Aviation Week Podcast with Accenture: Embrace Automation Aviation Aftermarket

Aviation Week Chief Editor MRO Lee Ann Shay talks with Accenture Global Aerospace and Defense Lead John Schmidt and Accenture Aerospace and Defense Aftermarket Lead Jon Baker about this and how technologies such as artificial intelligence and virtual reality are already making an impact on MRO—from optimizing inventory and maintenance planning to improving customer service on a technical level.

Lee Ann Shay: Hello and welcome to Aviation Week's Check 6 with Accenture. I'm Lee Ann Shay, Chief Editor, MRO at Aviation Week, and your host for this edition of our regular podcast on major issues facing the global aerospace and defense sector. I'm joined today by two Accenture leaders, John Schmidt, Global Industry Lead for Aerospace and Defense, and John Baker Aerospace and Defense After Market Lead. Gentlemen, thank you for joining me.

John Baker: Thanks Lee Ann.

John Schmidt: Good to be here. Thanks Lee Ann.

Lee Ann Shay: We're going to talk about how data and technologies such as artificial intelligence will shape the future of the aviation aftermarket and drive it to new levels of automation. To lay the foundation, let's start talking about the data piece and then move on to how technologies can use it. John Baker, MRO is undergoing a digital transformation.

Lee Ann Shay: How long will it be until it operates as a paperless administration?

John Baker: Great, great question. Well, because we're on that journey, it's started, many may say it's gradual and one day we will suddenly realize that we have actually accomplished it. And I think we can take note, a little bit of history where this has happened in other industries where you know, go back, cast your mind back to the '80s and '90s, we had tons of paper in our offices and today we have very little, we have very little in our consumer lives. And they were driven by devices, software technology that tackled certain use cases. They became very popular and then adoption was very, very fast. So, we got a similar situation here. We've got plenty of technology that can be applied to this space. So, we're not short on tech plus some of the new applications of AI and machine learning are able to increase that velocity on digitalization.
John Baker: So, I think the answer is we're going to see certain use cases that will get very fast adoption. We've probably got some regulatory steps, standards that still need to be established, but it'll be a mother of necessity here in actually driving that digitalization forward. And we're already seeing some of those use cases today. I would argue although paper is still a strong currency in aftermarket, we're all still looking at digitized versions of that paper. In other words, we've got it paired up. I think that will change over time and the paper will gradually go away.

John Schmidt: Yes, I think it's going to be a while. Paper's going to be with us for a while. I mean we have to think about when the next kind of conversion of the kind of life cycle of the new aircraft comes through before we're really going to be able to think about true paperless. John, you know, and as you well know too and you write about, right? There are some places where we're seeing no paperless functions and we've got a technology that we've been working with around and you know, taking data and digitizing it. We started in engineering, so this is more of a first article inspection kind of application where we can take a spec, we can run it through an AI engine and ingest that spec. And then when a part comes in with the test package, we can match that up.

John Schmidt: The AI engine matches the two together. It looks for the connects between the spec and what came through in the test package. Where there's an anomaly, an operator is alerted. The operator then goes and makes the corrections. There's a machine learning component which actually takes those corrections and learns from them for future. You think about how we might apply that into the MRO in the services space in a similar way, we're going to start being able to get to a point where we can take the paper and start ingesting it and therefore I start working some of that stuff out of its existence. But it's going to be a while. I'm not giving you a number.

Lee Ann Shay: You anticipated my next question.

John Schmidt: You want to hear the years.

Lee Ann Shay: I do, I do. So, the aviation aftermarket companies are all at different levels of leveraging their data. And as they progress on this journey, what wisdoms can you share to help them accelerate this?

John Schmidt: I think there's really three things. The first one is really focusing on where value can be improved and interactions, whether it's customers or suppliers internally with employees and what the role of data can be in providing insights that can lead to action. So, think about that first. The second thing is to recognize that not all data are created equal, right? So, you got to identify the data that really matters to the job that needs to get done. And then the third thing keeping it very high level and simple here is don't forget about the pipes, right? I mean you need a good data architecture, you need good data governance. I mean we see a lot of effort going into master data, you know, management so that the data
becomes more useful. Otherwise data is just the next new shiny object that we start talking about.

