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Accenture-AHA Webinar: Meet Healthcare Leaders in the Metaverse

Explore a New Continuum of Technology and Experience

Stephanie: Excuse me, ladies and gentlemen. Thank you for your patience in holding. We now have your presenters in conference. Please be aware each of your lines is in a listen only mode. You may submit your questions electronically anytime using the Q&A pod located to the left of your webinar platform. You may also download a copy of today's presentation using the resources pod located directly below the Q&A pod. It is now my pleasure to introduce today's first presenter, AHA Moderator, Monique Showalter. Please go ahead.

Monique: Thank you so much, Stephanie. Welcome everyone. This is Monique Showalter with the American Hospital Association. All of us here at AHA hope each of you are safe and well and thank each of your organizations for your outstanding care and dedication to the patients of your communities. AHA is pleased to be hosting today's webinar, entitled "Meet Healthcare Leaders in the Metaverse: Explore a New Continuum of Technology and Experience."

This webinar is brought to you through the generous support of Accenture. Knowing what to expect from technology in the next several years is critical for healthcare leaders to understand as you build your digital strategies, invest in new technologies and build the skilled teams for the future. During today's session, we'll dive into four technology trends that are reshaping healthcare as we know it. This year's Accenture Digital Health Technology Vision report, "Meet Me in the Metaverse," illustrates the sweeping changes that will occur in healthcare as we become immersed in digital content, programming the world around us using synthetic data and computing the impossible. Dr. Kaveh Safavi, Senior Manager, Director of Global Health for Accenture, and Brian Kalis, Managing Director with Accenture, will lead an engaging discussion with innovative healthcare organization leader, Kristin Myers, with Mount Sinai Health Systems. You'll hear about new research findings, learn about leading-edge technology trends and strategies to pursue to be better

positioned for the fast-changing future of healthcare. Note too, that we've also allowed time for your questions. We've already received several, which our speakers will address as time allows. If you wish to download the presentation or the insightful Accenture Digital Health Technology Vision report, you can easily do so through the resource section of your screen at any time. Also, the event is being recorded and the replay link will be sent to all registrants and attendees shortly after today's event. So with that, it's now my pleasure to turn the floor over to Dr. Kaveh Safavi for speaker introductions and program launch. Kaveh, the podium is yours.

Kaveh: Thank you, Monique. It's a pleasure to be here. Thank you all for joining us, taking some time in your afternoon to join us for this discussion. I hope you find it interesting, and somewhat entertaining and maybe a little bit provocative. We are going to talk about a topic that gets a lot of press, and maybe we will expand your thinking about what the words mean. Accenture has been looking at technology trends for the last 20 years, and we asked the question—where is technology going and how will it impact business and society? This year's topic is so important that big companies are actually changing their names because of it. And we thought it would be worth it for us to really get into that dialogue. We talk about the metaverse, but we actually talk about the metaverse as a continuum. It's a set of capabilities that are enabled by technologies that are now accessible to us that allow us to do things we were never able to do before. And what we're going to do today is talk about both the metaverse and what it is, as well as the technologies that underpin it.

Joining us today are Brian Kalis. Brian serves as the strategy leader for our healthcare business in the United States. And Brian is also the principal author of the healthcare version of our Technology Vision. And Kristin Myers, who serves as the CIO of Mount Sinai Healthcare in the New York metropolitan area. Mount Sinai is an academic medical center that has served the community for over 170 years. It's a $9 billion organization that comprises every conceivable part of a healthcare system. We're going to start today with a presentation from Brian to explain to us not only the metaverse, but four specific technologies that are building blocks for the metaverse. And then we're going to transition into a conversation with Brian and Kristin about the implications of the metaverse; what it is, what it can be, how do we start, where are you today on the journey? And then we're going to have a chance for you to join the conversation. So feel free to put your questions in the chat and we'll try to get to those questions before we end out the hour. If you want to read the full report, it's downloadable on the screen that you see. You can also go to accenture.com and search for Healthcare Technology Vision to find the documents. And we hope that you get a chance to look through the material in addition to what you're going to hear from Brian today. So with that, Brian, what exactly is the metaverse?

Brian: Thanks, Kaveh. We really view the metaverse as the next evolution of the internet. And building out how you mentioned this, there are a number of different things to talk about, related to definitions. So one is the metaverse continuum and that is really this increased blurring of our physical and digital lives. And it's that continuum of experiences as technology gets threaded, that ultimately is shaping the next evolution of the internet. If you look at the history, we start with Web 1.0 in the 90's, specifically. With that, with the first evolution of the internet, it was connecting the world's information and bringing things all together. In the mid-2000's, we started to see Web 2.0 emerge, and that was the rise of social media, mobility, and user-generated content and really advancing ecommerce to what we hadn't seen before. Now, as you describe this, the metaverse, we're seeing this as the next evolution of the internet. And that is where technology is connecting people, places and things in real world and virtual worlds. And what we'll do is we'll explain this concept of internet of place and internet of ownership, as we move into further trends. Now, one question you could ask is, well, why now? Now is a unique moment and we're on this next decade of digital transformation. Why is this happening?

