

Siemens Healthineers: Medical Technology Leader



Transcript from October 18, 2019
Customer Spotlight Webinar

Tim Crawford: Thanks, everyone, for joining us today in this exciting conversation. I'm incredibly excited to jump into it. I'm joined by someone who I've started to get to know and found to be incredibly knowledgeable in the space and that is Peter Shen. Peter is VP of Business Development for Digital Services at Siemens Healthineers. Peter, maybe you could just take a minute and introduce yourself and a little bit about Siemens Healthineers. Folks may be familiar with Siemens but may not be familiar with Healthineers and how Healthineers fits in. Let me turn it over to you for a minute.

Peter Shen: Super. Thanks, Tim, and appreciate the opportunity to chat with you here. I'm Peter Shen. I'm the Vice President of Business Development for Digital Services here and digital health within Siemens Healthineers. Siemens Healthineers is essentially the healthcare portion of the large German conglomerate Siemens that's known worldwide, but within Healthineers, we're the leading medical technology company that's been around for over 170 years. We've got over 48,000 dedicated colleagues around 70 different countries who are focused specifically on trying to innovate and shape the future of healthcare. An estimated 5 million patients globally every day benefit from the innovative technologies and services that Siemens Healthineers has in the areas of diagnostic and therapeutic imaging, laboratory diagnostics, molecular medicine, as well as digital health and enterprise services. We're a well-known entity in the medical field and a lot of our customers, a lot of patients, a lot of providers all utilize Siemens equipment and Siemens technologies and we're proud to be a global leader in that area.

Tim Crawford: That's great. Well, Peter, we're happy to have you take part in this webinar. To help us set the stage, I think it would be good if we talked about who the Siemens Healthineers customer is and the kinds of challenges that they have. Can you take a few minutes and share who that customer is and what they look like and what they're challenged with?

Peter Shen: Yes, sure. Our customers are really healthcare providers who are focused on patient care at a time where, quite frankly, the healthcare landscape is changing quite a bit. Everything from reimbursement to technology is really affecting our customers right now and that actually poses several challenges for our customers, including the need to really try to expand precision medicine to try to be more accurate in terms of their diagnoses and their treatments. They want to transform the way that they're delivering care, trying to optimize things through more efficient practices. Then also overall, try to improve that patient experience to make sure that the patient remains in focus and that they get quality outcomes that matter to that individual patient.

Within Siemens, we really believe that we can help our customer address these different challenges through digitalization and leveraging our long history of both clinical and engineering expertise to really

leverage the emerging technologies that are forthcoming today and deliver new and innovative platforms and solutions to help our customers across the entire healthcare continuum.

Tim Crawford: As you talk about innovation, innovation plays such a dramatic role today in healthcare and I want to hone in specifically on the clinical experience. Can you talk about how Siemens Healthineers has leveraged technology to change the clinical experience specifically?

Peter Shen: This is a great question, Tim. Because right now, as in a lot of industries, but in particular, within healthcare, there's just an exponential growth of healthcare data and within that data, there's a wealth of real critical clinical and operational information that's key to helping treat that individual patient. The solutions that we're trying to create here at Siemens, like our CTs and our MRI machines or laboratory pieces of equipment that are processing lab data, they're actually contributing to this growth of healthcare data. Then the challenge now becomes, how do our customers, how do these providers process all this data in a timely fashion and deliver the important clinical results found in that data to the doctor for diagnosis and treatment? If you think about the requirements to process this data—it's very significant. It could be as simple as trying to identify and characterize maybe a lung nodule in an x-ray of the chest for a patient, which might be just looking at kind of a static image or it might be more complicated where we're looking at the beating heart in a functional MRI exam where we're trying to now maybe measure or calculate the heart ventricle volume of that beating heart while it's moving.

It's a bit of a challenge, because the requirements change whether it's as we're dealing with the human anatomy and we're dealing with physiology and things that are moving and whatnot. This is where our partnership with Intel and the wide breadth of processing capabilities that Intel® solutions provide become so important for our engineers within Siemens. We can really focus on developing algorithms and clinical solutions to process these critical clinical findings regardless of what these processing requirements are and without having to worry about all these technical or infrastructure limitations. Our teams are really just focused on getting that right clinical information out and getting that right clinical decision there. They don't want to be encumbered by technology limitations. This really helps ensure that we can deliver precise clinical results back to the physician in an optimized way and then also improve the patient's overall healthcare experience.

Tim Crawford: One of the things that we talked about that I thought would be good to share with the audience was how you can do multiple algorithms simultaneously. Can you take a minute and touch on that? I found that to be really interesting as opposed to the traditional approach of single streamlined diagnostics, do one diagnostic at a time.