John Baker: That's super important of those points but data quality in particular. Because if we're thinking about AI machine learning or even just pulling back from it and thinking about advanced analytics, if you don't have good quality data, it's just you- you're simply going to be a disaster situation. If you're going to try and adjust more data, you don't have a solid foundation, also very problematic. So those topics like MDM and governance, which, you know, are particularly appealing sometimes when you're trying to improve, you know, significant amount of money and technology to get it done, yet you do have to take some of those steps. You can do it in phases. Then one other tip I would give people, and I've seen a lot of people do this recently, is get to know your data.

John Baker: And we would talk about all of these transformations and technologies and that's fantastic, but so many people have never actually seen all of their data. It's locked away in legacy systems and usually the access might be a limitation of that system or the tools they have to actually get to it. So, try and extract it, some of that, put it into a modern BI tool. You know, your Tableaus, your Power Bis, your Domos, and get to know it. See whether you can start to draw insight because, you know, one of your data scientists or people who understand that transformation is not that hard. You're only doing it as a read only thing, you're not trying to do a transaction off it. But get to know your data, then that'll help you focus in. I've seen people do it and it's absolutely enlightening when they go through this process.

Lee Ann Shay: That makes a lot of sense.

John Baker: Yeah.

Lee Ann Shay: Aviation aftermarket is very fragmented and global. Often the same companies compete on some work and then cooperate the next day on other work, and that can complicate data sharing.

John Baker: Yes it does.

Lee Ann Shay: Then what tips do you have for that situation?

John Baker: Well, there's two things that I'd like to talk about here. First of all, if you look at the situation today when we've got dozens of OEMs and tier ones, hundreds of suppliers, hundreds of airlines, and you think about all of the potential internet connectivity that could happen there, we've got a complex problem. We do have some emerging solutions. You know, you can look at Skywise and other solutions like that, that are definitely attacking pieces of parts of this problem. And we see a lot of people who are doing their own custom point-to-point integrations, EDI type integrations. You know, we're going to have to deal with the fact that if you are an OEM trying to create a new digital service or solution,
maybe it's a plus one to what you've got, maybe it's something unique in a software offering, you are going to have to deal with this in the short term because we do not have the silver bullet just about to come over the horizon.

John Baker: So, thinking about some of the more modern data ingestion and translation tools of which there's dozens out there in the market like the Informatica tools and Oracle and things like that. They really can help you in that endeavor. That is as opposed to having your people who are building your solutions do custom programming for everyone. It just becomes too much. You really do need to take advantage of those. Many of them run in the cloud, they can be scaled, they can be programmed to deal with the different formats. They can do some of the translation down to economical form. So, it does make it easier. Now having said that my call to action is that the industry needs to act upon is to start to establish better mechanisms and solutions for data exchange, better standards and establish this connected ecosystem that I must guess almost every OEM I have talked to over the past a year or so talks about, but we have to come together and start to make it happen.

John Baker: I don't think it's a one size fits all. I think there will be potentially multiple of these but why can't we establish some of these technologies, some of these standards because we will need it. We won't push aftermarket forward rapidly until we can overcome this. We have to be in a shared data and take into account the fact that your airline customers, they're not always going to be automatically predisposed to sharing all their data, all their secrets with you. So, you have to take that into account. They have to have an ability to control what they're sharing, ensure security, understand what you're doing with it. And that takes a lot of effort as well. That is not really a data-oriented thing, that's a little bit more philosophical, but we've got to embrace that and understand that and try and help support them from that perspective.

John Schmidt: Yes, I think in the near term what we're seeing where it is companies come together around critical mass opportunities, right? Whether it's around a specific pro-product or with a particular OEM or in some element in the services side. And so, it's similar in my mind to what we've been doing for years on the engineering manufacturing side where you have companies that partner on one program where they're competing on another program. And so, figuring that out today without having some of the benefits of things John was talking about it takes that critical mass opportunity. And there's a few of them out there that, you know, I've even read about in your pages Lee Ann.