There are two key reasons. One is technology advancements. If the first digital wave of Web 1.0 and Web 2.0 was heavily powered by SMAC—or social, mobile, analytics and cloud—and that's still taking hold today as that digital foundation, and it’s extremely important.

What we're starting to see is another acronym of DARQ—so distributed ledger or blockchain, artificial intelligence, artificial reality, and extended reality and virtual reality, as well as quantum computing—start to take hold. The second reason or driver is related to consumer behavior. And with consumer behavior, increasingly our digital lives are becoming as important as our physical lives, and our identities are moving into the virtual world and we're starting to see this blurring. The second part of that is demographics. We have full generations that grew up participating and working in virtual worlds like Roblox or Minecraft. For example, my kids are in Minecraft and even wanted to have birthday parties and celebrations that connected into the virtual world, and the ability to connect with friends in the community in that space. That generation is moving up and is naturally flowing between digital space and physical space and wanting to see those two connected. So with that, let's look deeper at the four trends, as Kaveh mentioned, and we'll give additional detail on the definition of the metaverse in this.

The first trend we have is Web Me, and this is really all about the metaverse and virtual world. So with that, we have the metaverse as an internet of place, a new experience layer on the internet. The second component is the internet of ownership, which is a new data layer on the internet. So let's unpack those a bit. So a new experience layer. Today, we're used to viewing content through either a browser or a mobile phone.

What's emerging is the ability to both be present with content, whether it's fully immersive in a virtual reality environment where we're in a virtual world, or if we're actually seeing digital information overlaid on the physical world. Simple examples of that are if you use Instagram or Snapchat, how you're able to actually apply filters, or if you recall the game Pokémon Go where you're able to play a game, walking around the world and parks in your community and have digital overlays. We're starting to see that emerge.

If I look at the internet of ownership, an example is today your data is owned by centralized platforms. We're really starting to see this shift where data will move with the person and not the platform. And a key part of that is also your digital identity. How you know who you are to access different experiences can also move in a physical space. So if you take examples like you see today, like Clear. Clear allows you to quickly get through an airport. I can also use Clear to get into stadiums in physical space. What's on the horizon is I could use that same Clear identity to also access digital spaces and content, blurring between those two worlds, as an example. To further bring this trend to life, I'll give two examples within healthcare. One is around metaverse technologies. If I use metaverse technology, one of those is virtual reality, and there's a company in the healthcare space called SimX. And SimX is a virtual medical simulation training platform.

And what they're able to do is simulate different medical events, where you can bring in clinicians during medical education, or in terms of planning for other education, to ultimately simulate in a real life, fully immersive environment, a different healthcare event. And found ways to reduce or increase productivity by 20-30% through simulation-based training versus just viewing training.

Now, if I go a bit more futuristic and talk about the proto-metaverse or a virtual world, there's another example of a company called Genopets. If you recall, a couple years back, there were things with virtual pets called Tamagotchi. It was a key chain. It was a virtual pet where you would feed it and as you fed it, it would grow and give its different life. Now there's a company called Genopets, which really is the first move to earn NFT or a non-fungible token in game. But how that works is I'm able to connect my Apple HealthKit or Google Fit data. And the more I move, the more I will earn digital assets and keep my pet alive. Those digital assets now I can share in third party marketplaces, and ultimately share with other people and ultimately generate commerce. So that's trend one.

If I move to trend two, and trend two really shifts from the virtual world to the physical world. And trend two, programmable world is all about how technology is being threaded into our physical environment. And it's turning our physical world into an environment that is as smart, customizable, and programmable as the physical world.

We see three layers to the programmable world. The first layer is the connected layer. And that includes adding connectivity in the physical space, through technology like 5G, edge computing and IoT. The second layer is experiential. And this is where now we can experience our physical environments in a different way. We can interact with our environments because there's connectivity threaded throughout. And this includes things like ambient computing, where you're able to use voice to capture medical dictation or other, where you're able to use digital information to overlay the physical space. And the third is the material. And this is where technology is being threaded into how things are made, whether that's clothing like this, whether it's physical space and how those can all interact. Let's give a couple healthcare examples on this.

