CES 2023: Lead at the speed of life

Taking the metaverse to main street

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Kevin Collins [00:00:05] Thank you for being here. I am Kevin Collins. I'm part of Accenture Software & Platforms Industry. And at the risk of embarrassing my panel, I just want to say this is an incredibly impressive group of people. I'm really looking forward to hearing what they have to say here on stage, joining me on stage, Dr. David Rhew. He is the Chief Medical Officer for Microsoft and also leads their Worldwide Healthcare business. He's also a lecturer at Stanford. He's got six patents. I mean, I could go on and on and on. He's got a long history of just being an advocate and a clinician and a thinker in the space. So really helpful there.

Back behind us over here on the bottom, Claus Jenson, who is the Chief Innovation Officer for Teladoc Health, and he's also an author and a really interesting guy because he's got a technology chops, technology background, but also a product and also front of the house go-to-market and sales and sort of his ability to bounce back and forth between those things is really helpful for the conversation we're going to have today.

And then my colleague, Kaveh Safavi, he is a Senior Managing Director at Accenture. He runs our Global Health Practice. He's also a lecturer at the Kellogg’s School. And so really, really top-notch group of folks. And our session today is called, “Bringing the metaverse to main street”. And what it's about is it was born from some research that Accenture has been doing about consumer behaviors and consumer attitudes on the metaverse and some of that research is out already. Some of it will be coming out over the next couple, three weeks. And the interesting thing about it, I find the research and the outcomes of the research to be really encouraging because, for example, one study that we did, we went out and we talked to 9,000 very diverse audience, 9,000 people. And what came back was that 70% of them knew about the metaverse. That's higher than we expected. 55% of them were excited to be a part of the metaverse. And of that 55%, 90% of the 55% wanted to do it this year. And so, I don’t know if you've seen it, I've noticed there's been a sort of parallel narrative going on out there that says ah the metaverse, it's niche, it's a playground for the tech elites. It doesn't have anything to do with my life, or my day to day. And our research and candidly, what we're seeing in the marketplace contradicts that.

And so we wanted to show in this session some real practical use cases, because one of the things that did come out of the research was that when we talked to consumers, they had a hard time really articulating specific practical use cases. They knew about meeting space, they knew about gaming. But beyond those, maybe they had heard about concerts in the metaverse, but beyond those couple of things, they weren’t really seeing or articulating really clearly how things could be brought into their everyday life. So, we looked at industries that we thought were going to be really impacted. We looked at financial services, consumer products, fitness, lots of those industries but ultimately, we chose health.
And the reason that we chose health, really three reasons. Number one, it impacts every single one of us, everybody. Number two, it really was something that our consumers told us they're really excited about for Metaverse use cases, so that was good. And then the third one was when we looked at barriers to Metaverse. When we hear some of the problems and concerns, things like privacy, data security, you know, bad actors, fraud, these are things that the healthcare industry has been dealing with at a high intensity level for a long time. So it seemed like a really good match. So without further ado, I think what we'll do is we'll spend about 20 minutes asking some questions going through this topic with this panel, this illustrious panel, and then I'll open it up and we'll ask him, take any questions from the audience that we have. So thank you, all three of you, for being here. I just want to start off at the really high level and maybe cover, given your breadth. You can get us kicked off here. From our research as I said, healthcare is one of the biggest places that consumers are really looking forward to seeing Metaverse use cases. Where do you think that's going to show up? What are the use cases that you think are going to be most transformational, and where do you think that's going to show up in people's everyday life?

Kaveh Safavi [00:04:54] So I'll start thanks Kevin. I'll start by saying that I'm fascinated. So many people said they understood the Metaverse. Because I think it's that it's a term that a lot of people use. They're not even sure they know what it means. I think, you know, on the one hand, it's sort of a cool, hip way of rebranding a VR headset, that's all I really mean. And then on the other side is the is the approach that we take, which is the Metaverse continuum really is a representation of the Internet of Place and the Internet of Ownership, which is a whole set of technologies that can be used for a variety of things.

I think for the purposes of health, I think the Internet of Places is easier to understand and the Internet of Ownership. And when I think about that, what I think about is technology that solves two separate problems. The first problem is things where either time or physical location, if you could collapse them, you could do something better than you can do today. So right now, we're already seeing this on the therapy side. For example, a patient with post-traumatic stress disorder can be exposed to the stressor and to therapy simultaneously. In real life, those would not be connected, but you can compress time and location. A surgeon has the ability to do a procedure while superimposing either historical or information from a different place into the surgical field. Those kinds of things are not possible in a traditional world, the Internet of Place allows that sort of thing to happen.