Lee Ann Shay: I think you have. That's all really good wisdom. But when this all starts to come together and when data and software become a key part of an aftermarket service, how should traditional companies entering this space prepare?

John Baker: Well, I, there are some things that we've already seen taking some clients through this journey and observing others from afar. One of the ones that I think comes up a lot is embracing this notion of automation. So, the reason that we feel that data intelligence is key to aftermarket is because we have so many
things going on in this very eclectic ecosystem, they're very manual, lots of manual processes. Not that data's not involved and we're not using systems and looking at data, but it's not very well interconnected, we're not getting good insight, we're not seeing a broad view of our business we're often seeing very narrow ones. So, let's say that gets fixed. What are you now going to do with that? And one of the things that we see that comes from this is that we can start to put automation into the processes.

John Baker: It can be as simple as RPA. It can be as complicated as artificial intelligence and everything in between. But what I would suggest is think about the fact that automation is going to come into your business. Think about where you might want to start. What are some of the simple decisions or workflow tasks that could now be automated? And you can then start to embrace the impact on the workforce. The good news here is this is not really one of those situations where automation is going to suddenly start displacing everyone like we see in other industries like, you know, retail and things like that. Because in most cases we don't have enough people to do the jobs anyway. We're already trying to make them more efficient, we're trying to get them to focus on the high value tasks. If you're in a selling mode, you're going to close more deals, you are going to be smarter at doing that.

John Baker: Your clients are going to be more responsive in a delivery mode. Again, you can deal with issues and exceptions and not focus on some of the more turnkey type tasks that we can actually automate. And for me that is going to be probably one of the big things you can embrace, just one of the little ones, and I joke about this sometimes is be prepared for the automation to hit your business. Now a lot of people will tell me, "Oh you had the automation. I'm not quite sure about that. It's a very human to human contact and we understand that and no one's trying necessarily get rid of that. We're just trying to focus that conversation and maybe automate the preamble." But be prepared for the day when your customer is actually a machine interacting with you.

John Baker: You know, to think that a bot of some sort is not going to come in and try and make a parts order. It will happen. Scenarios like that will happen. So, we can't just keep focusing on the handshake, human relationship all the time and say that's our reason for not automating or not taking on the technology.

John Schmidt: Yeah, I think everything John said makes a lot of sense in what we're seeing and how we're interacting with our clients. I might take a slightly different tact on that and maybe on more of a macro scale, because one of the things you asked was how traditional companies entering this space around software dominance, right? And you have to deal, and I think, you know, in our words, right? The shift embodies managing what we call the wise pivot, right? And ultimately the wise pivot is kind of where you make decisions around investments in talent or in technology or how you manage your finances between what is kind of the now and what you're doing and then the new and where you're trying to go, in this case, into a more software-dominated world.
And in recognizing that as you make that pivot into that new world, it's most likely going to require tenure, the right kind of talent, a different organizational alignment, potentially partnerships with other ecosystem players to accomplish what you want to be able to do, and maybe acquisitions that will bring in specific capabilities or software technology to be able to help you get to where you're going to go. And when you're looking at that as a traditional business, you know, we found that there are three dimensions that are really critical. The first one is digitalization, right? Of processes. Being digital and going digital is one element of it. The second one is around co-innovation and recognizing the role that ecosystem partners can play and accelerating, and in some cases lowering the risk profile we're trying to accomplish. Then the final one is really thinking in new ways and how new business models and taking lessons learned from other industries.

Like maybe the software’s or service industry-

Right as a for instance, and in the aftermarket services. So those three dimensions are really key as a traditional businessman's that wise pivot, think about the three dimensions and how that affects you and impacts you. It opens opportunities for you and take it from there.