On the connected layer of programmable world, you have the example of Verizon working with Emory Healthcare related to deploying 5G as a use case within their environment. And that's a strong connected foundation to unlock future value. The second use case on the experiential layer is how the NHS in the UK worked with Microsoft HoloLens for virtual rounding. They were able to use a single clinician to do rounds during COVID-19 while having other physicians virtually come into the environment, ultimately to increase safety. That led to approximately 83% fewer staff in those wards to increase safety in the space. Lastly then, on the material layer of physical good, there's a company called Nanowear, which has connected clothing.

A connected clothing can help monitor a number of key vitals for people. And that has been used with CHS patients ultimately to keep them healthy.

I'll move to trend three, which is the unreal. Trend three is about two key things. One is synthetic content or how artificial intelligence is creating information objects like in the real world. And the second piece is synthetic data. And synthetic data is again using artificial intelligence to generate data sets that are not real, but based off reality, which then can be used to train AI models. To give an example of the unreal, you have IBM or you have Anthem working with Google to create petabytes of synthetic data sets for two purposes. One, they want to improve fraud, waste and abuse detection. The other thing they're looking to do is improve overall health management. What is unique about synthetic data sets is it can preserve the privacy of their existing medical records. And then it also can increase historically underserved data sets, or data sets where historically underserved populations, where it's typically sparse. And what they're trying to do is experiment with that as a way to ultimately increase equity in their data sets as well as train additional models. All right, transition to trend four, and then we'll get into some discussion here.

So the last trend is all about the next generation of computing, and that's called computing the impossible. What we're starting to see is new computing machines are starting to emerge, and new ways to compute that are ultimately more efficient, faster,

and can solve problems that we can't solve today without massive computing resources. And with that, we see three kinds of computing paradigms that are emerging. The first is massive parallel computing or high-performance computing. The second is bio-inspired computing. And then the third is quantum computing. As one last health example, before we get in discussion, you have an example of the Folding@Home program, which was really trying to leverage distributed massive parallel computing on people's desktops to ultimately solve complex protein folding problems, which is also useful in drug discovery. What ended up happening is they were able to surpass computing paradigms ever seen before and get to actual scale by using that massive parallel computing paradigm to start to improve protein folding. And we'll have a lot more examples as we move into discussion. So that gives you a survey and covers things like metaverse continuum. What is the metaverse and some enabling technologies. Now I'll turn it over to Kaveh so we can get into a panel discussion about these trends.

Kaveh: Thanks, Brian. That was really interesting, but let me ask you a question. Go back to the beginning. Every time I see somebody try to describe the metaverse, I see a picture of a virtual reality headset. But you described a lot more than that. Is metaverse just another thing for virtual reality or do we even need virtual reality to take advantage of the metaverse?

Brian: It's a great question. Maybe the direct answer is virtual reality is an entry point in terms of the metaverse, but is not required. And maybe a different way to say this is what the metaverse is not. The metaverse is not a single technology. The metaverse also is not a single place. You don't go to the metaverse. What is the metaverse? Metaverse is a collection of technologies and it also is an interconnected set of spaces and experiences similar to the internet, which is a collection of networks and information.

Kaveh: That's very helpful. Kristin, I want to shift over to you because one of the first questions that comes to people's minds is just a reality check about where healthcare is at in the journey of digital adoption. And, we know that we're taking advantage of digital technologies. We know that we're taking advantage of technologies a little bit behind the adoption of other sectors, and we are still having debates about things like electronic health records and how to make data interoperable. As a CIO of an organization, how do you begin to engage an organization in these kinds of conversations about how far out technology is going and why people should be concerned about it? Why investments should be made? Why change is necessary in a much greater way than what we're used to thinking about?

Kristin: That's an excellent question. I think that the key really is to start with sponsorship and being able to have that conversation with your executive leadership. Our president and COO, Margaret Pastuszko, really understands that in order for us to grow, we need to continue to invest in technology. And I think it's also about that constant communication through various channels to all of our stakeholders. In fact, we actually have a digital technology partners Tech Talk series where every month we have a different speaker from my leadership team. And we talk about technology to all of our employees and anyone can attend. I think change management also is just critical to the work and making sure you have a comprehensive change management and communication strategy around the work that you're doing. And having a governance structure with representation from across the business and making sure that the transformation efforts that you're putting forward always are in alignment with the organizational priorities and the mission of the organization.

So as it relates to digital, we have developed an ambassador model of change agents, coming from every part of the organization, from frontline employees to senior leaders. And I think that integrating as much as possible the technology and the operations teams and, looking at feedback channels, are important not only for our patients in which we have focus groups, but also our employees.

So I think that, just constantly making sure that you are informing people about where technology is going and, giving them practical use cases in healthcare and then really building momentum around a business case and ultimately a return on investment.

Kaveh: Well, on that point, go ahead, Brian, please.