The other way to think about it is really through the through the lens of the Internet of Place allows us to have immersive experiences and the root of this, it precedes technology. We understood this decades ago when we were trying to figure out how to get people engaged in movements. And what we recognized is being in a meeting is different than reading about a meeting. The experience as opposed to seeing or reading something, is more engaging and
more memorable. So where do we see that happening right now? We're already using it to train workers to come up to speed more quickly because of the shortage of healthcare workers. We can shorten the training time and get them into the field faster. That's an example of engagement that is pretty clear cut. We can use it to train clinicians more quickly and what's I think even more interesting in the future is when you think about things like informed consent for a patient right now, you explain something to them about what's going to happen, but in the future, if you can take them through what's going to happen in an immersive experience, the likelihood that they understand and they're not surprised become much greater.

So I see all kinds of opportunities there for making what is traditional kinds of education information immersive and therefore more valuable because of this concept of Internet of Place.

**Kevin Collins** [00:07:38] David, when you and I spoke before the holidays, you were talking about platforms and creating platforms of community and maybe that being a place where this technology may show up.

**David Rhew** [00:07:49] So one of the things that we've seen is that the technologies that we have today with you start with things like virtual meetings and virtual care, these are platforms that we are currently using and we're finding great value out of it. What we can extend our reach in terms of making it more immersive by using the extended reality technologies there. But these are definitely different end points. You know, like talking about a VR headset or a mixed reality headset that's allowing us to be able to think about new potential use cases. And as we think about the opportunity to be able to do that in an immersive environment that allows for collaboration, this is really what the Metaverse is about.

So it's really those four concepts, the concepts of virtual meetings, virtual care, extended reality and Metaverse that is allowing us to be able to start thinking about some interesting use cases. And I'm going to highlight three use cases that I think are very potentially significant relative to the opportunity ahead.

And the first is just around education and training and Kaveh was mentioning about this and we have an opportunity to transform the way that we teach individuals and train them. Think about an individual I'll use myself as like a medical student becoming a resident and then becoming a junior attending and becoming an attending. It wasn't just one episode of learning, it was constantly learning, and when you think about how we could develop potentially a platform that allows us to be able to think about continuous learning throughout the entire lifecycle of our career, we've now got an opportunity to be able to start thinking about this more as a platform.

Now we also have recognized that a huge value for these technologies is that immersive nature that allows us to collaborate in ways that we couldn't have done before. So for instance, if we had a three dimensional image of a molecule that
we are as researchers trying to collaborate across the world on and each of us has an ability to annotate and learn from each other. In a way that almost as if we were in the same room. That changes our opportunity to be able advanced research. And so, you know, the ability to move forward into the collaboration research is tremendous. And then the third is around just clinical care. What we can do now with the combination of all of these technologies is we can transform that experience from a traditional or called 2D visit to something in which the person is literally there. You could imagine a person where you've now got an ability to see first-hand what you're seeing. Yeah, you could you know, we saw this in the United Kingdom during the pandemic when surgeons and other clinicians were unable to visit the individuals in nursing homes for a variety of reasons. And so what they did is they were able to provide the headsets to the nurses in the nursing homes, and they would literally do bedside rounds, you know, moving the patient, looking to see if they had ulcers, checking all the things that you would normally do. But it was being done through we'll call it a human avatar, which was the nurse that was there. And so we have a whole bunch of different opportunities to be able to start thinking about new use cases. But it's all because we're starting to have this combination of technologies that all exist potentially within a common platform.

Kevin Collins [00:11:11] You think about the human, the digital twin of the human body for the patient, but you're talking about actually the provider.

David Rhew [00:11:18] We can do it in many areas. Yes, you can actually have a digital twin of the body with multiple different elements there. But you could also have a provider being virtually transported or teleported into scenarios where they normally would not be able to go.

Kevin Collins [00:11:34] Okay, Claus, you're in the middle of this. What's your view on this one?

