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INDUSTRY X: INTELLIGENT OPERATIONS

VIDEO TRANSCRIPT

Andy Kohok:

Good morning to everybody. Andy Kohok out of our industry strategy practice. Would love to talk to you about intelligent operations or the product cost side of the aspect of the DT model. You heard a lot about pricing and promotions and right, what are the digital ways to get the pricing right. But when we talk about design to margin, right, that is definitely the cost play and optimizing the cost is pretty important as well. So I'll talk about that as we go to the next slide.

So product costing is not a one-time effort and our audience today who is interested in understanding what are the best practices, this particular slide shows you that product costing has to be optimized throughout the product life cycle. And much difficult to do than showing this on a page because product cost, probably 60 to 70% of the product cost is decided much earlier in the product's life cycle. And then to sustain it with product changes, customer expectation changes, you need a mechanism across the life cycle that we call digital thread. And lot of our leaders are now focused in one, the product cost visibility, but the right data and analytics to make sure you're optimizing the product cost, whether it's direct materials, the cost for conversion in manufacturing or your supply chain cost. To do a degree where you can manage control and be competitive.

So I'm not going to walk you through all the steps, but there are a few things that I want to bring to your attention as we get to the demo on how technology can help you in this product cost management across the life cycle. But very importantly, right when we are getting into the innovation, the concept, we talked about pricing and attributes of the product, same is true for product cost, right? Product complexity can really hamper your product cost and not all complexity's bad. We all know we need the right different configurations to make sure we are satisfying our customer need, but is your product portfolio with the right features, driving the right costs? And that's the most important decision in that concept of portfolio management piece.

When we go into designing the product, there are many more technologies now utilized for design for cost, design for supply chain, design for manufacturing. And that's important to bring those feedback loops into your design, right? Are you utilizing modular architecture model based design, regenerative design, to make sure you have the competitive cost right during design. So those two boxes today, we have a lot of enabling technology and everybody should utilize that to make sure you have competitive cost right in the beginning. One aspect, another that I will add is the manufacturing. The design for manufacturing is extremely important for your conversion cost. Today, you have simulations to simulate if you're routing is going to impact your product cost, for every product, every product configuration, right? You do not have to go through the reactive way of optimizing your design for manufacturing. You can do it proactively using the simulation techniques.

And once the product is launched, it is also very important to design your product as a service or the maintenance or the warranty aspects of it. So it doesn't just stop at product launch. Many a times, what we're seeing is at our client's product cost management is from ideation to launch. And that's what is owned by even product managers. What leaders are doing is they have the closed loop product cost management, it's beyond product launch. Even after the launch, till the retirement, you still have the same entity on the P and L of this product, so that you have feedback loops for the 2.0 product or the S-curve of your product roadmap. So if you have questions, feel free to put in the chat box. The key of the art of possible of product cost management is managing it. Not one time, not simulating it only at the initial stages, but throughout the life cycle. Let's go to the next page. So what's so interesting about the intelligent operations? Next page piece. Yeah.

So what is new today? Right? The new is the possibility of what can be done that was not possible without the data, the changing of data to information to insights using analytics. So what if we show you demo and we showcase, you can now analyze this product cost for design for manufacturing in your design phases. You can have should cost or design to cost or design for manufacturing in your concept phase.

Your engineers would have at their fingertips, what the cost drivers are. And you can utilize this data not only for the engineers, but spread that data to your supply chain, to your manufacturing, to your suppliers, ecosystem partners. So everybody understands, which are the critical cost drivers and what is expected in continuous improvement to manage those cost drivers. Right? So with that, instead of the slides we wanted to show you what this could look like. So I invite our ecosystem partners, aPriori, to walk you through how technology can help with should cost, product cost management across the lifestyle.

Scott Carlyle:

Good morning. My name's Scott Carlyle. I'm the executive vice president at aPriori, and really welcome the opportunity to talk to you today about the exciting avenues that are going on in simulation of cost in many aspects of the product development process. And Andy, I appreciate the introduction there. If you could please proceed to the next slide?