Brian: I was just building up to what Kristin was saying too. If you go with the here and now, it's very important to have that strong digital foundation. As you look at cloud data, and artificial intelligence and all of the things we're seeing health systems do today to start to put that foundation in place, it's extremely critical to prepare for this next evolution. So the answer there is, keep doing that. And then, Kristin made a number of great points there too. Another one is a concept of technology execution and strategy being combined. What you do as an enterprise to build your digital fluency or teaching people fundamentals, just business knowledge of what are these emerging technologies, becomes increasingly important as a way to drive that change, like Kristin mentioned.

Kaveh: That raises a really interesting point. And I want to ask Kristin her reaction to this. In the full report, you'll find some survey data and that's also part of the way we do the report. And one of the themes that we've been building on over the years is that you can't separate a technology strategy from a business strategy anymore. In the most recent survey actually, 97% of the healthcare leaders that were in the sample said that technology was more

important to their long-term strategy than demographics, economics or politics, which sounds pretty pervasive. Does that seem realistic? And do you think that people actually buy that it's that critical to the business, that it's fundamentally going to change the way healthcare works?

Kristin: I do think it fundamentally will change the way healthcare works. What I would say though is, the economics are always extremely important because if you are unable to make any margin, you really can't support the mission. But I think that technology is key in terms of being able to help with some of the cost optimization, but also, the innovation of the future. And I do agree that the technology is becoming part of the business strategy in a way that we've never seen before. And I think that COVID really accelerated that.

Kaveh: So you mentioned return on investment and, this is a question that starts with foundational technologies and then maybe we can end it thinking about where metaverse technologies are going. We historically think about the return on investment for technologies, either through the lens of care that is more accessible care, that is better and safer or care that is more affordable. As you think about the journey your organization has been on, which of those do you think drives the return story the most, and do you think that's going to change? And do you think the metaverse technologies might actually change the return-on-investment calculus?

Kristin: The area that we have been most focused on, from a near term perspective, has been easier access. And part of that digital strategy looking at how do we actually bridge the digital divide. We've been conducting focus groups with our patients and our frontline employees and even just consumers in the market that aren't Mount Sinai consumers to really understand what are the current gaps and pain points in regard to access. And so we are very focused on building that seamless omnichannel experience, for access and building products to help patients navigate care options. I do think though over the next few years, programs like Hospital at Home, remote patient monitoring, are going to help us deliver more care in the community. And, we are also focused on data science and developing products and a portfolio of products that really support patient care and reducing harm. I know that's a wide variety of technologies that we are focused on, but near term is access. And then I think longer term is more about delivering care in the community.

Kaveh: Very good. Brian, you talk to all kinds of healthcare organizations. What perspectives are you seeing in terms of the broad business case for these kinds of technologies? And do you think it's going to shift over time?

Brian: Great question. And kind of playing off what Kristin said, there is a regular question that comes up when you introduce the metaverse. What's the use case? Where should I use this? What's the ROI and so forth?

Which is an interesting thing, going back to our definition point, because metaverse doesn't have a universally agreed upon definition and is so broad. It'd be like asking what's the business case for the internet, right? Which is kind of the equivalent. But that doesn't mean there isn't a way to get started. So, how do you think about this? One is to apply metaverse technologies to create value today. Now, what does that mean?

We mentioned a number of technologies that may not be the vision of the metaverse, but they're building blocks. That includes augmented reality and virtual reality. It includes artificial intelligence. It includes 5G. So there are use cases and ways to create value in those individual technologies today. And they'll eventually converge. The second piece would be to explore what I'll call proto metaverse virtual platforms to prepare for the future and those true virtual worlds. So today those things are platforms like Decentraland, Sandbox, Upland, as well as even Roblox and Minecraft. So they're not the true end-state vision, but they're kind of there. And exploring ways to put branding in those spaces, do some initial interactions in those spaces, and then eventually connect physical and virtual, but that's tested out. And then lastly, those two will converge. You're applying those metaverse technologies today with ROI and with value. Exploring these proto metaverse worlds starts to allow those new ways of creating value and new ways of unlocking those.

Kaveh: And I think Kristin made an excellent case for access. Brian, do you think that we can actually impact healthcare affordability with these technologies beyond access?

Brian: Yeah. Let's go to the workforce shortage, whether that's clinical labor, nonclinical labor. You are seeing how these technologies can be applied to get better labor productivity. And that could be for speeding up the time to training, speeding up being able to get more from less by connecting decentralized resources through technology. I think there are a lot of applications on that side. And then also reaching people in new places. I think new access points to build on Kristin's point. How do you reach and engage people to different spots?

