



EP. 59: REVOLUTIONIZING MANUFACTURING WITH AI: A VISIONARY JOURNEY

AUDIO TRANSCRIPT

Ibrahim Al-Syed [00:00:00] So it's fundamentally important that we leverage and complement ourselves with AI so that we can create and turn the dream into a reality.

Scott Tvaroh [00:00:16] Hello everyone. I'd like to welcome you to the next edition of the AI Leaders podcast. My name is Scott Tvaroh. I'm a managing director at Accenture within our Industry X group, and I have here as my guest today, Ibrahim Al-Syed, who is the director of digital manufacturing at Celanese. Welcome, Ibrahim. Would you like to introduce yourself quickly for the audience?

Ibrahim Al-Syed [00:00:41] Yeah, thank you, Scott. Happy to be here. Yeah, I'll give you guys a little bit of my background and what do I do here in Celanese. So, I'm leading the digital transformation for Celanese in manufacturing for all our facilities globally, which is about 50 across different countries, regions and continents. We've been doing this for about two years at Celanese and one of the exciting things about this journey is that, you know, my background is, I grew up in process

engineering, chemical engineering in the plant and the refineries and chemical plants, and then found my way from refineries all the way up to here and now leading digital, which I'm very passionate about as I have been the person in the plant really supporting the facilities, optimizing the facilities and in today's world, where we have technology available to us and our fingertips, it's really a game changer opportunity for us to leverage it and see how we can operate our facilities differently. So, excited to be here and excited to dive into the details of this program or this podcast.

Scott Tvaroh [00:01:49] I'm very inspired being part of this program with you. Maybe we can start out by a quick question. What inspired your initiation of your digital manufacturing journey at Celanese? And could you elaborate on the thought process behind the motivation of steering towards AI, towards an AI implementation?

Ibrahim Al-Syed [00:02:09] Yeah, that's a good question. So, the way we got started in Celanese around the digital transformation was really around taking a



step back and thinking about, you know, what do we want to do as a company when we grow up in the next 15 and 20 years, right? What is that aspiration and vision and dream for us? Right? And we really put some thought into thinking about what kind of operating model and business capabilities we needed and, you know, from 10 to 15 years out, and what we really started thinking about ourselves is that we want our facilities to be, you know, predictable. They need to have remote and autonomous capabilities. We want real time optimization, self optimizing capabilities or facilities. But at the heart of this, what we were really trying to drive towards was how do we empower, optimize and inspire our people that every day in, day out, we're producing the maximum value and driving significant efficiencies in our operations. And from that we started really thinking about, okay, how do we take this dream and this vision and then turn into a reality and started working towards, you know, our roadmap where we were really not thinking about, you know, how do I get, you know, this incremental value by implementing this one tool or one use case, but really looking at holistically, you know, we have this vision and dream that requires a certain amount of business capabilities and a certain way of operating. What foundational capabilities do I need to plan and invest and implement today so that I can be set up for that kind of vision in the next several years out. And that's how we started in the journey and really started building believers in Celanese. So start looking at it not from an incremental transformation value, but really from a transformational point of view.

Scott Tvaroh [00:04:21] That's awesome, Ibrahim. So, maybe a follow on question from that. So, why was, why did you feel it

was important to create a data and analytics foundation to drive this journey?

Ibrahim Al-Syed [00:04:33] Yeah. So, that's a really good question. So, you know, if I just expand upon, you know, the vision that we had, one of the fundamental things we started thinking about is what are some of the foundational capabilities that I'm going to need to get to that vision, right? And one of the things that became very evident to us is regardless of what use case we are trying to do, or what vision you have, at the end of the day, your value proposition for this vision lies in the data that you create, propagate or use to make decisions, right? And you need to have a foundational platform or a foundational, data foundation or data analytics platform when you, where you can start creating a solid foundation of data. So, the way I think about it, it is, it's like this. So if you have, if you think about a dream home, for example, right, a mansion or whatever you dream of, one of the things, the first things you have to do is dream it, have a, have a vision architected on a piece of paper, and then when it comes to executing it, you start thinking about I need a concrete foundation first. And a concrete foundation is then, then allows you to build the house you dream and it also gives you the flexibility of putting different rooms, dining rooms, you know, living rooms and what else. Right? So, when you take that analogy and you think about the way we're doing it and Celanese is, for us that foundation is that digital platform, and that digital platform has the plumbing for the data that's coming in. And once you have that, you know, ingested, contextualized and



modeled to create the foundation that you need to build your home or build your dream, and you can do it over a couple of number of years, you know, as time allows you and gives you the flexibility to put these Lego blocks together to create the vision that you have. But what that does is that everything that you're building on top of the platform it's fitting in the right place. Everything is connect, everything is modeled in most optimal manner. If you were to do it without that and you just went out and bought one tool, implemented it, you know, point solution or developed one use case, you could think of it as building a home like in pieces. You build a foundation, you build a room and you build a roof, and then you build a one next to it, and then you get another one next to it, and you're going to get this foundation that's shaky and it's not going to be very solid or you won't have a very stable home. So that's kind of how I look at the analogy and in order to do this transformation, it is very important get a platform, get your data in, get it, you know, connected, get it contextualized, get it modeled to represent your physical plant and then you'll have a tremendous amount of opportunities to build your dream version.