Yes. The new business model one is very important. If, when software becomes part of your product is it just simply something that's driving efficiency and is a nice plus one or is that now what you're selling? So, you often have non-software companies who end up with a software product who are now trying to monetize a software product and that can be very complicated especially if it's a cloud SaaS-type service. And if we need evidence of that let's go back in history and remember how long it took for Amazon, AWS or Microsoft and Azure to develop profitable cloud businesses with business models that worked for both parties. It took a long time. Oh yeah, we can learn from those things, but we should not trivialize that. It's just going to be a question, "I'm going to put a SaaS offering to guys and I'm going to charge per seat or I'm going to charge per transaction." It's not trivial and it needs to be thought through.

I have a lot of follow up questions. Technologies such as artificial intelligence, machine learning, augmented and virtual reality, and even blockchain are optimizing aftermarket operations. How have you seen any of these applied to the very fragmented parts arena?

Well we have quite a few examples and maybe John and I will split these up a little bit.

Let's just start with basic parts selling. We're starting to see intelligence and I would say it's in the advanced analytics stages and maybe just starting to move into basic machine learning on parts, forecasting parts, pricing, really starting to understand the ecosystem. And of course, let's remind ourselves in a survey by Dr. Michaels last year what was the number one thing that was on the concerns
of airlines? It was part costs and repair costs when the part cost side. There are things we can start to do about that. But it is again, a very complex ecosystem.

John Baker: And until we join those dots together in a digital thread like manner we can't see these optimizations, we can't control our supply chain. We have got to do the distribution better. We've got to find where to manage pools and inventory. If you're into programs, programs are absolutely going to be a bullseye for some of this work because you as a provider of a PBH/PBL type program are looking to try and optimize across a very wide swash of concerns across multiple clients, multiple aircraft configurations and components. Very complicated. But that's exactly what machines are good for. So, we are seeing people now who are starting to put definitely advanced analytics together and the machine learning is coming up close on the inside. We're seeing quite a lot of proof of concepts going on there.

John Schmidt: Well if you just think like in terms of solutions, right? That we're engaging with, right? One is on the customer service side, right? So, when you get to, you the technical service agent who's getting an incoming call and how we can start using artificial intelligence it's not quite as simple as this, but like having Siri to help answer some of the questions that you need to answer as a technical service customer agent and getting the right person to the right part. "What do I need? Do I need this part?" But you also need this and this if you're going to go.

John Baker: Yes.

John Schmidt: Right. And instead of having a lot of that being done by training or by tribal knowledge, "I've done this for so long, I know." Right? Or experiential. Now we can actually start using some of these simplified digital assistants to help make that job easier. And this is building on work we've been doing for a long time on connected technicians, right? So, it's not necessarily parts, so I'll go a little broader than parts when we think about how we're doing services, but the connected technician who can now be able to communicate with someone who may not even be physically in the same state or country for that matter, to be able to get advice and counsel on what to go do in a certain bit of a tear down for instance.

John Schmidt: Then we talked about the parts intelligence I think a little bit and for a long time, you know, being able to know that 50% of the time this part's going to have to be replaced. Another 30% of time, maybe we can refer a bit, right? We know all that because we had all this historical data even way back when I started doing this stuff back in a long time ago.

John Schmidt: We had all that information. The trouble was we didn't know the one that was coming in is this one that has to be replaced or refurbed. What about the next one? What about the next one and just because 50% it doesn't mean they're going to be equally every other one, right? And that was part of the trouble in the planning and how you make efficiencies happen. Now, thanks to some of that data we were talking about earlier, especially on newer aircraft, newer
engines, we're starting to be able to use AI engines to better identify when that core comes in what's going to be the case for this one based on how it's been running in the heat and the cycles and all the other things.

John Schmidt: So those are a couple of examples and maybe not totally in parts. I went a little outside, I'm sorry about that. Paint outside the lines that we're seeing AI engines really coming into the services space and then really helping quite a bit with efficiency and ultimately that reduces cost and without having to sacrifice margin.

Lee Ann Shay: Well, that leads into my next question perfectly John, so thank you.

John Schmidt: Oh, you're welcome.

Lee Ann Shay: Let's talk about examples and maintenance. Everything from optimizing schedules to quickening turnaround times.

