



HOW DIGITAL TWINS POWER INNOVATION

AUDIO TRANSCRIPT

Scott Gregg [00:00:00] And now, with the introduction of digital twin, we've now connected the Plant four with the capabilities of AI and ML to proactively assess issues and make recommendations on how to fix them before they ever happen.

Teresa Tung [00:00:19] Hi, welcome to another AI Leaders podcast. My name is Teresa Tung and I'm Accenture's Cloud first chief Technologist, where I look at innovations powered by the cloud. I'll be your host for this session on how digital twins are so important for driving innovation. I'm thrilled to be joined by two experts who will share their experiences implementing digital twins for the factory. First, let's welcome Scott.

Scott Gregg [00:00:43] Sure. Thanks, Teresa. My name's Scott Gregg. I am the global digital plants director for Mars. Wrigley. Been at Mars for approximately 25 years and excited to talk to you today.

Teresa Tung [00:00:57] And let's welcome Richard.

Richard Weng [00:01:01] Hey Teresa. This is Richard Weng. I am a part of Accenture Cloud first as well. I'm managing director here and I've been supporting Scott and the Greater Mars team on this digital twin program for the past three years.

Teresa Tung [00:01:12] Thanks both for joining us. We're going to talk about digital twins and

specifically how they power innovation. The low hanging fruit for digital twins is driving efficiency. But digital Twins is about enabling more. It's about finding new, innovative, more collaborative and even more intuitive ways of doing things. It's innovation that results in new processes that are cross-functional and even cross partner. And so, Scott, maybe we could start with you. Could you share some of what you're doing with digital twins at Mars and how it relates to innovation?

Scott Gregg [00:01:43] Yeah, sure. At Mars, we're leveraging the digital twin to solve some of our most complex business and manufacturing challenges. And up to this point, the plant four has been a bit of a black box. Data really wasn't readily available. Plant and business networks were not necessarily connected. Engineering was at the forefront to solve some of these traditional challenges. And now, with the introduction of digital Twin, we've now connected the Plant four with the capabilities of AI and ML to proactively assess issues and make recommendations on how to fix them before they ever happen. The twin allows us to use and see data in real time to help us reduce non-quality costs and increase capacity. So as for innovation, it's now pushed our plant four associates to look at solving problems in a very different way, providing them with a toolset that they've never had before and with a different way of thinking. So as far as innovation goes at Mars and the digital twin, it's been a real step change in how we're trying to solve complex problems on our plant fours



Teresa Tung [00:02:53] So it sounds like the innovations resulting in new processes that might be more cross-functional and even cross group, right?

Scott Gregg [00:03:03] Absolutely. You know, I'd say traditionally we never played on the plant floors. So, you had your engineering teams and you had your controls, engineers, etc., fixing those problems. But now with the introduction of the twin, we've had to go across engineering, traditional I.T. functions, networks, servers, cloud hosting, you know, so all these different groups are now coming together to solve problems on the plant floor, which we've never done before.

Teresa Tung [00:03:34] So Scott can you give us an example of what you're doing with the digital twin? What is the digital twin at Mars look like?

Scott Gregg [00:03:40] The Twin at Mars is really about gathering plant floor data by implementing I.O.T sensors at various points in our process and in packaging in order to use that data to solve some of the problems. And I think when I think about the use cases that we've gone after, it's in becoming more efficient in our packaging process or how do we become better at right first time and producing chocolate to energy management and things of that sort of how do we best understand how we're using our energy in different areas of the factory floor? So, I think we've got lots of opportunities that we still haven't figured out, but then we also have several that are focused on specific areas within our process and packaging on using that real time data. It's pretty broad, I know, but at the end of the day, I think it's one of those things where depending on the problem, it really dictates what kind of information you need off the floor and then what kind of prediction you can do with the AI in order to help. But the twin is also acting as future knowledge, where the workforce of today doesn't necessarily have 25 years worth of experience of how to make chocolate. And as you're trying to fight for talent and bring new talent into these roles in order to make chocolate or to set up a packaging machine. Not

everything is always written down, so the twin gives us this ability to collect that information. And house knowledge. So, when you have a new associate or new someone joining. They don't necessarily need the 25 years worth of experience. They can leverage the experience of the twin that's giving them the answer to the test, if you will.