Kaveh: Very good. So I want to go to the two ways you defined the metaverse. One of them was the internet of place and the other was the internet of ownership. But I want to focus on the concept of place right now. It's an interesting concept, right? Because we think about place very physically in healthcare delivery, because what we do requires serving patients in a physical way. When you talk about the internet of place, are you really talking about a digital alternative to a physical location or something that is a blended place? Can you help us understand a little bit more what that means? And maybe use an example. You did a little bit about what it means today, but what might it actually mean in the future so we can really understand what this new internet might feel like.

Brian: Yeah. Building up to your point, the aim is actually that there is a virtual place or a replica of the virtual world plus physical space, but the ability to come interchangeably between the two. What is that looking like today? That is looking like full virtual worlds where we, like people like ourselves, could all come together at one time to actually communicate, collaborate and connect in a different room. In those immersive spaces, they can be accessed in different ways. They can be accessed today through a browser, they can be accessed through a mobile phone or fully immersive headset, as you mentioned. So really what we say is that new experience layer where we can immerse in things.

Now where we'll see things moving, if I give a healthcare example, is one large national health services company actually built a space to be able to help people with their health and well-being. It was a virtual world where they were able to go in there and they were able to engage with clinicians to ultimately help them meet specific health and wellness goals, and they could participate in different activities. That same thing actually came back to the physical world. And a fun fact about that particular virtual world is that actually happened over a decade ago. So that was about 2006 when the first expression of that happened in a virtual world called Second Life. Now what's happening, is connecting the physical experiences and you're going to see the two flowing together.

Kaveh: Kristin, you do this every day. I'm curious from a practical perspective what you would share with your organization about what the internet of place might actually mean and, what you either are working on or plan to work on to bring this to life?

Kristin: Yes. I really think this can be revolutionary for our medical and nursing students. They can have that distinct experience that replicates the physical world, but being able to remove constraints. So being able to practice surgery procedures, building empathy for patients that are underserved. And I also think from a patient perspective, the ability to manage their health with self-care and education would be of tremendous benefit. In our medical school, in fact, there is a push for us to really invest in this technology, specifically with the examples that we've given. So that is on our 2023 list.

Kaveh: This conversation is interesting because it reminds me of a body of research that precedes any of this dialogue, around how do you change a complex adaptive system? Healthcare being a complex adaptive system, societal system. And there's actually a school of thought that says that you change a system through conversation. And the example is that it's different to be in a conversation than it is to read about a conversation. And it strikes me that what you're describing is the difference between reading about a procedure and actually practicing the procedure or seeing the procedure as a different way to learn. You're nodding your head, Brian. Am I onto something here?

Brian: Yeah, agreed. And maybe I'll build on that because there was a question of what value can be created and how could this be used? It can also be used for operational efficiency. If you're able to replicate a digital version of your facility, you also can simulate people's movements. You can simulate clinical flow, patient flow; you can simulate moving things to try to improve throughput for clinicians and so forth. And when you're starting to see that happen, where people are creating a digital twin of those physical spaces, and even using information that tracks traffic patterns to simulate, how could we improve throughput? How do we move things around? How do we ensure the right things are in the right place at the right time in those simulated environments? And that's ultimately driving operational efficiency and a better patient experience, through that simulation.

Kaveh: Kristin, are you considering using this to help patients anticipate or understand what an experience might be like? I've read about pediatric hospitals trying to get children to understand what it might be like. Is this something that's going to be more mainstream?

Kristin: I think so. I definitely think in the next few years, this will become mainstream. I think the technology from a patient perspective has tremendous benefits. And your example about pediatrics was a great one.

Kaveh: What about one area that struck me that could really use reform with these kind of immersive technologies? Things like informed consent. Because right now, all people do is just basically read a document and you're supposed to understand what's about to happen. It seems like if someone could show me what was going to happen rather than just read to me, that might be a better way to communicate what might happen. I don't know if anyone is working on that right now, but it sure seems like an area that deserves attention. Go ahead.

Kristin: Interesting. Definitely because I think people just sign the forms. Very few people actually opt out.

Kaveh: Very good. Brian, you were going to say something? Go ahead.

Brian: Yeah. I was just building off the use case example. There's one for how you can use communication and collaboration, even just within your workforce and how you can collaborate differently. The other area is virtual therapeutics. There are therapeutic uses of specifically virtual reality or immersive technologies that are starting to emerge. And specifically in areas of PTSD, behavioral health, other forms of pain management, there's been an extensive body of research over the past 20 plus years, building that up about how some of those immersive therapeutics can start to be used also for clinical applications. Now, if you take Web 1.0 and 2.0, digital therapeutics started to emerge. You could see the next evolution of those solutions being in fully immersive environments where it makes sense.