Peter Shen: This is, again, why the partnership with Intel has been so valuable to us. A great example of this is we recently launched our new AI-Rad Companion platform. It was just recently FDA cleared for clinical use for our customers now. The Siemens AI-Rad Companion platform, what we try to do there, is we're leveraging artificial intelligence to process large amounts of imaging data to basically help us identify, characterize, and quantify clinical results automatically for a physician so that they can just review them and then use them for diagnosis. At Siemens, we're really excited about this because it really introduces to the market a complete AI platform for clinical diagnosis and not just an individual

algorithm or product that's focused on one particular abnormality. The processing performance that Intel provides for us and specifically the second generation Intel® Xeon® scalable processors designed for AI really help us ensure, again, that we can deliver those critical clinical findings assimilated by a platform like the AI-Rad Companion to the physician in an expedited fashion. Furthermore, the OpenVINO™ Toolkit that Intel provides also allows us to configure and optimize multiple AI algorithms for the platform at the same time.

To your question, Tim, why this is all important is really from a practical sense, because in the real world when a patient comes into the hospital, we might not know exactly what disease or ailment is affecting that patient. For example, a hospital might prescribe a chest CT exam to help identify a problem when a patient presents themselves complaining of difficulty breathing, and that chest CT exam might reveal a number of different things. They might be having trouble breathing because there might be some sort of blockage in their artery, so we may need to look at the coronaries of the heart and see what's going on there. Or they might be having trouble breathing because they've got some sort of nodule or something within the lungs themselves, and they can't take in as much air when they're breathing. So we might have to look at the volume capacity of those lungs, because it could be multiple reasons as to why that patient is struggling to breathe. We need to be able to run multiple AI algorithms really quickly to help us determine what the problem is. This is, again, why we're so excited to have a complete AI platform for a clinical diagnosis like the Siemens AI-Rad Companion. With the power of the Intel infrastructure that's optimized for AI, it's flexible enough where we can run these multiple algorithms at the same time and run them quickly and efficiently so that we can get to that proper diagnosis.

Tim Crawford: I thought that was just a great example, just one of many that you and I have shared. I thought it would be good for the audience to hear that because, to me, that's what brings this whole experience to life and really provides some color to what people are experiencing.

You mentioned the Intel partnership as part of this equation in your success, and I want to shift gears a little bit and talk about that a little further. You talked about the [Intel] Xeon processor and how that fit in. The partnership that you have with Intel is not new, and I think that's also something else that's important for folks to understand. Is that there's some history here too. Maybe you could spend a minute and talk about that. Talk about the partnership.

Peter Shen: For sure, Tim. We've had a long-standing partnership with Intel as I mentioned earlier. We've been talking here about data and how we leverage artificial intelligence to get through data or whatnot. As I mentioned, we also generate a lot of data with all our different pieces of the imaging equipment or lab processing equipment as well. Just about all of those items are actually powered by Intel® processors. Now what we're really trying to do as we evolve our partnership with Intel is really trying to leverage again the computing power and the flexibility that Intel provides to be able to process all this data. Again, a key point for us in this world of digitalization for our healthcare customers is really being able to process this exponential amount of data in a timely fashion and deliver the right clinical results back to the clinician so that they can make the proper diagnosis and treatment. This is really the important aspect, and why the partnership is so important for us. We are clinical experts in our field, and we want to design technologies and solutions that make sure that we get all the important clinical

findings to the right individuals within our customers. We don't want to worry about these different technology hurdles or anything of that sort. We want to partner with someone like Intel who can help us navigate through those technology hurdles so that we can focus on what we do best, which is focusing on the clinical aspects of healthcare.

Tim Crawford: That's great. As part of that, if you extend that, not just the partnership, but also look at your ecosystem, there are some aspects that come into play as you think about the overall healthcare ecosystem. Can you share your perspective on the ecosystem and how things like teamplay and edge-to-cloud because edge-to-cloud is such a prominent conversation point these days? How does edge-to-cloud play a role and where does teamplay? Maybe introduce teamplay for those folks that may not be familiar with it?