Teresa Tung [00:05:32] So digital twins are also being used to identify new opportunities, Right? And to validate the benefits. So, continuing with Scott, How are you using digital Twin as part of an approach to identify and validate these new opportunities and then to scale them?

Scott Gregg [00:05:48] Yeah. So, we've come up with a, I'll say, a standard process of how we want to identify the issues and then look to solve the issues and then scale. And that's been in close partnership with you guys at Accenture. And really the impetus is going to a factory and understanding what a problem is that they have that they haven't been able to solve. In order to do that we've taken a core set of internal associates, Accenture, etc., to do a deep dive into those problems, understand where there's opportunities to leverage new technology, and then come up with a hypothesis of what we can address before we ever even embark on doing something. Once we feel like we've got that right information at our fingertips and we understand what an addressable challenge is, we then look on how do we scope it out with the technology and the AI and ML in order to actually solve it at that initial site. And assuming we do solve it and we see positive results on solving those issues, we then look across the network and understand where can that same solution be applied to different factories or similar situations at other factories that are facing a similar problem. So, it's pretty methodical, but I think it gives us the right intent and not to just spin up a solution that can't be scaled across the network.

Teresa Tung [00:07:07] And that's a great foundation for this incremental build of the digital twin. Right. So, one, it's it sounds like



you're de-risking, you know, the new additions because you have this digital twin that has the data needed to really identify the possibilities and quantify its value before you do anything physical. And then you mentioned, second, the ability to scale, to take something that's proven to work and to identify all the other places that it could be applied using the digital twin itself. Have the next question for Richard. Right. So, along this sort of incremental build, how do we build up the twin to get increased data functionality? Did we sequence or get an order of the projects? You probably don't have that visibility day one.

Speaker 3 [00:07:51] So we look at it really in three factors and they all contribute to increasing momentum and increasing our ROI. So, the first one is really targeting to make sure that we have the right use case or the use case itself has tangible value and we're able to go in that direction. The second thing we look at is around making sure that the underlying digital twin capability that we're building is useful for that use case as well as scalable, kind of like what Scott mentioned already. And the third thing is around really the cost of implementing these additional technical capabilities in that it is reasonable in cost and that we're not kind of building something too complicated too fast. So, to give you an example, when we looked to scale our first use case around packaging, the big need was now expanding this one use case into multiple plants. So, the first thing that we started doing, the first kind of core digital twin capability we started looking at is how to abstract, the complexities of plant integration. So that's an example of the first component. Then as we kind of move forward, we started looking into more kind of real time use cases and edge computing use cases and things like that. And that's where we started building additional faster kind of processing modules directly on the platform, on the edge. And as we kind of move even further from that, we wanted to provide the end user, or the operations associates directly a way to quickly get access to data and get kind of these insights. So, we started enabling these

capabilities that allows us to onboard new devices quickly. And then finally, as we kind of reached this maturity of multiple plants, new data streams and things like that, we started looking into how to contextualize data better, given that unique data sources that you see in different plants. So that's a bit of an example of kind of almost the sequencing in the start of our roadmap, right. And how these capabilities all build onto each other and how we're able to tackle incrementally more complex use cases, hopefully and ideally at a lower cost point than we would have been able to if we started a different order.

Teresa Tung [00:10:07] Right. So you're going to start and then as you go, you're adding more functionality and more data and then that therefore gives you even more capability to identify new opportunities and build on that digital twin. And it looks like we can start small with some of these, you know, improving efficiencies and then start tackling some of those bigger, more futuristic capabilities around sustainability or automation. So, it looks like that sort of muscle memory is what you're developing. I think part of that is the digital twin, but it sounds like a lot of this is also about collaboration. And Scott, you mentioned about maybe the importance of having different parts of the organization. Maybe IT, OT, the business, you know, coming together for adoption. So, could you maybe talk about how you need to bring those parts of the business together for adoption value and scale?