Thinking about how this has evolved cost estimation is not a new science, it's something that has been done, but most frequently it was done at the tail end of the development process, where you had strong expertise in different manufacturing processes to analyze what it would cost. And what's changed is the ability to apply simulation. And with simulation, you have the opportunity to understand costs at all different stages of the product life cycle. So as Tom appropriately pointed out in the beginning, price is the most important ingredient to understanding margin. That's what we're going to get for the product. The other dimension of that though, is really understanding the cost implications. With those two pieces, we can actually understand our margins and make great decisions throughout the entire development process.

It's been interesting to watch how this technology has been applied. From industries like aerospace and defense to heavy industrial through the volumes increasing through automotive, then into consumer products, and then from consumer products like electronics and durable goods as we now see it in consumables. Because the trend is the volumes increase, but with those increases in volume, you really have to the implications of cost because that directly impacts the overall product line margin. So these are the things that now that we have digital definition, we can apply it at different stages. So in sales or the early concept stage, what are we doing?

We're iterating, we're looking at different options. Well, to make that trade off, we want to understand certainly performance, durability,

but we also want understand weight. We want to understand cost. And in the very beginning, Russ pointed out the fact that sustainability is becoming a very important issue for all of us. Well, guess what, when we're simulating the manufacturing process, we get great insight into things that impact sustainability. The material, the energy consumption. So these are all things that are on the horizon for this ability to apply the simulation technology that we're going to be talking about today. So I think it's so exciting that I want to give you the opportunity to go and see the technology in play. And with that, I'm going to hand that over to Dave McDermaid, who will run you through a quick demonstration of applying aPriori to a consumable product. With that Dave, over to you.

Dave McDermaid:

Thanks. Thanks Scott. So while aPriori is thinking about simulating manufacture on my products, I am designing them. And our major objective is to keep ahead of our competition. And that's what I, as a design engineer, primarily focused on that my business needs to keep an eye on costs. So aPriori is going to guide us through this. And the first thing it'll do through all the simulation work that it does is provide me with an email. The email points me to things that perhaps I should consider as a design person or anybody in the business who's focused on keeping costs down and designing to margin. Here in this email, for example, are a list of components, which have opportunities for cost reduction crucially before I've completed the design. This component here, I'm in the process of designing. And if I follow the breadcrumbs through to the simulation that was performed, I get some insight that I couldn't possibly have got before. I also don't need to be a cost expert. I'm just focused on the design and it's going to tell me things I should think about. The first thing that is of interest is the actual cost itself. So here's a breakdown of the manufacturing process that was simulated and the major cost elements and behind here is a very detailed, surgical, precise evaluation of the manufacturing process that tells me the overall cost of the component and the overall cost of the tooling and fixturing to make this product. And that's useful to my business it's part of the pricing analysis, it's part of my cost analysis. As a design engineer, it knows in the simulation of manufacture, where are the bits that are making it difficult to make, and by the way, make it difficult for me to procure as well.

The simulation that was performed is one that runs within a digital factory. And the digital factory is performed in Slovakia, but it could be any of the major regions of the world or an actual fact digital representations of people in our supply chain and their manufacturing cost base. And some other production parameters that went into the simulation and the digital twin, the CAD model, these are the elements that it uses to provide this very insightful list of things I should consider.

So here, for example, are areas where I've not considered a draft or where I've designed in blind holes, which fine from a design perspective, but here's some guidance as to why the increased manufacturing complexity can push costs up. As a design person, I basically take advice from this list of features.

Scott Carlyle:

So let me pick it up from there. What Dave's embarking on is actually highlighting the features in the model that drive manufacturability. And what's interesting is engineers oftentimes, and I don't want to do engineering slamming like Tom did, but sometimes they can be independent thinkers and therefore don't take into consideration the manufacturability or really understand the detail or the cost implications of those respectably. And as we talk about mass customization, you can get a lot of features that can get quite interesting, but let's really understand the cost impact of those respective features as we're doing it, as we can impact

before we started making tooling before we sent it out for manufacturing in a faraway place, let's really understand all the implications and options available to us. Imagine being able to trade off manufacturing in Dave's example there or lighter housing in different parts of the world.