Claus Jenson [00:11:41] I think we talked a little bit about that. A lot of the conversation around the Metaverse has been as if it's binary. You're either in the Metaverse or you're not. And I think when my colleague talked about this, it's really not, it's a sliding scale. It's a sliding scale that healthcare starts where the traditional model is. You go to a place and a person that is a single focal point. And now we can start talking about what are the four dimensions by which you can expand that experience, we talked about two. You can make sure you can extend the reach. If you think about virtual care and it's not just connecting, clinicians with patients. It also, as we've just described, the ability to project expertise into a brand environment, think about the ability to take remote expertise and projected into India during the worst of the COVID 19 pandemic or into a war zone or you have a hospital that has specialists sitting in one location, but there's a rural hospital that's part of their network. And how do you get the specialty to actually understand stroke to get there? So there's a whole component about reach where virtual capabilities using either good old, you know, audio video like we're using
here, or you can start using specialized cameras, specialized audio. There's a whole scale of reach that you can go into, so that's one.

And the second one is how immersive it is. It’s sort of one kind of immersive when you’re in a room with someone. The Metaverse is a very different kind of immersive during a virtual interaction. So there's a whole scale around how immersive is the experience. I call on number three, which is ambient. I haven’t talking about that one yet, but it’s kind of interesting. I believe that the evolution of healthcare solutions and technologies, they are becoming more embedded. You think about other industries. We have seen that solutions are just becoming part of our everyday life. They exist in the environment around us. We're not consciously aware of it, I’ll give you an example. If you think about continuous glucose monitoring, you have to measure your blood sugar all the time or pick another example from diabetes management that says, okay, so you’re alone on a road and you’re computer tells you that you have a high value. Now what, now if the technology is smart enough and we have examples of that are live, actually that data point gets beamed to a clinician that looks at it and says gee that’s bad. And there’s an active outreach, you didn’t have to call someone. The system was intelligent enough to determine that something is wrong and to reach out, activate it.

And finally, we have to be able to do that at scale. So there’s a whole set of logistics that come into play in healthcare, where you match up appropriate resources with people that need those resources. So I outlined all of that just to say it’s really not a binary plus or minus, you’re in the Metaverse or not. It's an evolution. And I don’t think we should look at it as this or that. It is how far along of each of those four dimensions are you? We’ve come a long way. Just the capabilities we have now from a virtual care perspective, I see the Metaverse as the next logical one-dimensional evolution that gives it new capabilities, but it’s not like it's a fundamentally disruptive deviation from where we’ve been before.

Kevin Collins [00:15:03] Back to that first one. You talked about specialists in London and sort of being able to extend, as you guys said, extend the capability. We’ve been hearing about workforce crisis in the industry for a really long time. Do you all think that this is one of those things that can actually solve that problem or at least alleviate a lot of that problem? Or do you think it will?

David Rhew [00:15:23] Absolutely. I mean, just start with virtual care and seeing ways that we can extend virtual care to support clinicians. Today the workflow is and, honestly, they’re kind of messed up. The busiest person on the hospital floor is the nurse, and she's running around from patient to patient, doing everything from intakes to vital signs to addressing what food you want, asking answering questions related to whether you’re going home at what time. I mean, all of that can be triaged essentially through a virtual nurse and we have these capabilities today to be able to start impacting clinical workflows using the existing tools that we have. Now, add on top of that the capability to create more immersive experiences where in scenarios where
perhaps it requires a higher level of specialty or expertise.

Let's say you've got a junior nurse that's been brought into a scenario in there and they have the, you know, the training and all the mechanisms to be able to understand what needs to be done. But you don't really know until you're there. And then when you're there, it'd be like, Wow, I wish somebody who had more years of experience could actually see what I'm seeing and guide me down this process and that's the opportunity that we might be able to take advantage of some of these more immersive technologies. So I don't see it as an, you know, one either or, but it allows us in certain scenarios to be able to address situations that we couldn't have done through the normal technologies, the normal processes.

Kevin Collins [00:16:55] You know, I spent most of the pandemic living in Shanghai, and because of the situation there, virtual care became plan A for most people. Like, it was just that the waits in the hospital were so long that massive amounts of the population were all doing virtual care. But that was primarily for diagnosis and a lot of these things. I like what you're talking about, which is being able to provide efficiencies further back in the channel, and that's really helpful. Plus, I mean, as you guys obviously in the middle of all this, are you thinking about how it can go further back in the channel and provide relief to employment problems capacity?

Claus Jenson [00:17:40] Absolutely. Absolutely. And I think it's everything from how do you handle utilizing the capacity, the people you have the best possible look. Everybody who's in healthcare on the provider side, they all them to healthcare because they want to have the patient contact and help the patient, as we just talked about, all the other stuff comes with the territory.