Scott Gregg [00:10:59] Absolutely. Connecting the different areas of our business is extremely important for adoption. With our twin initiatives, we've had to partner with internal functions like E.A, networks, cybersecurity, cloud, compute, etc. that I mentioned earlier. Not to mention segment leadership, engineering, R&D, plant directors, value managers, local O.T., and that can go on and on. But I think when you think about how complex the stakeholder map is of the different people that are involved and need to understand from the very beginning, no one



had an idea what a twin was. So, I think setting that foundation of what a twin was and what it could do for them was really important. No matter if they were from the business side or the technology side of just really getting a level setting expectation of what a twin could do. Then when you start to get into the actual heavy lifting and you're talking about linking the I.O.T Sensors and the plant equipment out of the factory, we'd never done that before either. So, then you get into even another layer of just the capability to connect into the factory floor and build trust on the factory floor that we're putting something in that's going to help them become more efficient. This is not about taking away their job. This is not about reduction and headcount, but it's trying to solve complex problems with our operators who are operating the equipment in their factories. So, setting up that critical communication, change management, working with the operators on the adoption is critical to make sure that it is being adopted and that it's not just seen as another worthless tool that we're trying to use flavor of the month or whatever, and trying to help these guys. I think the true test, though, was the results. So, you can do all the change management. You can tell people what it's going to do, but when you start to see the results, that's where the true adoption started to come through. When the operator on the floor felt the difference between the recommendations that a twin was making and how it was helping them make their job easier. So, it's all great to do all the upfront stuff, but the proof is really in the execution and making it happen and then seeing the results.

Teresa Tung [00:13:20] So my big takeaway there is the twin is also this organizational and culture shift. It sounds like that what you just spoke about with the, you know, the IT, OT Working together and then also with the person on the factory floor really having a trust in the digital twin and then being able to develop their own use cases. It sounds like that's actually one of the big shifts in addition to some of the technology that we talked about.

Scott Gregg [00:13:46] Absolutely. And I think the other interesting layer that came into play was the way that we are feeding the twins. Some information was through the operator. So, the AI was actually learning from the operator. The operator was getting predictions from the AI, looking at them and assessing whether they felt they were right or not. And if they weren't right, what would they have changed? So that feedback loop back into the AI and allowing it to learn and evolve I think was extremely important. So, the operators also felt like their opinion and their knowledge that they've had from 25 years, 30 years of working on the particular machine. It was actually being built into the model and helping it evolve and become better at its prediction. So that interaction I think was really important in adoption as well. It's almost like a piece of them in the solution.

Teresa Tung [00:14:42] Accenture, we just released a report on innovation where we talk about breakthrough innovation and it really sits at the intersection of understanding the potential of next generation technologies like AI, metaverse and cloud, and then applying them in novel ways. And so, in this way, the technology itself is so game changing that it's able to shape and capture new whitespace opportunities. And we really believe that companies can engineer these breakthrough innovations. And so, you know, as part of the digital twin. So, Scott just talked about, you know, a role about the human really augmenting some of the maybe gaps in the data and really being able to enact on the capabilities. But technology also plays a role. So, I have a question for Richard. How do we keep up with these new technologies and capabilities from creators and how do we help orchestrate how these new technologies fit into meaningful solutions.

Richard Weng [00:15:38] As kind of partners with Mars we continuously scan the market and scan promising technology vendors for innovations that we can help apply into the Mars



digital twin kind of case and program. For example, whether we talk about new data and data contextualization technology such as knowledge graph or we talk about kind of data labeling technologies and things like that, those are things that we regularly kind of bring to bear in terms of discussions and implementations and pilots and POCs. There is a basically a innovation kind of track and innovation funding mechanism as part of this bigger program that allows us to jointly take risks and allows us to basically try out new technologies and more importantly, apply them to... in a way that's meaningful. And by meaningful, I mean whether it's something like a knowledge graph, we have to we have to make sure that if you apply this new technology, then it's actually driving, driving benefits for the user. So, for example, in that case, we were toying with creating this Google search like environments, right? For example, for the manufacturing plant that allows a plant operator to ask kind of questions and immediately get a response back, allowing them to sort through, you know, the hundreds and thousands of different data points, but really give a clear and crisp response back. Another example where that's kind of on the horizon for us right now is looking into ways that allows us to basically quickly leverage camera video feeds, but quickly having a user label them by themselves and identifying the problems and really getting that and covering that into anomalies. That's useful from an operations standpoint and correcting these issues. So, I think I think overall it's about continuous scanning. It's about also kind of our commitment to making sure that as we implement these new technologies is actually fundamentally useful for the operators and therefore kind of driving this ROI and this kind of value led story and mission that Scott talked about previously.

