

The HCLTech Trends and Insights podcast – Episode 5

Title: Aerospace and defense manufacturing solutions

Nick 0:07

Hello, everyone. And thank you for tuning into the HCLTech Trends and Insights weekly podcast, where we'll be discussing the latest key technology stories and events that are impacting and disrupting business and society. I'm Nick Ismail, the Head of Brand journalism at HCLTech. And today I'm happy to be joined by Michael Edelen, a Senior Director and Aerospace and Defense Production Operations Evangelist, who has recently joined HCLTech. Hi, Mike, how are you? A very warm welcome to HCLTech, how are you finding your first few months here?

Mike 0:42

Hey, Nick, thank you very much. Yes, I joined HCLTech about two months ago, and I'm very happy to be here getting to know everyone and getting up to speed on the processes. I came to HCLTech from SAP where I worked for 18 years. And prior to that worked for McDonnell Douglas / Boeing for 18 years, where my focus was manufacturing, execution, manufacturing, operations, management and manufacturing engineering. And I'll be continuing that focus here at HCLTech. And yes, I'm very happy to be here.

Nick 1:10

Well, thank you for taking the time out your first few months to join us for this podcast. And we're going to be discussing your area of expertise, which is aerospace and defense manufacturing solutions and, and the main trends and strategies shaping the future of this industries. So just as an introduction, can you outline the current state of the aerospace and defense industry post COVID?

Mike 1:35

Yes, on the surface, aerospace and defense has always been challenged by resource shortages, getting the right talent, supply chain issues and fuel costs. But under the surface, what's really the challenge for the aerospace industry is the speed of innovation. And it applies to both commercial and defense. But the Department of Defense really has a clear perspective on innovation in terms of Offset Strategy. And also strategy is how much technological advantage the US and its allies have over potential adversaries. And from the 1950s to late 1970s, they enjoyed 30 years of innovation and technology leadership. But by the 1990s, that was down to under 20 years. And by 2014, it was down to around 18 months. And now according to a recent report from the Australian strategic policy institute, the West actually trails in 3744 technologies. And these technologies are in areas such as defense, robotics and material science. So really, Nick, the speed of innovation is really the big challenge for aerospace and defense, and the ability to go from concept to product as quickly and as efficiently as possible.

Nick 2:47

Yeah, and so this increased speed of innovation, the technology era, would you say that the future is positive for the industry after what was probably a bit of a lull during the COVID era?

Mike 3:02

Yeah, certainly, I mean, certainly, during COVID, you know, with, there's really a big upset in the supply chain, especially. And the industry is coming out of that. And so things are looking more positive. You know, the air transportation industry itself, the flights are, as we've all traveled, you know, we see that things are getting back up to speed, the demand is back for travel. So yeah, things are picking up in the industry overall, for sure. It looks positive. That's great.

Nick 3:35

And are there any challenges that have precipitated down from the COVID era? Things like supply chain, or workforce shortages and, and things like that? Or have there been some new challenges that have emerged post-COVID?

Mike 3:54

Certainly, one of the challenges you mentioned there, Nick, is the workforce. So certainly there's a turnover with people retiring, a lot of people that were, you know, left during COVID are not coming back. And so there's certainly an initiative, I was actually listening to NPR radio station this morning. And there was a segment on there that, you know, we're lucky Martin Northrop, some other companies, you know, have an initiative to acquire talent to going out and looking for talent in engineering expertise, and so forth. And it was also as at a event at the Paris Air Show in 2019. And they were talking about the same issue about acquiring talent for the defense industry, and that there's so much competition now for these skills, you know, competing with, you know, the apples and Googles and Amazons of the world for talent, and trying to get those that kind of talent over to the aerospace and defense industry. And so there's a lot of effort being put forth to bring to get that talent you know, engaged and interested in aerospace and defense. Specifically, I don't know that it's so much related to COVID. But I do know that it's an ongoing initiative that the industry has in it as a challenge that the industry has in front of them as well.

Nick 5:16

Yeah, it's probably a similar case in most traditional industries, where you've got an ageing workforce who's retiring, who's got all the experience, but perhaps not the new skills required to work in this technology lead era, and then you've got all the millennials or graduates coming through who have all the new skills, but they don't have the experience? So you're at this weird kind of juncture, right? Yeah,

that's right. Yes. Great. And in terms of in terms of overcoming it, are there any strategies being deployed? Is it a case of rescaling and upskilling? Things like that?

Mike 5:58

There is, I mean, there's so for one, you know, the, the acquisition of people like even on the shop floor level, you know, it's challenging a little bit to get people on board with it. But they are, but the industry is moving forward with some advanced technologies that will attract people, you know, a lot of use of, of robotics on the shop floor, a lot of industry 4.0 kind of initiatives, and applying technology to for manufacturing, and the processes, the robotics, all of these kinds of things that hopefully will attract people to be interested in pursuing that. I mean, they're not necessarily doing the hands on riveting, perhaps, but more technology focus and things that they'd be more interested in anyway. So now, of course, you can't manufacture an entire aircraft with the robot. But certainly, the percentage of the assembly process that is part of that is certainly increasing. And anything to do with any of the new manufacturing processes or even the material science, certainly there'd be there's some interest in that we can hopefully attract people into the industry to be focused in those particular areas.