Scott Tvaroh [00:07:36] That's awesome. And I like the analogy of the house, Ibrahim. One kind of follow up on that is, yeah, you think about a lot of people have discussed having a data foundation, whether it's a data lake, whether it's a graph model, whether it's a digital twin. What do you think is different about what you're doing at Celanese that's enabling you to get beyond what I call pilot health, right? How do you get beyond MVP's and look to scale like you're doing in Celanese?

Ibrahim Al-Syed [00:08:05] Yeah. I think

the one of the key differentiator for us in our program was that we, when we started our journey, you know, we did do a pilot at one unit and one facility to prove out value and prove out the concept. But we were quickly, you know, on the way to scaling it and the way we did it was not, hey, I have this use case or I have that use case, and I'm going to, you know, now start looking at what data ingestion do I need, what graph model do I need. We went very generically saying hey, I have all these core systems and core data sources and capabilities in our facilities, we need to liberate those silos, bring them onto the platform and do it across all 30 plus facilities for Celanese, right? So that we can start modeling the data to represent, you know, each and every single of our facilities as one digital representation. And for that you don't have to worry about, you know, siloed use cases, but what you really have to think about is how can I build, you know, I call it a digital representation or a digital twin of how your facilities look today, but leveraging it by data, and that's one key thing that allows us to go fast, because you can go very fast in terms of putting together an execution team, you know, and say, okay, I'm going to take my CMMS data, I'm going to take my time series data, I'm going to bring it all onboarded onto the platform, I will start contextualizing it with what we know on how our facilities operate and what no data models do I need, and then that immediately sets you up for acceleration and use cases and digital capabilities, right? So that's sort of the approach we took that also gives us a lot of efficiency in how we execute this program. If you do it differently, sometimes, when you start doing use cases, you then figure out, you know, one by one what I need and what I need to put on the platform, you're always in an iterative rework cycle and the platform is just evolving over time at a much a slower pace, your use cases take a long time. Our objective was how



do we decouple that, build the foundation first, onboarded indiscriminately all the data and then start accelerating the use cases.

Scott Tvaroh [00:10:33] You make everything sound so easy, Ibrahim. Sitting underneath, I know, it's a lot harder than the way you're describing it. Hey, maybe we can shift a little bit. Why is AI important in the realm of digital transformation for individuals and organizations aiming to stay competitive and realize potential benefits in today's ever changing technology landscape?

Ibrahim Al-Syed [00:10:55] Yeah. Good question. So, you know, why is AI important really ties back to what, you know, our vision and aspiration is, right? You know, when earlier when I talked about, you know, we want remote capabilities, we want autonomous capabilities, we want self optimization, we want predictability in our facilities. The only way to do that is, efficiently, is to leveraging AI, an artificial intelligence, right? And the way to think about this is that we're trying to build a digital transformation vision, and it's our dream and aspiration, and as a value proposition that's tied to for the company. Right? And you want to do it in the most fastest and cost efficient manner. And what that means to us is that you have to leverage a significant amount of compute and intelligence to execute, you know, models and algorithms that drive you a run in your facilities in by exception, right, whether you're optimizing them, whether you're predicting them, whether the steel in the facility is talking to you somehow with data, the only way to do that out of your fingertips in real time is by leveraging AI.

We as humans don't have the compute, and we cannot compute. We cannot compete with the compute available to the machines and the AI algorithms, right? So it's fundamentally important that we leverage and complement ourselves with AI so that we can create and turn the dream into a reality. There is no way for us to become predictable and autonomous without leveraging AI, right? We don't have the manpower to do that, we don't have the processing power as humans to do that. So that's to me is quite foundational for the vision that we've set up.

Scott Tvaroh [00:12:52] Yeah. No. Well said, Ibrahim. One thing not to look past here is that this isn't all about technology doing your digital manufacturing journey, right? It's a, there's a lot around the people. So what role do the people play with the implementation you're doing of digital manufacturing?