But the more we can automate and alleviate that kind of thing, and the more we can make the engagement model natural, the better off we will all with a better experience for the patient. It will certainly be a better experience for the provider, and it will apply in more time to the things that matter. That's hard to do in a purely physical environment because you literally have to move people around. The beauty of virtual is that you can move presences without necessarily moving people physically, but we all have to all have to think about moving presences, not in isolation. If all we do is recreate the disconnectedness of having to go from place to place to place. But now in virtual, we didn't really solve the problem.

And what people want is sophisticated care, but they also want to really talk to experience. So the real job is to create a connected care experience that transcends the physical system and the virtual system and gives people what they really want, which is whole person care. I want my care team to take care of me. I don't want to have to navigate them.

David Rhew [00:19:05] To the point of going back further up the food chain. If we went even before the person comes into the hospital and start with the training right now, for instance, we have a nursing shortage, you know, burnout leading to
shortage, and it’s created huge ripple effects. Well, what’s the current process? Well, as either hire people out, expensive folks to just come in or you bring some of the junior folks and you just literally throw them into the deep end. And, we were it used to be they may have had spent a year watching and observing. I mean, they’re literally doing right now.

And so one of the things that we’ve been exploring with one of our partners is to explore how we can use immersive technologies to be able to accelerate the development of proficiency of skills that are critical when you are working in a critical care unit. So, things that could be placing an I.V., removing a Foley catheter, all the different types of procedures that require some level of expertise and some training, but oftentimes are not available unless you’ve actually been doing it. Now, one thing that we have seen with immersive technologies that is really interesting is that in these educational settings, people learn faster and they learn more.

And one would say, well, how is that possible? Well, there’s anecdotal evidence that because of the I’ll call it the gamification part of it, people they just spend more time doing it and so we’ve seen this at the University of Michigan School of Nursing, where they’ve been doing this as part of the curriculum and they’re actually having and they’re doing the right now looking to study to see whether or not they can quantify how quickly they can do it, relative to standard training in terms of developing the proficiency skills. Now, if we take this model about how we can then change and accelerate the process for development of skills and education and apply it to situations like the nursing crisis, we have now a capability to bring folks earlier in into higher, more complex situations than previously we couldn’t have done before.

**Kevin Collins** [00:21:09] Yeah. So I’m hearing great, great, great. Like all these things. What, what are the barriers? Why? Why aren’t we? Why aren’t we rocket ship ahead? What are the things that are getting in the way of adoption, both on the provider side and on the patient side?

**Kaveh Safavi** [00:21:27] Well, there’s a few things. I think part of it. Part of it is like, for example, let’s talk about the workforce examples. We already have we know we have a workforce shortage, but we know we have technologies, but yet it’s not so easy. And the reason is, is that if they’re trying to solve the problem of matching supply and demand and effectively what we need is technology to scale human capacity, which is essentially the challenge that we’re struggling with right now. And I show up with technologies that can take, say, 20% of the tasks that a person does, giving them 20% more time back. I still don’t gain a benefit until I remodel the work itself. So I have to take all the 80% jobs, collect them and redistribute them as 100% jobs.

That is not the technology or the technology companies’ problem. But you don’t gain the benefit until somebody else does that work. So showing up with the technology is a necessary but not sufficient answer to the whole problem. And I think that’s one of the big challenges we’re seeing right now, is people are showing up...
with tech. And the answer is, that’s great. But what about the other part to getting the full benefit? So we have that issue. I think we are always concerned in healthcare about concepts of privacy and tech that exist on paper and pencil and anything digital just amplifies that risk and all of the concerns get layered in now. So whatever we get right, we have to get right even more in these kinds of conversations because these digital conversations and these digital information is more accessible once it’s created in a digital format. And that means potentially more and more issues associated with it. So we have we have an issue that just needs to be continuously addressed.

I think we have a general lack of trust of technology companies as a player. Work that we’ve done. Who do you trust with your information in healthcare? Generally speaking, technology companies don’t do well even though they’re leading. And so the challenge of how do you address that issue is real because they’re just not trusted entities.

Kevin Collins [00:23:33] So who does that?