Nick 7:18

Yeah, and it's very much reliant on a human machine partnership, rather than just being totally taken over by machines.

Mike 7:27

That's correct. Yeah. So that human, the human robot collaboration, the CO bot, kind of forward-looking processes that were that the industry is looking at.

Nick 7:39

Absolutely. And just to go back to some of the manufacturing technology trends that are shaping the industry, you mentioned that it's, you know, bringing in new technologies is quite appealing. What are some of the trends to find in the industry things like digital thread, or the digital twin AI?

Mike 8:01

Well, it's kind of a two fold here, that the area that the industry is really looking towards, with the digital thread and the digital twin and all of that initiative. When when a new program starts up in aerospace and defense, what they're really looking at, currently, and again, this was a presentation that was I also saw at the Paris Air Show, but it's called Moving manufacturing left and they have in, in the Air Force. For example, an initiative called the E series aircraft or E Series program doesn't have to be necessarily aircraft, but what they want to do is the ability to take a you know, an engineering concept and do

complete simulation of the new program and you start off with satellite a rocket and aircraft and completely simulate that in the virtual world. So that we can we can simulate everything from the manufacturing process through the sustainment the maintenance of the product, looking at ergonomics, you know, what's the best way to manufacture it the best way to maintain the product and do all of the simulation before they ever start, you know, cutting the first chip of metal or laying down the first play of composite materials to build this aircraft and the purpose of that is in the in the past, the engineering would be released to manufacturing and manufacturing engineering would develop the manufacturing processes and we'd start producing the first unit and there would there would be a learning curve applied to it in that we would expect to get full rate efficiency at the 100 unit of production. And what the goal of the E Series process is is that we will achieve that that that level of manufacturing excellence or productivity on the very first unit would normally take us up until you know going through this learning curve through the you know the engineering manufacturing development phase low rate initial production Then, and eventually in low or for reproduction, when we would eventually achieve that manufacturing efficiency at the 100th unit, the goal here is to have that happen at the first unit. And so there has been some success in that a couple of programs have started and have achieved, achieved that the T seven trainer, for example, that I saw an article about, you know, the great success they had in getting that program up and running quickly. So that's one aspect of the challenges and the things that the industry is doing. Looking forward.

Nick 10:40

Yeah, and just that improved productivity, that improved efficiency has the bearing on the decarbonization, or sustainability goals of the aerospace and defense industry?

Mike 10:56

Well, on that front, yeah. So that that gets back into again, so we're wanting to make use of all the engineering processes and resources and the simulations. So some of the advancements there are more related to material sciences, you know, we're able to do more with carbon composite now. And they have, you know, whenever I was actually still working, you know, hands on industry, we're doing carbon pie layups, and you know, putting down pieces of carbon fiber onto molds. And now we are getting more advanced with fiber placement machines, where you can kind of it's almost like 3D printing with carbon fiber. And then of course, there is 3D printing is another one. But yeah, so a lot of the material sciences is allowing to get the same strength, the strength with the products, but with much lighter weight materials. That's why for example, 77 has much higher fuel efficiency is because the lightweight that's been put into that product through use of lighter weight materials. And so yeah, so there's a lot of sustainment in the industry around the material science. And then of course, looking forward, the industry is looking at sustainable fuels, and other ways to power the aircraft for sustainability initiatives.

Nick 12:20

Okay, and you just mentioned sustainable fuels. So looking ahead, what are the future investments? Will the aerospace and defense industry make to support their business goals? And what to companies need to consider when selecting forward looking? manufacturing strategy? Do you think?