Ibrahim Al-Syed [00:13:09] Yeah. So one of the, I would say, significant centerpiece of our digital transformation strategy is what I call human centered design. What we didn't want to do was, and again, it goes back to, you know, how you execute your digital transformation strategy. You could, you know, alternatively go down processes, you could go down use cases, you could, and then work backwards from there. What we really wanted to do was build and design our digital tools and technology around our people. What that means is that if you have an operator role or a front line process expert in a facility, that person is involved in multiple processes, multiple roles at a facility as he or she does that day in, day out. If you go by a process like maintenance process, use this technology, you go, you know, reliability process, use this technology,



safety use something, it all converges under the same rule. So how do you architect and design a digital tools around this role where we optimize, inspire and empower this role day in, day out. Right? So for us it was understanding the operating model, understanding what all these processes and roles people do in their facilities and working backwards to figure out how you're going to build a digital ecosystem around this role. And for that it became very clear you need to have a platform architecture to support that, right? Instead of siloed tools that you throw at people that don't connect, that don't propagate data easily, you know, you might have a leak happening in a facility. You know, the operator has to open up a CMMS system, and go to a shift log system, and then go to all these other tools, and one event can generate a whole bunch of churn, right? So from a people's perspective, being number one priority for us was like our starting point is, you know, understanding your operating model, understand how what roles do and then build a solutions around those roles to make sure everything is integrated, everything provides the most optimal user experience for these roles, and that's important because if you have a good user experience, people will use the tools and generate the value and if you don't have good user experiences and you don't build good digital capabilities around the roles and around the people, then you know, you end up creating a lot more inefficiencies than just using paper, pen and Excel, right? So, you know, we also sometimes talk about, you know, tools need to be as simple as get, taking up a piece of paper and writing on it, right? It's still a journey for us. But one of the fundamental things we have to do is what I call user research, understanding what kind of designs we need to build. And it's very similar to if someone wants to build a product in the market, you

need to do customer research, you need to market research and as corporations like us, we have to do the same internally for our transformational journey.

Scott Tvaroh [00:16:23] Yeah, Ibrahim. A lot of people actually do talk about doing, improving user experience and, and user design. I think you can bring it to life even more talking about what you're doing with the Champions Arena and, you know, Celanese is really focused on innovation as a company, and you're bringing that innovation into the manufacturing area and inspiring the workers to work differently by bringing these tools and maybe talk a little bit more about what you're doing on that front, enabling the worker.

Ibrahim Al-Syed [00:16:53] Yeah. So, one of the things so if you really think about the number of things we're working on in terms of, you know, enabling our people is okay, it starts with first having a good human centered digital design. Second is having, you know, product ownership, right? So the other thing that we're also, you know, leveraging is we want our digital solutions to be by the people, for the people, with the people, right? So we are very, driving where people from sites from different facilities take ownership in driving the digital solution builds. The third thing we're doing is building out champions. You know, what we would call digital champions in our facilities that, you know, are digital savvy folks that are driving and taking ownership of solving citizen use cases, leveraging the tools that are made available for our data is now accessible. They can build their own analytical dashboard, they can access data, they can build their own solutions. We're also creating, you know, we're also investing time and energy on communications. We've just rolled out over the last year or and a



half, we've been working on a monthly magazine that comes out and then communicates, you know, where we are in the program, user stories, stories from the facilities for the people, what's coming, what's available. We also have a network we've set up globally for people to come and share their use cases and stories. So a lot of things are put in place. We have office hours set up for facilities to come and check in and get help. We are trying many things to help with the change management journey, right? So, last two years was for us to build the foundation and now this part of the year and the next coming years are going to be about how do I now let the people come into my home and direct them into the home and start using it and start leveraging the technology and start driving value and use cases.

Scott Tvaroh [00:19:05] Yeah, keeping along with that analogy, I think we're now furnishing a beautiful house that you've built, Ibrahim. One thought maybe as I think about this, you know, it's an incredible journey compared to what a lot of other companies are trying to do. You guys within two years from a new start where you began this journey, you've built this house, this platform and enabled 30 facilities globally, it'll soon be 50, right? Into this house that you're now furnishing. Maybe can you share with the audience some of the lessons learned that you've had over these past two years?

Ibrahim Al-Syed [00:19:47] Yeah. So, one of the most important lessons for us is that don't try to do it alone. Right? It's important that you leverage a partner ecosystem that helps you accelerate this and brings the learnings from the industry, and allows you to have the resources that you need to do

this kind of journey, you need to have executive sponsorship, right? Executive sponsorship to me, actually starts up at the CEO or even above the CEO, right? So, for us, for this journey to be successful, you need to build believers in the transformation program and in the transformation program that is not incremental in nature. It's not buying a bunch of use cases and tools and trying to get incremental value, really thinking about what do I need in the next 5 to 10 years, what do I need to invest in the next one year, two years from a foundational perspective and that kind of executive believers and sponsorship that you need to really start accelerating your journey, right? And I say that is important because, you know, you could take different paths in the digital journey, you could have horses that are here that you're trying to, you know, push to run faster. It will be a limit. They will die at some point, or you could think about building a rocket ship or a space shuttle and for that, you need a different infrastructure today, right? And that's the kind of mindset that needs to be driven in this journey. The other thing that's important is it's also very good to get upfront and early on and on how you want your data to look like in terms of, you know, standardization and specification so that you can model it for your entire enterprise. So, understanding that and then during your journey as you start being, onboarding data on the platform is important.