Kaveh: Thanks, Brian. I want to go to the internet of ownership. This one's a little harder for me to get my head around. You started talking a little bit

about this being somewhat anchored in this concept that the data is ours and that applications come to us, as opposed to we go to them. You were describing a little bit of that. Can you help me understand from a healthcare perspective, how internet of ownership might make a healthcare experience different for a patient?

Brian: Yeah, I'll start. And then Kristin, if you want to build off that. One, I'm going to go with identity. The concept of identity and knowing who is a person is a very complex topic, as you all know. In this paradigm, this is a shift where your identity, your digital identity and your physical identity, can move with you. You are the owner of it, and then you bring it and then share consent into these, in the healthcare context and other pieces. We're also doing a fair amount of work internationally with self-sovereign identity in this use case, outside of the U.S. And we're seeing that start to emerge and could start to move into how we can address some of the challenging issues with identity management. That's one piece. The second piece then is data ownership. And that's the shift where I would actually be the steward of my healthcare data as an example, and similarly provide consent on who can use it for how long and be able to manage that. And it's a completely different paradigm shift, but we're starting to see early technology plus early examples of where that's shifting. That will likely take a long time to evolve from where we are today to the future. But that is the principle of the kind of the spirit of that trend.

Kristin: I completely agree. I think that increasing the trust of information, who can access it, how do we improve accessibility of the clinical data? I think it is all opened up with possibilities. With the metaverse, I think that patients are going to be able to share relevant information to their designated care providers. I think that it can improve patient care, but it's really the democratization of data. Whether the patient is truly in control and it's not the institutions or platforms. And I think a great technology example would be blockchain as an enabler of that. I think that organizations, such as Mount Sinai, from a short term perspective, really need to look at how do we prioritize the gaps that we have, with digital transformation and analytics, and make sure that from a foundational perspective with the cloud, we are putting all of these things into place. And then from a long-term perspective, we also have to make sure that we're starting the journey around AI and machine learning and robotic process automation and that journey towards the metaverse continuum. Mount Sinai is on its way, from a short-term and long-term perspective. But I think that the advice to other institutions is to really look at that carefully.

Kaveh: It seems like this could really change the nature of the policy conversation around consent. Because today we give our data to somebody and we give our consent rules and then we hope that they pass that on, and they adequately or fairly represent our interest. And Brian, based on what you described in the future, that data will carry with it, the ability, the knowledge of consent.

And there won't be any dependency on a third party to accurately represent our intent. Which I think we would all consider to be a significant move forward in our willingness to share data. That's very good. Thank you. I want to talk about the programmable world. Brian, you described a couple of really interesting examples of things that are programmable. One of the areas that I think fits into this category, is this whole idea of ambient technology. The fact that technology is around; we don't have to go do anything in order to take advantage of it. Do you see that as a kind of programmable technology that we're going to get benefits from in a pretty quick amount of time?

Brian: Yeah, it is. And the concept of ambient computing and just being able to use voice in the context of your space, fits to that second layer of that experience layer. And you're seeing examples of a number of different vendors out there as a way to capture clinical documentation, as well as to have a more natural human interaction during a clinical encounter. So that's here today and evolving, and I think we're just going to see it keep taking pace.

Kaveh: Kristen, there's got to be lots of things that you must be working on that fit into this programmable world narrative. What are the ones that you think are going to have some of the great impact for your organization?

Kristin: I think it's a combination of technology such as 5G, high speed internet, the internet of things, looking at sensors, providing data, ambient computing.

We have pilots beginning in both ambulatory care and our inpatient setting for our physicians and nurses. The augmented reality I spoke about in the medical school for our students. And then Brian mentioned before, the whole concept of having this digital twin. I think that as part of our overall command center strategy, which is already a virtual hospital, we need to look at, what are the real time insights into operations when changes occur? And I'm really excited about that concept and working with the leadership team on that, in the coming year.

Kaveh: So I want to shift to the last trend for a moment here—the computing the impossible. This is fascinating to me - this idea of the scale of computing moving past the scale that we're used to. And we're used to in healthcare thinking about larger amounts of data, not as much about larger amounts of computing, but here we're talking really about that kind of evolution. Looking at computing, where do you see the demand for this level of computing showing up in healthcare? And why will we care in healthcare about this kind of computing capability?

Brian: Yeah. Maybe before, Kristin, you want to share an example of some of what you're doing at Mount Sinai?

Kristin: Yeah, to your point, I mean the computing power has been exponentially increasing and we are doing a lot of machine learning and deep learning. We actually have now a Dean of Artificial Intelligence with an entire academic department.

So, this is an area we are investing heavily in, as well as our high-performance computing team. We're also investing in the cloud so that we can really ensure that our machine learning models and also our RPA technology is able to run in a high computing environment. There's a lot of investment that is occurring, but there's been a lot of investment in the past that will continue in the coming years. It's extremely important. I just think about the research and discovery aspect of our mission and how our research is responding to COVID. The innovations and the novel work that they were able to produce during that time because of the tools that they had available, the computing power.