John Baker: Well obviously we've talked a little bit about things like Skywises you know, providing some of these data hubs and the preventative maintenance platforms that are, that are emanating from them. That's definitely going to be one thing that we'll start to give more information and insight, maybe advanced notice to those MRO facilities. But within them, when I've toured a number of them, what people always are talking to me about is the efficiency of the people there and what they're able to do, what they refer to as bench-to-wrench time.

John Baker: And it's a little bit varying, you know, depending on which facility in, sometimes like some component repair shops are fantastic, little bit more of a closed environment, maybe a little bit easier to pull that off. And they have some really good efficiencies, you know, larger, you know, MRO maintenance facilities. It gets a lot harder. So, it's not that they don't have good systems, there are workload systems, there's resource management, task management, electronic task cards now, access to technical documentation. But really there are still use cases around there that are causing delays. "I don't have the right parts. I don't have the right tools. I'm stuck I need help. I need someone to come and approve the work I've just done."

John Baker: And if there's any kind of ripple in that kind of ecosystem, it's very difficult to necessarily be able to react to it in real time when people are, you know, halfway up an airplane working on it. So, there are definitely some things we can do to address some of those use cases. John actually mentioned the connected technician before, and I think this is kind of a group of technologies that we have been thinking about working on that really is addressing, doing the actual work. And of course, augmented reality. A lot of people have talked about it, many people are investigating it. We've got clients who are actually trying to test the efficiency of that type of technology right now.
John Schmidt: Well, even taking things like incoming inspection, using drones, you know, I don't want to think it's just about the person, right? But it's about the entire process.

John Baker: But anything that is highly labor intensive. And so, image analysis is actually one area that I've seen a lot of people work on. The drone inspection is actually one of them when they actually do it, flying the drones on a flight pattern around the complete surface, stitching the images together and doing image analysis. I've also seen people applying that to components. Super high-resolution imageries on a 360 rostrum, and then using an image analysis to do that initial inspection which can take a long time, and the computer can do it in a matter of seconds.

John Baker: And of course, you know, we know that image analysis and AI applied to that is a big topic as we see in our consumer lives. Google and Facebook are doing this all the time, right? The image and face recognition, which is a really pretty hard science. But think about that same technology looking for, you know, hairline cracks or strange looking stains that might be on the component and might give you indication as well as the problem. You really can't shorten the tasks down there. And I think that we still are suffering in MRO that we have a shortage of technicians and I think some of this technology can help with that as well.

Lee Ann Shay: You've mentioned everything from your workforce development and training to customer service. Are there any other areas of the aftermarket that you've seen some breakthroughs that we haven't discussed?

John Baker: Yes, I mean there's quite a few. I'll pick on one which is network operations. We're seeing a lot of people now who are building solutions that are augmenting an airline's network operation infrastructure. They're looking at all of that data and applying intelligence and insight to try and help optimize, not just the day-to-day, but obviously when there is specific occurrences due to weather due to maintenance due to other anomalies that happen to be going on. I think that's a very big area. And you know, flight operations as well, John, right?

John Schmidt: Yes. Disruption and managing disruption obviously is that really big one that we see in there? The one I'm kind of excited about and you probably have heard from us before is really the role that digital twin digital thread can start playing in terms of our ability to better service and maybe extend services of aircraft. So as aircraft are operating, as we're collecting that data and we're managing the twin, we can start seeing what's happening and start feeding that information back into engineering so that instead of having it, you know, maintenance be done on a serial based or a time based or some other schedule based, we can start actually looking at when we need to do maintenance or where the priorities need to be around maintenance based on actual usage, how many cycles, you know heat et cetera.
John Schmidt: I mean that's a really powerful technology and right now we're just starting to get to where companies are recognizing how to use that operational data to file back into engineering to help improve the product. The next step is then slide it back so we can improve the maintenance and reduce the cost to operate.

Lee Ann Shay: We've talked about so many things that I have many follow up questions to, but gentlemen, we've run out of time. I am sorry. So, thank you John and John, I really appreciate your insights. We do have to wrap up this edition of the Check 6 podcast with Accenture. Be sure to tune in to the next edition and thank you for listening.

John Schmidt: Thanks Lee Ann.

John Baker: Thanks Lee Ann.