Claus Jenson [00:23:34] I think that’s exactly right. I mean, this is this is not a single science problem. It needs to be rooted in clinical science because it has to be the right thing to do clinically. You do need the technology that is, as coverage is said, is not sufficient. You need logistics, which is the third sign, you actually need behavioral science as well, because self-care is healthcare and how we entice not just clinicians but actually the patients to do the right thing is important. All of which has to be underpinned by data science. So if you think about it, what we’re talking about is reinventing the camera, redefining what it means to have a multidisciplinary care team.

And it really is not a binary either or, if we just try to replace what we have, we’re not solving anything. You have to figure out how to blend across the virtual system, the immersive experiences, and integrate that and partner with the existing delivery systems that are out there. You can’t take them out of the equation. You got to replace surgery and you can help the surgeon, you can help the surgical team, but you still need to do the surgery somewhere. So I think often we try to look at things black and white and say we need to replace is the wrong answer. You have to amplify what are we not replacing.

Kevin Collins [00:24:48] So who does that workflow redesign? So you come in with the technology, as Kaveh says, it’s not the technology companies problem, right? At hospital, everybody’s running around like crazy. They can’t do it. Who does that? How does that work get done?

David Rhew [00:25:03] Well, it has to start at the organizational level at the top. I mean, this is the culture change. If you prioritize clinician well-being as one of your top priorities and you start thinking about all the repercussions of whatever you’re doing and how you can adjust that, you can’t just rely on one solution because, you fix one problem but then what tends to happen is all the other work then tends to overload that come back to the clinician because they’ve got now more time.
And so we really do have to start thinking about all the things that impact clinician burnout and start looking holistically at this. But the only way that's going to happen is at the leadership level. There has to be a commitment towards resources, towards education, training and a long-term view on this, not just simply, you know, can I save a few dollars here and there because it's not going to be as simple to fix like that.

Kevin Collins [00:25:54] Are you seeing some of that? Are you seeing people and any of you are you seeing that starting to take hold in these organizations? It seems like the benefits that you've all described are huge. So are you starting to see that?

David Rhew [00:26:06] We are absolutely going to.


David Rhew [00:26:14] Yeah, I'll say that when it was just about the clinician well-being, it got some people's attention. But what's happened is the financial pressures that have now been applied by bringing in extremely expensive resources to potentially try to close that gap have eroded all the margins and brought organizations into the red. And that has now a business problem.

It's a business as well as a workforce problem and when you have both of those things, when you're looking at it to try to solve this, this then becomes an issue that is top of mind for every C-suite. So I think the quick answer is yes. It is no longer just simply that we're going to fix it by trying to do this one fix here and there. I think people are starting to realize that it's going to require a far more comprehensive approach and it has to be our top priority.

Kaveh Safavi [00:27:09] And I'll just add that. So we're definitely seeing the delivery system owns the problem, right? So it can't be out. It's not it's not just a turn on light up a piece of technology and the answer occurs. However, there's an interesting thing that's happening for people who are bringing these solutions forward.

So we had an ebb and flow right for a while that everybody brought human based services and then that's really not a great economic model. So everyone wanted to be in the software business and didn't want to be in the services business, and software was great. However, actually the implementation of this is too complicated because it's a human machine dyad. You have to build a work process around the technology to gain the benefit. And so what you're going to start to see is an emergence of companies that are actually providing a whole answer of optimized processes and technology to solve specific functions that will essentially take over that function for a period of time until the organization itself can take over the people part.

So moving away from pure technology answers because they're not going to be able to bring a value proposition to the table. They're going to have to be paired up with the process and actually bring a whole answer to a discrete problem. You're not going to be it's not going to be the whole like it's not a whole hospital
restitution, but people who are optimizing a function by thinking about the technology and the process together and own an outcome, I think you’re going to see more of those kind of businesses for the next half a decade.

Claus Jenson [00:28:33] 100%. I mean, it’s what we live every day. I mean, we almost never have a conversation with any of our clients that are just about, delivering clinical services or just about delivering a technology service. It’s always how does that service fit into the bigger environment that’s going to live. And it almost always transcends all of, technology, clinical services, and people, I mean, it’s actually why partnerships are critically important. This is not something that you go alone, it’s too complex a problem, it’s too important and it sort of requires a different mindset in terms of what does partnership even look like.