Brian: Yeah. Kristin, your collaboration with SandboxAQ too, on quantum computing and looking at post quantum cryptography to maintain patient record security, like anticipating that future. There is this risk with this new compute paradigm that we could uncrack or decrypt a lot of the encrypted information that's flowing across the internet. There's a lot of effort, like what you're doing, to find what is that next level of cryptography to ensure that we can keep information secure for the long term. The other piece too, is what's often referred to as the traveling salesperson problem, and that is optimization and route optimization. To go back to one of Kristin's earlier comments with care shifting to the home, there is this question of if care shifts to the home, how do you make sure, how do you get the right person to the home at the right time, through the right route? How do you get the right supply to the home, through the right route? And how do you do that in near real time where the home model becomes the core as a very complex computing problem? And some of this compute possibility becomes an option to help address that.

Kaveh: I also know that the field of artificial intelligence is migrating to a new approach. Which is, rather than having large amounts of label data, it still large amounts of data, but actually higher levels of computational activity, more computation. So it's shifting the emphasis from data to compute. And we're seeing that in some of the robots that are appearing outside of healthcare. And I think to your point, Brian, maybe that's going to be where we're going to need that ability, those physical robots that are doing these tasks that need to know where to go. They're going to be more dependent on compute than we may be able to offer in a traditional kind of an environment. I want to shift to audience questions. We have one. I'm going to start with that question and we'll be taking other questions from the audience as well. Lots of discussion about health equity. Do we think that these metaverse technologies are going to be useful in our willingness, desire, ability to make healthcare more equitable? Maybe let me start with Kristin, and then Brian, on your thoughts.

Kristin: I think my initial response is it could really exacerbate the digital divide. We see it every day here in New York City. I think that there is a digital divide.

There are people that don't have smart phones and, or don't have the ability to use applications, because they don't have a data plan that supports that. So, it certainly has the capability of increasing the risk of lack of equity. Brian, interested to hear your thoughts.

Brian: Yeah, I agree. And building off what Kristin stated, this is a line. There's a concept called the responsible metaverse, which we list in the report and is something we're putting a lot of effort and energy into. And that is at the end of the day, it is up to us to now design with equity and inclusion in mind. If you go back to the initial evolution of the internet we have today, a lot of those factors weren't built into the design. It really comes down to us, as we're shaping this next evolution, to really follow the principles of inclusion. And that is have people from historically underserved populations shape this future, as well as being very intentional and mindful as we shape that evolution.

Kaveh: Very good. Another question from the audience, I think, is worth entertaining. Lots of technologies. We have lots of experiences, but there must be headwinds. Any thoughts around these metaverse technologies, and their adoption, and maybe some of the headwinds that we're going to have to face or overcome as part of driving this adoption? Kristin, maybe I'll start with you since you probably face this every day.

Kristin: Yes, there's enormous pressure on all providers to really do more with less, constantly. Even with those pressures, I think that there are some core technologies that you have to continue to invest in. And we certainly are. The cloud, for instance. We are on that journey and we are going to continue to invest there. Also our data strategy, machine learning and AI. These are areas that we're going to continue to invest in and we're not cutting those areas. I just would strongly encourage other providers to continue, even if it's at a slower pace, with the foundational technologies, because you will prepare the organization for the future.

Kaveh: Brian, from your perspective.

Brian: Just building off of what Kristin stated. I think there is a bit of encouragement to keep building that digital foundation of cloud data and AI and keep those investments, even if constrained, because those are the foundational underpinning of this next wave. Then if I go to, well, let's look at the next wave, I'll kind of restate what I mentioned earlier, and that is around how to get started. There is a bit of apply metaverse technologies to create value today. That does mean technologies like augmented reality and virtual reality, 5G as examples and Edge and IoT. Experimenting with those on top of that and applying those, they're individual things that will then kind of prepare you for that next wave. The second wave of exploring if you were to look at the pro metaverse virtual world, can be done in an R&D capacity and can be as simple as taking, if you're a health system and you do branding in a physical sports arena today, work with your marketing teams to bring that branding into a digital twin of it in a virtual platform, like Decantraland, and that starts to get the learning going.

Kaveh: So this is really not a kind of a gradually then suddenly; it's a continuous progression and a continuous building. Really, you just keep adding blocks on in terms of gaining advantage. There's a really interesting question here about the role of collaboration with technology companies, third parties, payers. Kristin, I'm going to connect that to a decision that you made as an organization, a public decision to move your electronic health records to a public cloud. I wonder whether or not that kind of a decision has, whether that connects up to your thinking about where technology is going. Can you talk a little bit about that?