Peter Shen: It's a good question. I think many of us are familiar with, but especially in healthcare, our customers, they're very sensitive to emerging technologies and that's why you hear at Siemens that we need the flexibility to offer both cloud-based solutions and on-premise solutions and platforms to our customers. As I mentioned earlier, what's most critical for us is that independent to that platform, we need to be able to deliver consistent performance to ensure that those critical clinical findings and results get delivered to that physician without any technology challenges. A great example of this is our Siemens teamplay digital marketplace. Basically, what that is, it's a cloud-based platform that offers our customers access to solutions either created by Siemens or from our third-party clinical and operational partners. Whether it's real-time operational analytics tools from Siemens or individual niche clinical algorithms that come from our partners. The teamplay digital marketplace or digital ecosystem provides our customers a wide array of different individual solutions. With that also means that there's also a wide array of different computing needs to deliver this optimized consistent performance to our customers.

Again, this is why this partnership that we have with Intel is so critical, whether it's leveraging AI with our AI-Rad Companion solution to help with diagnosis or leveraging the teamplay digital ecosystem for clinical and operational solutions. All these platforms that Siemens has developed, they're developed for the long term here. We're not in it to just create a single algorithm or an individual product, but actually a platform where new solutions are constantly being created and added. Again, we need to have that computing flexibility to deliver more algorithms and more solutions in the future and hence why Intel and Siemens, we actually regularly share our different roadmaps for the future together. We want to make sure that we need to drive that high-level performance from edge to cloud to ensure that we deliver those critical health decisions that meet the high requirements of our healthcare customers. That's what's important. Again, it's important and reassuring to our customers that they know and they can expect the same high-level performance across our different Siemens platforms. Again, independent of the clinical area that they're focused in and independent of the technology that they're looking at.

Tim Crawford: I think it's great that there is that mutual buy in to future success. We've been talking about the clinical aspect of this and I know that Siemens is working on a platform that is starting to take a look at the patient experience. The patient experience, I know from our past conversations, is very

close to your focal point because it impacts everybody. Can you talk about how you're thinking about the patient experience? What are some of the challenges that folks are running against and maybe some of the innovations that you're looking to bring to market that's going to impact that patient experience?

Peter Shen: In the end, it really is all about the patient for us. A lot of the benefits that we've talked about here up till now technology-wise or whatnot have benefited our customers and they're realizing these benefits firsthand. More importantly, their customers, the patients themselves, they're enjoying an improved patient experience because of the technologies from both Siemens and Intel. A good example of this is a patient can go into a hospital and experience optimized exam procedure times. Basically, spending as minimal amount of time as necessary to get their procedures done thanks to some of the real-time operational monitoring tools that are provided by the Siemens teamplay platform that's connected to our imaging equipment.

Additionally, that same patient then can also have their exams reviewed and diagnosed by a radiologist or a clinician efficiently and with greater precision and accuracy. Again, thanks to the artificial intelligence platforms like the Siemens AI-Rad Companion that's powered by the AI solutions from Intel. Again, the patient experience, whether they're having an exam or having their clinical results reviewed is all streamlined for them—thanks to the powerful and flexible technology that's provided from Intel.

Tim Crawford: That's great. As we start to look forward, Peter, in terms of where you go, obviously, you've made these huge moves forward in bringing innovation like being able to run through the multiple algorithms, thinking about the patient experience and improving the patient experience, what's next on the horizon? You've made some great progress. What are you looking at next?

Peter Shen: It's only the start for us, Tim, actually. At Siemens, we really strive to become the leader in clinical decision support to help the patient through the entire healthcare continuum through personalized medicine. What this means is, it's not only finding what the right diagnosis is or treatment is, but also creating a therapy plan that is optimized for that individual patient.

Platforms that we're currently developing like the AI-Pathway Companion, what we try to do there is really look to leverage patient data across multiple sources. So, looking at imaging data, laboratory data, and even genomic data to try to accurately assimilate and analyze that data to create a personalized treatment plan that's optimized for that individual patient. To do that, quite frankly, it's not a trivial task, and the necessary computing power required to accomplish aggregating all these different data elements can only come from a technology partner with the breadth and flexibility like Intel.

The exciting part is that we can then further analyze the success of these treatment outcomes and determine whether we can apply these different findings to a cohort of patients or a patient population who might show similar symptoms or a similar makeup to our individual patient.

Doing things like that, those have direct ramifications towards population health and ultimately preventative medicine. These are just some of the exciting things that we're looking to lead our

customers to in a new world of healthcare, again, driven by digitalization and powered by a strong technology partner like Intel.

Tim Crawford: Are you thinking that things like population health and precision medicine are two of the somewhat emerging areas, something that people have wanted to really go after, but have really been challenged mostly because of data and technology and then, of course, policy comes into that? Do you think those are areas that we could look to as future improvements or innovation coming from Siemens and others?