Kevin Collins [00:29:14] Great. I’m going to shift gears just a little bit. And one of the questions that keeps coming up around Metaverse in almost every domain is whether we’re exacerbating or creating even more of an accessibility gap, more of, you know, of an inequity between people getting out, getting access to these. I know all of you actually, when we when we connected before the holidays, all of you had mentioned that as a question or a concern that’s worth thinking hard about. So what are some of the things that are that are out there that are trying to solve these problems? And what are some of the big problems that you’re seeing? Want to go first David?

David Rhew [00:29:49] Sure. I mean, I'll just start with when during the pandemic, when we saw huge advantages with virtual meetings and virtual care, it became very clear that there were some haves and the have nots and those that didn't have the capability because of lack of broadband, affordable broadband access, the ability for them to be able to even have devices that supported these. I mean, these were major factors. And, you know, one of the things that was sort of an innovation that came about from that was that we realized that we could through public private partnerships and mostly through philanthropy during the pandemic, but now starting to recognize that with these models where we can start working and focusing on what is it that we can do to affect specific subpopulations that are underserved and don’t have these capabilities, we can start closing that gap now. That's just a starting point. Now you have to start addressing the whole issue around digital literacy, and then it gets to healthcare literacy. So it really is a multipronged effect, but that would be one aspect. Now, the other thought is, could you start thinking about maybe using 5G as also a capability to be able to bring these some of these technologies? And that's also something that we're starting to see as well. But I think in general, you know, this is just one of multiple different ways that we think about health equity and health disparities.

There are other reasons that people cannot take full advantage of some of the technologies that we have. There are people that have decreased vision, decreased hearing, decreased
mobility, decreased cognition. And if we start thinking now in terms of intentional design to make sure that whatever we do, we've got capabilities that address those bigger, broader populations, then we have something that is far more inclusive and would allow us to be able to help achieve some of those equity goals.

**Kevin Collins** [00:31:34] Plus, you were talking about this a little bit as well. Right. And what's your view from your side of the house on how this is going to evolve?

**Claus Jenson** [00:31:45] And first of all, I mean, health equity is something that we all should keep front of mind, it's that important, so totally agree with everything just said. If you think about health equity, it's a complex challenge and it's everything from technology access. But it also very much as David just shared is about where people act and how they think about the problem and I will tell you, there are people you can't get to be on a video screen with a clinician. This is they won't do it, that's just not what they do. But you might be able to get them to answer the phone.

There are people that insist that they have to go to an office because they're used to it, and that's what they're comfortable with. You have people that have mental health challenges that don't want to go outside their house, even for things that we might say from a clinical perspective it's really better if you went to a provider facility. We can do tests that we can't do at home. Our ability to understand the personal circumstances of every single individual. We just require that fusion of the five sciences I talked about, that ability to understand the individual is actually a huge unlock for health equity because it's not about doing right. It's about having a partnership with the individual that gives us the best possible outcome that they want. And that's just a problem we've never been able to address before. I think we have the tools now to address it, but it means hyper personalization of not just the experience, but also the choices we collectively make in what is the right mode of care, when, where and how.

**Kaveh Safavi** [00:33:27] Can I give a slightly unorthodox answer to this question?

**David Rhew** [00:33:31] Please...

**Kaveh Safavi** [00:33:33] I think that this is, to me, very much a half empty or half full conversation. So we can all stipulate to the fact that digital technology is unevenly distributed. Now we're just going to decide how we want to describe that reality. And the reason I make that point is because you can argue that some people don't have digital and some people have, and that's inequitable. I would argue that there are people who will never get care if the physical model for care was the only option. Ever, ever, ever. And it's going to get worse. And there is no hope of solving that problem without digital technology to make it available. So will it ever be equal? No. Does it ever need to be equal? No.

But if to argue that we would have been better off without it than with it to me makes no sense in pretty much any context. So I do think that we're going to actually, this problem is going to get worse. The workforce
shortage is going to be felt more critically in already vulnerable populations, rural populations, poor populations. And they, more than anybody, are going to need digital technologies because that's going to be the lowest cost chassis for them. And that's also going to be the only way for them to get access to providers in some cases. So I think the push for more digital because of the underserved is going to go up, not down.

**Kevin Collins** [00:34:58] Do you agree?

**Claus Jenson** [00:34:59] And here's a couple of interesting data points. 50% of Americans don't have a primary care physician. Of the 50% that do, half of those haven't seen their primary care physician in more than a year. Case closed.