Kristin: Yeah, I think that making that announcement and, really having that, collaboration with Microsoft as a hyperscaler, has been I would say a very important decision for Mount Sinai. And, we've been able to have governance and controls in place and ensure that we get expected performance out of them. But again, it comes back down to making sure you've got the governance in place and that high degree of collaboration with the leadership there to ensure that the program is going on plan and that you have that transparent communication to make sure that you're successful.

Kaveh: Do you think that the payment experimentations that we spend a lot of time thinking about as a way to change healthcare are a positive or a negative force for the adoption of these kinds of technologies, or neutral?

Kristin: It can be a barrier. I think a great example of what we've seen in the past was telehealth. And prior to COVID, we were all trying to come up with how to incent our physicians to partake in telehealth. And we had very low adoption, even though we had the tools. Suddenly when COVID hit and the reimbursement model changed, we had nearly a hundred percent adoption with telehealth. So I think that the reimbursement models have to change with the technology, and need to adapt to support it. But I think telehealth is a great example of that.

Kaveh: So your position is just not neutral. It's either going to help or hinder.

Kristin: Correct.

Kaveh: And Brian, what are you?

Brian: No, I agree. It's either the accelerant or the barrier, depending on what ends up happening. Maybe, and said differently, this ties to reimbursement, this ties to digital equity and so forth. We didn't solve these problems yet in Web 1.0 or 2.0; we still need to solve these problems. It has the risk of being exacerbated if we don't solve it in this new paradigm, if we don't start making headways today. Positive momentum is what we have seen, for example, from the FDA. The FDA has already started a medical virtual reality working group that is exploring these applications and testing them and trying to leverage some of the work in reimbursement in digital therapeutics and apply it in the space. Early days, but a positive signal.

Kaveh: Brian, you just touched on something I wanted to check on. In addition to payment, are there other big regulatory or policy issues that we need to clear or deal with if we really want to take advantage of these technologies? Anything else you want to add to that list from a regulatory perspective? Or Kristin?

Brian: There are plenty. This actually came up in a discussion with another health organization earlier today, and that was just related to HIPAA and HIPAA rights. And we talked about data ownership. A significant paradigm shift where the person's the owner. And you also have right now, the definition of who's a covered entity versus who is not. Well, if you're the owner and you can bring your data to anyone, do we need to revisit the definition of who's a covered entity to ensure protection, to broaden it, as an example.

Kaveh: Very good.

Brian: That's just one of many.

Kaveh: Kristin, anything else you want to add?

Kristin: Yeah, I think the security risks. Also, some of the cyber security risks are something to pay attention to, as part of this and also the data ownership as Brian mentioned.

Kaveh: Very good. I'll end with a near term prediction question. We are seeing very immediately an economic situation that's affecting healthcare organizations in particular, driving up their cost structures. Do you think that the environment creates a headwind or a tailwind for the adoption of technologies like these? Is this going to be a promoter or a detractor for adoption? I'll start with Brian then go to Kristin.

Brian: I would say it still comes back to that point of, continue investing in the digital foundation. And I think we're seeing a pattern similar to what Kristin mentioned. And that was, we're seeing continued and accelerated investment in cloud data and AI. And then we're also seeing other disruptive events in the market that even if you were retracting, you're realizing that we're already in a world where different models are emerging and we have to keep increasing relevance.

Kaveh: Kristin, your thoughts.

Kristin: Yeah. I think that as I said, the pressures on providers are immense and it can be a headwind. But I think that during COVID, many organizations adopted some of this foundational technology and they just need to continue with that investment, especially with cloud data and AI. Make sure that your digital foundation is strong and continue the investment even if it's at a slower pace.

Kaveh: I think what I hear you saying is that COVID proved this, right? That the circumstances prove that the only path out really does require technology and innovation. Without it, we don't actually get through the storm. Kristin Myers, Brian Kalis, I want to thank you for joining us, and for joining this conversation. Our contact information is below. If anybody wants to reach us, there's a hyperlink at the end of the report PDF that we just shared. Monique, thank you.

Monique: Thank you. So that concludes the time we have available for today's session. Shortly, all attendees will receive an email with a link to the webinar session. Replay the presentation slides and that tremendous report that Kaveh had referenced. We thank you and welcome your sharing that with others in your organization. Most importantly, thank you so much for making the time to participate in today's webinar, and a very sincere thank you to our sponsor, Accenture, and to our tremendously informative speakers, Dr. Kaveh Safavi, Brian Kalis of Accenture, as well as Kristin Myers with Mount Sinai Health System. That concludes today's program. Have a wonderful afternoon, and please stay safe.

Kaveh: Thank you.