:** Lovely. See you soon.

**Robin Christopherson:** Thanks, Mark.