**David Rhew** [00:35:14] Yeah, I definitely agree. We know that rural populations, underserved populations, these are, these are populations that will suffer the most relative to the need for these types of technologies. But at the same time, there are things we can do. At Microsoft, we initiated an effort to bring affordable broadband to the world, essentially, you know, in developing public private partnerships. A lot of heavy lifting, a lot of work and policy work. But it's possible and we have been able to make substantial strides to do that. So it's not like, you know, we can simply say, well, these are two big problems, we can't solve it. They are problems that are large, but they are things that we can close the gap. Now, if you look at some of the recent legislation around, you know, how we're trying to close the gap, I would say that the primary emphasis there is on distance. So rural absolutely will benefit the most from this this increased funding. But where we may also see a greater need is in the urban areas that don't have affordable broadband, that will not get the funding because of the way that is designed that the programs are designed. So I think we need to start carefully looking at, you know, our approach. Our approach has to be thoughtful, it has to be balanced.

**Kevin Collins** [00:36:38] So you're saying that just because I'm out in the country versus I'm in an urban area, that's not necessarily the metric that's driving whether I would benefit most from this technology or not.

**David Rhew** [00:36:50] According to how the funds that will be allocated. Those are the individuals that are in the communities that will get the funding. Now, if you are in an urban setting and you don't have affordable, you're lower on the list, you're probably not going to get the funding. So you know that that dichotomy is going to be something that people will notice.

**Kevin Collins** [00:37:16] Okay, look, it would not be CES if I didn't ask you to pull out your crystal balls and so having had this conversation and having gone through all this, I just want to go around the horn here and predict for us how you think this is going to play out. What do you think is going to happen as these technologies continue to advance, as it gets better, as all of these concerns start to bubble up with privacy, with regulation, we need to talk about as all of these things start to come
together. What's your vision for the future in this area? Kaveh, do you want to kick us off?

**Kaveh Safavi** [00:37:53] Sure. I think the next five years things are going to go much faster and it's all going to be driven by the shortage of labor. That's the forcing function. Healthcare is a ecosystem that's designed to stay in equilibrium and not and to resist change, except when it's faced with stress from the outside. The pandemic proved that. I think that we are. If you do the math, the labor shortage problem is going to be is going to get worse and be even worse in a decade. It's going to be two decades before we age out of the problem again and go to a different math in terms of supply and demand. That to me is the forcing function. So I think it's going to go faster, but it's going to be technologies that solve the labor problem that are going to get the most benefit.

**Kevin Collins** [00:38:33] So Gen X just not enough Gen X people to do it.

**Kaveh Safavi** [00:38:38] Not enough Gen X, not enough millennials. There's 25% fewer human beings in the age group between 40 and 60 than there are between 60 and 80 right now.

**Kevin Collins** [00:38:49] Claus, what do you think? Crystal ball time.

**Claus Jenson** [00:38:54] Crystal ball. Five years from now, we've solved the village doctor paradox. We have managed to fuse a highly capable, modern healthcare ecosystem that delivers the specialized care you get with an academic medical center with a village doctor, emotion and experience that actually has a care team that longitudinal in case care. I would call that whole person care but actually native whole person care that is built from the ground up in a way that takes care of you as an individual. It ties into everything we talked about personalization, choice, diffusion of the five sciences. Five years from now, some organizations will have cracked the code on the village doctor paradox and it'll be the new gold standard for care.

**Kevin Collins** [00:39:37] Wow. Well, that's hopeful, right? Okay, bring us home. What do you think?

**David Rhew** [00:39:42] So I think if you look at the Metaverse today, extended reality, a large part of that are use cases that are nice to have, it is helpful, sure. But where we may eventually see some very important use cases driven that are needed to have will be because of driving pressures like the workforce shortage the need to collaborate and innovate at a more rapid pace to be able to keep up with the competition, to be able to deliver care, to address health inequities because of distance in other areas. These are going to be drivers for why the combination of Metaverse extended reality, virtual reality, virtual collaboration are all going to be essential to be able to solve those, because you can't solve it with just one of those technologies. It really is about a combination of those, and that's going to be the tipping point when we start seeing more and more use cases that are need to haves. And then the second piece will be it can't just be about, will this one use cases the reason why we use it, it's going to be have to be made easier. So if people and organizations have invested into virtual care, they've
invested into virtual platforms around meetings, and this is now an extension of that capability, it makes it a lot easier for people to want to adopt that and willing to adopt that. And so it's both the need and the use cases that will be defined very clearly around need to have, but then making it easier for organizations to be able to adopt it.

