The HCLTech Trends and Insights podcast

Nick Ismail
Hello everyone and welcome to the HCLTech Trends and Insights podcast. Today, we're going to be discussing how to drive meaningful digital transformation in a sector known for regulation, legacy systems, and high stakes. Digital transformation in aerospace and defense isn't just about adopting the latest tools. From the factory to the boardroom, it's about rethinking how companies operate, make decisions, and create value. In this episode, I'm joined by Matt Cordner, AVP and A&D Principal at HCLTech. We're going to explore how leaders can ensure that change is not only technological, but also cultural and strategic as well. We'll talk about overcoming resistance to change in such risk-averse environment, the evolution of tools like 3D printing, and what it really means to become a model-based enterprise 2. 0. We'll ask, in the face of global disruption and shifting geopolitical dynamics, how can Aerospace and Defense organizations adapt their strategies to stay competitive, responsive and resilient? Matt, how are you doing today?

Matthew Cordner
I'm doing great, Nick. How are you doing today?

Nick Ismail
I'm great. Thank you so much for joining us. I think let's get straight into the questions. In Aerospace and Defense, you've mentioned that digital transformation involves more than just technology technology, how can companies ensure they're driving real business value through changes in processes and behaviors and not just in adopting new technologies?

Matthew Cordner
After spending much of my career on the business side of A&D, in engineering, manufacturing, supply chain, and only in the last 10 years moving into the IT side, my perspective really has been that technology seldom directly produces business value. Technology enables behavioral change and process change that drives the value. And so many companies make the mistake of taking technology, pushing it down into the organization and expecting business value just shows up because you bought a new software or you upgraded or you bought a new tool and gave it to the business. Whereas it's a very complex process of involving the business, understanding what their objectives are, what their issues are, what their opportunities are, and using those to configure the program

that you're about to execute in a way that makes them feel as though something's being done with them or for them instead of to them.

Nick Ismail
So, Aerospace and Defense is a highly regulated and often seen as a resistant to change industry. What strategies can leaders implement to help employees feel more confident and comfortable in embracing and enabling change, especially when it seems disruptive?

Matthew Cordner
That's a great observation, Nick. The The industry is highly regulated. The regulations go from the management of data to make sure it's secure from a defense perspective, a cybersecurity perspective, safety of workers, integrity of the products. It is a highly regulated industry. Because of that, as somebody that has spent quite a bit of time either in engineering or manufacturing, one of my jobs, and really my primary job, was to manage variation to the lowest level possible. I Every time you get a process dialed in to where it's producing what you want, it's compliant, and it's meeting the objectives of the company. There are dozens and dozens of variables that every day have to be managed. Workers not showing up parts, not showing up systems - the system is not working the way that they should. And so managing variation to very low level is something that's very important to everybody that's involved in the design and the manufacturing and the maintenance of aircraft. Now, when these people get approached and they told, We're going to transform you. We're going to make your life better, and we'd like to go in and change everything about the way you do your job, where you get your data, what systems you use, how you plan, how you interact with each other. It can be very, very frightening. Because that management of variation now is being upset in the name of something that you didn't ask for. So it's critically important that transformation programs start, as Steve Jobs famously said, with the objectives of the business and work their way backwards to the technology, not the other way around. I call it the pull of technology rather than the push. The goal should be to create a pull in the business by identifying with their issues and opportunities rather than pushing it into the business, which will really build enormous amounts of resistance, typically, because in many cases, it feels like a threat to their well-being and their ability to meet their objectives.

Nick Ismail
You've also introduced the concept of model-based enterprise 2. 0. Could you explain for

what this means and why synchronizing various models across an organization beyond just product models is key to successfully achieve change and transformation and obviously maintain competitive advantage?

Matthew Cordner

Sure. I should probably stop admitting this because it dates me, but I began my career as a design engineer many, many years ago on a drafting board with a pencil. I had come out of college where I had spent one year on CAD, 2D CAD. And so very quickly within the first year, I was moved over to the CAD world and started creating digital designs and very quickly into 3D. And so when that happened, I started to understand that many of the benefits were not going to be realized unless people's behaviors changed. And so when I went through this process in the engineering world over a period of years, and that evolved into the use of digital definition of the product within engineering for simulation and for pushing data downstream to manufacturing so that they could use that data. Even off into the field, I got to see that incarnation of a digital definition of the product and how it benefited everybody in their ability to predict, to simulate, to define, to drive downstream processes. As I moved from that in my career into the manufacturing world and testing of aircraft, into material planning in other areas of the company, I began to realize there's other digital models. The product model, the definition of the product, the geometry, the bill of material, the engineering notes, and so forth, which is so foundational to what we used to call concurrent engineering or digital transformation in engineering. There are parallels in other parts of the business. In supply chain, there's models of the supply chain that can be simulated, that can be used to predict the performance of the suppliers, to predict the availability of parts and the quality of those parts when they come in. Financial Logistical models, logistical and sustainment models. Many, many of those models are actually in your ERP system. And just like an aircraft is a very complex system of systems that has to be designed with the whole in mind? What is the payload, the range, the speed, the maintainability of the aircraft? All these different disciplines in engineering, whether it's the engine, whether it's electrical, whether it's the airframe, all they have to work together as a team. And in many cases, somebody has to tell them what you can't do in the interest of the bigger picture. You can't build one harness from the front of the aircraft to the back of the aircraft because you can't get it out to maintain it because we buy it in two pieces and there has to be a There's a factor in the middle. And I often wonder why in the IT architecture world, why do we not design our IT architecture the same way? Because we have engineering, manufacturing, supply chain, we have digital models, and in many cases, we buy applications called PLM, E-R-P, M-E-S