Scott Tvaroh [00:22:02] You hit some really, really good ones there for other people to learn from you, Ibrahim, and I'm sure you may get calls after this podcast to learn more, right? It is very impressive though, if I look at the breadth of what you've done and the support you've got from



your CEO, Lori, and the board through this process, even through a very difficult time, maybe you can, we can close this out with sharing a little bit around, that, how you've entered into using gen AI into this program as well, and how that fits into your vision as you push forward into the next round.

Ibrahim Al-Syed [00:22:39] A really good question. So, generative AI is a game changer technology, right? So, it, you know, was released in the public world last year, you know, and really inspired a whole bunch of folks. What we are trying to do with generative AI and what positioned really well to do that is precisely because we created a robust data foundation in the last two years. We created a knowledge graph that I call, which is really a digital representation of your facilities on an enterprise scale, where you've modeled your data, and prepared it for it to be leveraged now by either generative AI or traditional AI. So what we aspire and what we dream with large language models and generative AI is about building one of the first industrial LLMs where you can create a copilot. That is part of the, everyday manufacturing assistant for us, where you can have a conversation in your natural language and you can start having a context built for you, have insights coming to you have, you know, when at work, whatever data you need, whenever and wherever is made available to you. I just a matter of asking for it. That's one piece that we're working on. The second piece is leveraging generative AI to help us move towards running our facilities by exception, which is we are leveraging now large language models and traditional AI and machine learning and AI, and coupling them together to create that natural language interface. What we really want in our facilities is for the steel to talk to us. Right?

And in order to do that, they want to talk to us in our language, and we can talk back to our steel in our language and have that most optimized experience. So our dream is that we will have our copilot or industrial, and we're calling it Celia across our entire knowledge graph that's on the platform. And we've already started rolling out a few of those iterations already. So we're very excited and really looking forward to seeing how generative AI will play a major role in our in our journey.

Scott Tvaroh [00:25:10] Yeah. Thanks, Ibrahim. It is fun to watch the AI, the Gen AI experiments that you're embarking on so far and look forward to seeing Celia in the future. That program has really been an inspiration, both to me professionally and our team. The chemical industry is currently very tight and investment capital and, you know, everyone requires quick return on value. I wonder if you might share some thoughts around the value you're achieving and advice you might have for others defining their transformation journey and securing leadership sponsorship for this. Something like you've developed this program at scale.

Ibrahim Al-Syed [00:25:49] Yeah, I think, you know, what's important is before we get started on this program, that we build a business case, that is tied not to a specific use case or a specific capability, but a business case that's tied to the vision. You know, if we were to get to that vision, what does that mean from a value perspective on the company's bottom line and then we have to figure out how long would that take, what is the roadmap to that, and then you have to start building a value profile curve and a cost profile curve, right? What what you expect is, and we did this, is what is the investment



and the investment is going to be significant in the, you know, in the early years. And then we will have the value start picking up in the future years, right? So you have to draw that value curve out. What we have seen is we started with that mindset. You know, what is significant foundational investment, a cost profile, a value profile towards our vision. But what we also see now is, you know, you could always think about, you know, what value that you will develop, which will come with the journey. A lot of the times, you don't even know what you're unleashing in terms of the capabilities you're providing and innovating with that you get sometimes a lot more value in the early years that you don't imagine. So in the first 2 or 3 years, we're actually getting significant value returns and much, I would say, much closer to how much we're investing. So the strategy is that you want to be in a position that this program becomes self-funded and you start generating more returns than what you're putting into the cost bucket, essentially, right? Earlier on, when we defined our value profile and cost profile, we actually went in with the proposal that you will have barely any value in the first two years. What we've seen is that we have had significant quick wins and it really, you know, in hindsight when we look at it, the power of providing the capabilities are people will take people to different levels of innovation and creativity and generate value that you never even imagined. So that's kind of stuff that we're saying.

Scott Tvaroh [00:28:16] Thank you, Ibrahim, I want to thank you for supporting this AI podcast. It's been really fun talking through, listening to your journey here. Hopefully we can have another podcast a year from now, and we can hear about the

great things that you and Celia and the rest of the team are doing over at Celanese. So thank you so much for your time and hopefully the audience appreciates the symposium.

Ibrahim Al-Syed [00:28:40] Awesome. Thank you.

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