Kevin Collins [00:41:10] Yeah, as I've heard from you all a couple of times now is that it's not just patient adoption, that is the problem. It's actually the workflows. It's the organizations in the back end, the adoption there.

David Rhew [00:41:23] It’s the biggest barrier, in fact, we see when we talk to start-ups all the time, they're like, oh, we've got this amazing solution, it's going to sell like hotcakes. It's like, “Well, who has to prescribe it? Where does the data go? Does it get into the ER?” I mean, you start going into these conversations, then you realize that it's going to be a one off and no organization is going to adopt it because it's sitting on as an island. It has to be part of their existing strategy and their platform. And that's why when we talk to organizations about what their digital strategy is, they're thinking broadly about, you know, we're going to start moving our data to a single data lake, we're going to start applying A.I. on the disparate sources. They're not talking about buying multiple different point solutions.

Kevin Collins [00:42:08] Okay, we've got about 2 minutes left. Anybody have a question? Maybe you have a microphone, or you can just say it loud and I can repeat it. We've got a microphone in the back. Anybody have a question for this group while we've got them? I'm happy to keep going if you don't want to, but I wanted to make sure we had some time.

Okay, then let me ask one last question and I want to touch on regulation, we skipped over it. Obviously, data, data privacy, all of these issues in this industry are about as high of a concern as in any industry anywhere. So how does that impact our ability to do these things that you're saying? Are regulators caught up on where we're headed with this? What needs to be put in place? How do we make patients comfortable? How do we make care providers, insurance company, all the different players comfortable with these technologies? And what's happening when the data world, nobody wants to see that kind of thing.

Kaveh Safavi [00:43:11] I'll give you a quick on the Metaverse. So the second part of the Metaverse is something called the Internet of Ownership. This is critical because it's the ability to do commerce in the Internet when in an environment where you don't actually know the person that actually works in healthcare. Because one of our biggest challenges is the ability to act on information and have the right to act on it and it's accurate. Those are Metaverse technologies that we will be able to begin to append information, and it will be much easier because the information in and of itself will contain attributes that create permissions and allow us to act. Right now, we don't have any of that. And that's a big barrier because now we have to trust parties to do the right
thing based on contracts versus actually making the information discretely identifiable or usable or not, so I see that Metaverse technology as very promising as an answer to that problem.

David Rhew [00:44:03] Claus.

Claus Jenson [00:44:06] But adding to that, because I don’t completely agree with what was just said. Adding to that, I think that does two of the things we have to keep in mind. One is a lot of existing legislation was created for an environment that was basically physical. And if you look at the actual letter of many of the law, you can see the imprint of its model in how it’s written. I think as we evolve into more of a hybrid environment, we have to not necessarily replace, but perhaps adjust some of the languages just to allow choice in terms of how we look at what a care model actually looks like. And then the second part is look, regulation and legislation can do a lot to promote a different way of providing care. So it’s not just about the area, it’s also about the active things that can be done from a regulator perspective in terms of promoting the kinds of care models that all those would be made to go through the existing legislation, which is there for a reason, but adapt it so it fits in the hybrid environment and then push the envelope on where are we going next.

David Rhew [00:45:17] So one of the exciting things about CES is that we have seen a transformation of consumer technologies to now something that is much more enterprise and even healthcare specific. And in that journey, I think we’ve recognized that several of these applications and tools do require some level of regulatory review. And so the FDA and other organizations are now looking very carefully at select use cases to clear certain solutions for use within managing certain conditions, whether it’s diagnosing, whether it’s treating, and that process of working in collaboration with the regulators to be able to help define what does need to be regulated, what doesn’t, is going to allow us to be able to start thinking about those next big questions, which we don’t really know the answers to because we’ve not really seen some real strong, compelling use cases of the Metaverse, specifically within healthcare.

It’s really something that we envision will be highly useful down the road. But once we actually start getting greater uptake of these particular use cases, I think that’s when it’s going to be very clear that that collaboration with the regulators, based on the fact that we’ve already been working with extended reality solutions and virtual care solutions, is going to give us a better sense of that roadmap.

Kevin Collins [00:46:43] Thank you, all three of you, for all the time and insight. I really appreciate it. Thanks for jumping in. Thanks for joining remotely. Thanks to all of you for being here. Really fascinating. I feel like we could do this for 3 hours and I still would be just at the surface. So thanks a lot and have a great rest of your CES.