Mike 12:44

Okay, so, so only looking forward for sustainability goals, of course, you know, we've mentioned the fuel and the lightweight materials. So those are some of the things that are looking for from a sustainability other areas that the industry is investing in investing in, you knows, like, supersonic aircraft, now really looking at the potentials, they're looking at electronic or I'm sorry, electric, vertical takeoff and landing aircraft for different types of mobility, that are available for cargo movement and passenger movement. So a lot of investments in those areas. From a manufacturing standpoint, I think the other side of that coin, you know, we're talking about the what, what the industry is moving forward with as far as that investment in, in our simulation, you know, where we can look ahead. So that's really focused on the engineering centric perspective of aerospace and defense, because, you know, aerospace and defense is very engineering centric. But on the other hand, it's also very resource dependent. And so I think one of the areas that companies should look at when you're look considering manufacturing in the future, you know, certainly everyone is already looking at the the digital transformation, so making use of robotics, and IoT, and all of that kind of stuff on the shop floor. But I think the other thing that companies really need to consider is the resource side of that, so that whenever a person on the shop floor is clicking that button on the shop floor, you know, what is that doing across the enterprise? You know, certainly when, you know, what I've seen in the past few years with SAP in responding to RFPs RFIs, you know, requests for information. Customers are really comparing features and functions of mes solutions, you know, so they're comparing, you know, for doing data collection, quality, collection, genealogy, giving work instruction information, and so almost every human yes solution will do that. But where they need to be looking at is how does it tie into the supply chain? And when I was, you know, thinking about this call today, I was trying to think of a good example of this. And I would say that I would look look at Walmart for an example. It's not manufacturing, of course. But the key of Walmart, what makes it so much different from, you know, the rest of the retail market, or, you know, what they did to achieve the success that they have, is had to do with that, where the rubber meets the road at that point of sale, that whenever they do that transaction, at the point of sale, that that reverberates across their supply chain, across their inventory, across their replenishment. And that is happening every time they click that, that keyboard or that or every time somebody scans if they're doing self checkout, or whatever. And so the same thing applies in the manufacturing view, as companies look forward, they shouldn't consider only the features and functions of an mes solution or manufacturing operations management solution. What they really need to consider is when that shop floor worker, you know, clicks that button on the shop floor, is it sending out is it transacting across the enterprise, where it's doing more than just genealogy collection, but it is also is it also triggering, the warehouse and the supply chain and the replenishment, and, you know, in, you know, all of the resource requirements around manufacturing, because it's one thing to, you know, meet those innovation goals and have that innovation and technology lead. And certainly, you know, that E Series program where we get from concept to that first production unit, get that done in record time. But beyond that, whenever we're actually moving into full rate production, it's really that focus of how is my manufacturing solution sitting in that side of the of the house, you know, we're now manufacturing is really reliant on not just engineering change

management, but now, my manufacturing is really reliant upon the supply chain, and the resource dependency that it has. Because, you know, even if I'm the OEM, and I'm doing the final systems integration, you know, I'm still getting all of my components from all over the globe. And so it's really, I think that customers need to like, just take a little bit higher view of how manufacturing fits in the enterprise, as opposed to just focusing on the closed loop manufacturing process, where I'm just concerned with engineering and the shop floor need to look at a more broad perspective, from an enterprise level.

Nick 17:35

Just as we just as we close, Mike, looking at the kind of the bigger picture. You mentioned, some of the new vehicles emerging and the way they kind of, you know, take off or supersonic jets, things like that, is it going to have an implication for society as a whole with these new type of vehicles that are being developed and these new innovations that are coming out of aerospace and defense?

Mike 18:03

Oh, yeah, I certainly think so. I mean, you know, way out on in, you know, way out in our field here is also listening to radio broadcast, where they anticipate that space tourism is going to pick up incredibly, that where space tourism is going to pay for everything to do with our space exploration, exploration in the future. So yeah, I don't think that'd be in my, you know, I don't think I'll be able to afford a ticket on on one of those space flights, but, but nevertheless, I just think that all of the, you know, the improvements in aerospace and defense are the innovations that are happening here, are going to impact humankind just as they have, you know, for the last 100 years since, or more or less, since we've discovered the ability to fly. I mean, it's just amazing improvements and amazing achievements that the aerospace and defense industry have made. And I think that will continue and still continue to change people's lives. Maybe it might not be, from your perspective as a passenger on a flight, that maybe that person is isolated somewhere that needs medication delivered to them, and be able to use some of the new capabilities of unmanned flight to get items to them, or maybe unmanned firefighting, for forest fires, all those kinds of things. So yeah, I think that there's one thing that's really nice about the AMD industry in general is it's just always, I guess, you could say, reaching for the stars. It's always been that kind of an industry.

Nick 19:49

Absolutely. And I think that's quite a nice place to conclude the podcast. So Mike, thank you so much for your time and for joining us.

Mike 19:59

Thank you, Nicholas. Been a pleasure to be here. Thank you.

Nick 20:02

No problem. And we'll hope to have you on soon. And just as we close this week's podcast, I'd like to highlight our HCLTech event round up. In May, we attended VECS23, the autonomous and electric vehicle conference. Here we discussed with leaders about the transition from the internal combustion engine to electric and the key steps needed to realize an autonomous future in transportation. We also attended AWS Summit in London, where we covered topics around how the cloud is transforming the insurance industry. And we'll also be in attendance at the Financial Crime summit in London, where we'll hear from leading practitioners who are implementing innovative techniques and practices to reduce financial crime threats.

We will also be in attendance at Snowflake Summit in Las Vegas and all the content from these events, including interviews with some of our leading HCLTech executives will be available on our HCLTech Trends and Insights page, and you can find a link to this in the description below. Thank you once again to Mike for his incredible insights. And thank you to the audience for tuning in. We'll see you next time. Goodbye.