Peter Shen: Yes, absolutely. I think we really do want to get to this broader picture and drive towards population health management here and really move from this reactionary state that we're in for healthcare where we're trying to diagnose and provide a treatment plan after something bad has happened and move towards this concept of preventative medicine here and really trying to see, how can we take the findings and the learnings that we have had from these different treatments that we've prescribed and can we apply that towards patient populations? Can we apply them towards a cohort of patients who have similar, let's say, genetic makeup and try to do something that's preventative or prevent something that might happen in the future for them?

Another area that Siemens is really looking to leverage beyond this concept is, can we create, if you will, almost like a digital twin of a particular patient? Can we assimilate all this data that we're gathering about a particular patient, all this laboratory image data, genomic data, physiology data, and now combine it with maybe some more physical and mechanical data elements and actually create this concept of a twin, a Bitmoji, if you will, of the particular individual here but now actually use this twin to be able to test potential therapies? If I have a patient who might be struggling with, let's say, a particular cancer, can I create a digital twin or replication of that same patient and then now run different therapies to try to figure out what is the most optimal therapy for that individual patient? Since I'm doing this all in this virtual or digital twin environment, I can take those learnings and I can continuously improve them by either real-world outcomes when I do the treatment on the individual patient themselves or in this virtual world as I try out different therapies in this digital twin. This is a real exciting area for us and, again, this is where the value, all this data that's being generated here and aggregated and accumulated, this is where we see a lot of great potential. But again, it all requires having some great and flexible processing capabilities and this is why we're excited that we're working with Intel on that.

Tim Crawford: That's great. Let's move on to our Q&A section. Our first question is really geared around what we've been talking about in the last couple of minutes here, which is, are there certain areas of medicine that are advancing faster than others due to technology and if so, why?

Peter Shen: Yes. This is a very interesting topic here because I think in general, healthcare has always struggled to embrace technology. I think just because there's a lot of concerns in terms of regulatory aspects, data, privacy aspects, sensitivity of the data itself here. But I think what's really changed things a lot, in my opinion, is also the patient aspect of it, the consumerism aspect of it, where patients now and folks like you and I, we're very comfortable with the technology. I think that's really forced providers

and folks who are involved in healthcare to now start to say, hey, we've also got to embrace technology as well. There's certain areas where that embracing of technology is happening faster than others, I think, again, in the concept of data and data processing, things like generation of data and applying technologies to x-ray machines and CT scanners and everything. That's been well accomplished. I think where it becomes more challenging again is now trying to use that data to do more predictive-type medicine, preventative-type medicine areas. This is where we're just starting to see the ramifications of technology in that area. That's an area that I think is going to start to grow here in the near future. Again, more complex here as we deal with more data elements, but one that I think has a very significant future for us in healthcare.

Tim Crawford: Now, that's great. I could go on just asking questions about what you're talking about, how much does generational population come into it from a physician standpoint, clinician standpoint, how technology evolves. But I want to get to another question first, which is, what is the future of AI—specifically AI in healthcare? How do you see it evolving over the next three to five years? You talked a little bit about this as part of our conversation, but could you come back from it a little bit and say, okay, so let me look at my crystal ball. Where could it really play a role and maybe where it doesn't?

Peter Shen: It's a very interesting topic. Artificial Intelligence right now, especially in the healthcare space, is all the rage in our particular market and folks are quite excited.

We talked about technology adoption. I think AI is an area where we're seeing a lot of folks try to jump on the bandwagon here and could actually have some significant changes for us within healthcare. At Siemens here, we see AI at different tiers, if you will. There's different levels of complexity in this hierarchy of AI, especially for healthcare. We talked a little bit about it just now in terms of leveraging AI to do the simple tasks, which would be just identifying and characterizing anatomy, for example, and being able to train algorithms to recognize: this as a shoulder and every time I look at this particular x-ray image, this looks like the same shoulder so it must be a shoulder.

What some vendors have done including us here at Siemens, we've leveraged that pattern recognition capability and built that into a lot of our imaging equipment, x-ray equipment, to try to optimize and make those pieces of equipment more efficient so that they recognize when a patient is laying there on the table, then: this is the patient's shoulder. It will then automatically, let's say, position that CT scanner or MRI scanner around that shoulder. That kind of pattern recognition within AI is something that's very practical.

One could also argue it's a little bit simple, as well, just recognizing a pattern and then moving forward. Once we start climbing this hierarchy, the next step would be really to say, well, if I can recognize things, can I maybe draw some conclusions from them? Can I start to diagnose, use those—if I can recognize certain ailments or diseases, can I start to draw a particular conclusion towards them? Can I help make a diagnosis based on that information? That's where things like the AI-Rad Companion that I had mentioned earlier, is where we're trying to push the envelope a little bit. To really aid the physician with additional information powered by AI to help them draw the right diagnostic conclusion. A little more complicated there.