Teresa Tung [00:18:02] I love the example about using a almost web search like experience for these plant operators, because I'm sure that, you know, anybody has done web search or when you talk about data labeling, it's almost like

captcha, like when you have to prove you're a human, you're like labeling these images of traffic light. So, it's taking things that are really engineered to the end user or to making a meaningful decision. And you're using some of these new technologies that have been proven in other, you know, industries and applications and applying it now to the factory floor. So that's a really great, you know, making of a match using the digital twin and finding innovation opportunities. I have a question for Scott. Right. So, we just talked about all the things twin can do, but what is your recommendation for someone getting started with the twin?

Scott Gregg [00:18:51] I think the first thing I'd say is developing and deploying a twin is hard. It's not easy. Many organizations are not set up to be successful given the way they've traditionally worked in the past. So, this is... This is something very new and different. I would say for many CPG companies, it's essential to get your senior leadership alignment on what a twin can do for their business, so they understand it. I think it's essential to start small but go fast and define what the value is upfront, whether it's a reduction in the N.Q.C, a capacity increase, increases in O.E.E, really make sure that you define what success is upfront so you understand what you're trying to work towards. And then I would say make sure to engage with your digital, with your internal digital teams. And cybersecurity data privacy is essential in today's world. And without those key linkages into some of the backbone functions within I.T and making sure data secure and that there's no risk of it being leaked, that if you don't have those pieces in place, you're going to make it a lot harder for you. Make sure you can pick a strategic partner that can bring skills and knowledge and scale that you don't have. So, if you if you're trying to do something like this on your own and you may have data science teams, etc., within your internal capabilities, I think the value in picking a partner like Accenture really gives you that scale opportunity and brings in knowledge that you don't have in-house. They can unlock



opportunities that maybe you wouldn't have seen, really becomes a partnership in how to solve these problems together. And then I guess maybe finally, the one last thought that I've gotten in the back of my head is don't be afraid to fail because it's going to happen. We've hit several bumps along the road, but I think we've...We failed fast. We've learned from it. We've implemented changes in the process or how we've tackled certain issues or how even we assess issues and that's allowed us to move faster with more success and in subsequent use cases that we've looked to develop. That's a lot of words, but I think in general, it's a tough road, but it's very rewarding at the end when you see the end result.

Teresa Tung [00:21:08] Let me see if I got that. Scott So the top top level buy in.

Scott Gregg [00:21:12] Yep.

Teresa Tung [00:21:13] Need the agile to be able to fail fast or get value at scale quickly.

Scott Gregg [00:21:19] Yep.

Teresa Tung [00:21:19] You need to use it in a way that develops some of what I was calling muscle memory, what Richard was calling incremental capabilities, things like the security, you know, getting the workforce on board, like adding more data, more data science, and then having a partner to do this together with so that we can really bring together expertise both across the business and across that ecosystem.

Scott Gregg [00:21:44] Yeah, I think you summarized it quite well.

Teresa Tung [00:21:46] I was paying attention. So, Richard question, what does the future hold when we think about digital twins?

Richard Weng [00:21:53] I think I mean; I can't say what the long term future holds right, but in the short or even immediate term or intermediate term, we're looking at least from a manufacturing standpoint, you know, shortages potentially in labor as well as, you know, tenured kind of experts and operators really retiring. So, a big, I think, thought in the front of our minds is how we better capture that tribal knowledge. And then also what we need to enable towards this path to automation. So those are really the two things that at least we're trying to step forward or we're trying to kind of head towards. And in doing that, a lot of that comes down to how we're how we're going to be able to extend these capabilities to contextualize data faster, for example, and how to basically enable more flexible simulations that allows us to predict what's going to happen during unforeseen events or making some drastic changes to certain designs and things like that. And really predicting what the outflow or the keep guys would be. And all of that is in service to enabling more of a hopefully autonomous environment that allows us to alleviate some of the labor challenges and kind of the expertise challenges that we may really be heading into.

Teresa Tung [00:23:16] So maybe the beginning might start with maybe see the same thing. I can see what's happening and some of what you're talking about goes even beyond. So, what happens if this continues to happen? You're talking about really what if? Like What if I change things completely using a digital twin before I do something physical? Or what if I do things differently with different labor mix, then more automation? So really sort of, great sort of buildup, right? You don't start with that future day one, but you build in some of this capability. So I want to say thank you to Scott, thank you to Richard for your...sharing your experiences with



digital twins and how it's powered innovations through to scale at MARS.

Scott Gregg [00:24:00] Thank you for having me.

Richard Weng [00:24:01] Yeah, thanks for having me as well.

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