systems for the shop floor to manage them. But the integration of those is very much an afterthought. We throw them over the wall to IT and we say, We bought these great systems. Each of our organizations is using them. Integrate them for me. I can tell you, after many, many years of working with systems and trying to get a product from design all the way through to production, then in many cases, those interfaces are the constraint to the processes. We came up with the concept of Model-based enterprise 2.0 to say, if you want to be a modern, enlightened digital transformation company, you're going to have to move beyond viewing model-based enterprise as just the definition of the product and start looking at models that you have in your ERP and other systems and synchronizing them all together, and designing your IT architecture as a complex system of systems designed to accomplish a single purpose, rather than just an accumulation of strong applications and business processes that you throw over the wall to IT and ask them to integrate. We call that Model-based enterprise 2. 0.

Nick Ismail
Thanks for explaining. Just to go back a little bit, I'd like to understand more about the digital technologies like CAD and 3D printing and how they've evolved and what impact they've had on both the design and manufacturing side of the industry?

Matthew Cordner
Absolutely! Many of these, tools on the digital definition side, such as CAD, really allowed us to stop manually recreating data for all the different people that needed to use it to make a digital definition that's high fidelity, has a high degree of accuracy to it, and then take those definitions and use them to drive downstream processes, whether those are digital simulation, finite element analysis, moving into the tooling areas, going into factory simulation, and then driving and see machines and so forth. And it really allowed the process of, the development of an aircraft and then the production of that aircraft to proceed much more quickly and with fewer errors in the transfer of data than it used to. As far as the 3D printing, which has been a very, cornerstone capability, I remember almost 22 years ago, putting together the first, rapid prototyping lab we called it at the time. Nowadays it's called additive manufacturing, and began making, nonstructural parts and putting them on flight test aircraft. And the primary benefit for many, many years was not that they were going into production and saving as cost, it was to support the iterative learning process that you do in the experimental in the experimental portions of aerospace, experimental being where you're trying to develop a new product and one of the foundations of developing a new product,

just like Edison, developing a light bulb involves trying things over and over and over again until you get them right. And 3D printing allowed us to do that in many cases. For example,if we're making a duct on an aircraft, that cost $50,000 to make a tool to build it, and it might take you 15 weeks to get it from a supplier, we could grow an overnight. And so we could go out and iterate over and over and over again and explore many opportunities we didn't have before because we didn't have the time or the money to iterate enough. So in the early days, it was all about iteration and accelerating product development. Over time, the cost of those, developments in additive manufacturing has come down. And now some of these are starting to migrate into the production world, but typically on the lower end of production, as far as the lower volumes. Right. But it's made a market difference, obviously, in the higher volume areas of, automotive and so forth. But in aerospace, it's, it's really had its, its mark and the ability to leverage directly that digital model that was made, in the engineering world and, and produce something directly from it.

Nick Ismail

And, and just before we finish, I'd like to look at the external factors impacting the industry, given the current global challenges such as political shifts and very recently, increases in defense spending, how should aerospace and defense companies adopt their digital and business strategies to stay competitive, efficient and responsive in this rapidly changing environment?

Matthew Cordner

That's a great question. There are, many things that are, on a daily basis disrupting the ability of aerospace companies to execute their business, whether it's obtaining materials, whether it's changing requirements, whether it's changing volumes, where because of increases in defense spending, you suddenly have to ramp up production. And the word I like to use, that is really the key to to the ability to respond to this is agility, right? And in many cases, we, we think about, automotive or aerospace as the winner is the company with the best product. But we're in a very long cycle business. It takes three, four or five, six years to develop a new product. And those products are in the field typically from 20 to 40 years. So in that long cycle business, it's very, very important that you have the ability to monitor enormous amounts of information both inside and outside your company, find meaning in that data and respond to it very quickly with a new plan that you can quickly communicate to all the people that are involved, so that everybody's marching together at the same time. And so what that does is it gives you a business case or a focus for business value. This agility does,

into which you can apply digital tools, analytics, AI for the ability to monitor enormous amounts of data, finding meaning in it, in the world of machine learning and also AI, now and then, the ability to go in and, and use these wonderful applications like ERP and MES and CAD, to really make changes or, to chase opportunities or, fix issues that you have much more quickly than we did in the past and communicate those to these global supply chains that we have so that everybody's marching together at the same time. These digital tools have enabled that so many cases, the focus has to be as much on the the agility of your design, manufacturing and support communities. So I would say the, the keyword there is applying your technologies to allow your company to be, more agile and to respond more quickly than your competitors to these things that are disrupting the industry.

Nick Ismail
Matt, thank you so much for your insights on this very timely topic.

Matthew Cordner
Sure.