Where we think things are really going to take off for AI is really once we start applying it towards the individual patient. As we talked about earlier, if I can now leverage AI to assimilate different sources of data about a particular patient and use that information to create this individualized therapy for this patient and then maybe do some predictive analytics on that to say this certain patient who has this type of genetic makeup, and has this type of laboratory results, they would benefit the most by having treatment X versus treatment Y. Leveraging AI to do that is where we see a lot of excitement and a lot of possibilities there. Leveraging AI and the computing power behind AI to help us draw clinical decisions for treatment is an area that we're very excited about. Then finally, as we talked about, can I then take those results and apply them to a cohort of patients? Can I apply them towards other patients who might have a similar makeup or similar ailments?

If it was successful with this patient, can I draw similar conclusions for now a population of patients? This cohort analysis type of aspect within AI is one that we really see a lot of potential and a lot of promise for as well.

Tim Crawford: You mentioned the physician and how they are leveraging AI and the next two questions are somewhat interrelated. But I wanted to get your take on a slightly different version of the question, which is, have doctors fully embraced AI into the clinical routine, and conversely, have patients adopted technology and AI? I guess my question to you is somewhat related to bringing these together and how do they experience AI if you're a physician or if you're a patient? Where does AI show up in the experience for the physician, or for the patient, or both?

Peter Shen: Now, this is a very interesting topic in itself as well, Tim. As I mentioned earlier, healthcare, in general, has been slow to adopt technologies. To a certain extent, we're seeing a similar experience as it relates to artificial intelligence, because I think, in particular from a clinical adoption standpoint, this is a challenging area right now. I think what a lot of folks tend to forget is that these clinicians, they have been practicing medicine for a long time already without AI, so they know how to diagnose certain ailments. They know what the proper treatment is for somebody who might be suffering with a long-term illness.

Based on experience, based on their clinical training, they know what the right answers are. Now you're introducing AI here, and I think there was initial overreaction where people were saying now we don't need these clinicians because the computer will figure this all out. What the reality is, is that the clinicians have realized that this additional information that the AI provides is helping them build their clinical confidence. What does that mean? They're still the ones making the diagnostic decision, they're still making the right therapy recommendations, but now they're doing it more confidently because they're getting exposed to greater amounts of information that are relevant to what they're looking at. That's the big significant benefit for them from an artificial intelligence standpoint. It's not the sheer fact that AI is actually doing the work for them, but it's the sheer fact that AI is identifying and bringing to their attention the relevant clinical findings that they need to look at. That's how it's really impacting the clinician from his or her perspective.

Now, for the patient, it's a little bit different because as we touched on it earlier, the patient really has been a driver of technology within the healthcare industry because the patient, folks like you and I, we're all very comfortable with technology. We started to put a lot of trust into the technology itself, and that's really driven providers and others involved in healthcare to really have to work very quickly to become more digital and to embrace technology more. You're seeing now patients who are now more informed in terms of what's going on with their healthcare before they even engage with their doctor. You're seeing patients that are doing their research and trying to understand more before they're actually following up with their treatments. This connectivity though brings some great benefit because, again, as we talk about all this data sitting in all these disparate areas, having patients that are connected and are able to provide their clinical data back to their physician in easy manner is helping the clinician make those right treatment decisions for that patient. Technology and the patients' embracing of technology has really helped advance healthcare and our desire to get to more accurate and more precise individual treatment for that patient.

Tim Crawford: As you think about trust of data as well as just the patient population getting more and more comfortable with technology, do you think that will continue to change?

Peter Shen: I think so. I think it's really going to continue to drive our industry quite a bit. I think you'll see more and more informed patients. You're going to see a stronger desire from providers and even payers to have a better understanding of all the data that's being generated here from all these different sources, and I think you'll see a very data-driven healthcare environment here. Still leaving autonomy for diagnostic and clinical decisions, but again, more informed decisions based on all this information that's forthcoming.

Tim Crawford: That's great. Peter, I want to personally thank you for sharing what you're doing at Siemens Healthineers, you and your team there. Absolutely fascinating. I also want to thank the audience for participating in the questions. Mary, I'm going to turn it back over to you to wrap up this webinar.

Mary Killelea: Wonderful. Thank you, everyone, for joining us. Look for future webinars with our wonderful customers. Have a great day.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.