We're understanding the labor rates, we're understanding the energy cost, we're understanding the overhead associated, and those all contribute to the overall product cost. So you get to make some better decisions when you work your supply chains in terms of where we ought to build this thing. So those are the dimensions that are super important. And they're actually things that can get influenced by the design because we have certain capabilities in certain regions, or it can get influenced when it's time to do production planning and execution. So these are the insights that we strive to bring to our customers and get better decision-making throughout.

It's pretty interesting to watch how customers approach this understanding of cost and there's different strategies. Oftentimes they'll start with a center of excellence and if you haven't done a lot of cost analysis previously, that's a good place to start. Build up some expertise in a particular area of your company and be a center of excellence that people can leverage or go to service providers like Accenture to help with that because they have that deep understanding. And then over time spread that knowledge throughout the organization to create cost awareness. Some of our clients call it the war on cost, cost enablement, different strategies for getting the whole organization aware and conscious of it. But to do that, we found that having the information, the data behind that is really what changes the behavior in the organization. So ultimately everybody becomes aware at all the different stages of product development through to launch to make better decision making along the way.

Don't know if Dave's going to come back.

Russ Rasmus:

Yeah, hey Scott. In absence of Dave, as he's the only one with technical challenges, can you talk a little bit about how your algorithms which are quite unique, use that data to help solve these cost simulations quite quickly. Can you give us a little bit more background on that?

Scott Carlyle:

Absolutely, Russ. Happy to. So it starts with a digital definition and the richer that definition is the more insights we can burn. So we saw a CAD model there. That's great. That that CAD model has tolerances on it. That's even more helpful because that's going to dictate where we're going to call digital simulation. So we start with all the information we can, and then we analyze the model and we call them basic cost drivers. So if it's a hole or if it's a plastic part, or it's a machine part, sheet metal stamped, we analyze what it's going to take mechanistically to make that part.

We then run it through what we call the digital factory. The digital factory is a representation of the mechanisms necessary to make it, but also taking into account the important data. That data would include the material cost, the waste, the overhead, the labor costs, the cycle time, all go into that algorithm that ultimately produces the cost of that per piece. And when you talk about per piece part cost, it's other variables include things like annual volumes, batch sizes associated to that and tooling. So all those things are incorporated into the algorithm that ultimately produced the piece part cost that you're looking for to understand.

Russ Rasmus:

Yeah, no, that's great. And Scott, you guys also for labor rates, you guys are doing that by region as well. So it's all sensitive to where that product might actually be manufactured as well. Is that correct?

Scott Carlyle:

Yeah, it is absolutely true. In fact, we go out and secure regional labor rates from 79 regions around the world. So we'll take a given large country like China, we'll have 11 different regions because there is high variability from East to West in that region, for example.

Dave McDermaid:

Hey I'm back folks. So I have no idea how much we lost there. Sorry.

Russ:

That's all right. Scott gave a great verbal overview of what they were going to see and the capabilities, but if you've got the capability up, we'd love to see a quick demonstration you had for us.

Dave McDermaid:

Okay. I'll give you two or three minutes worth. Where did I get to when you lost me?

Scott Carlyle:

You had shown design guidance on a blind hole.

Dave McDermaid:

Right. Okay. So in a nutshell then that's the tip of an iceberg. Let me just share my screen.

Okay. That's the tip of an iceberg. In fact, there are many more areas in which design guidance has given and ultimately every person in the business can take advantage of that. People manufacture, people in design could consider the fact that we could use a more expensive material that actually becomes quicker to manufacture because of its expensive properties. And then ultimately we'll get a better cheaper product. Then we can make changes to the design, evaluate different alternatives, and then get our component cost down by 9% just on that one part. In actual fact do the same thing for an entire product. So every component in this product could be simulated from manufacture. And then the results that come out of that we can use to understand where in the business are the best opportunities. If we've got thousands of products, we're designing, we can use outlier reports to identify ones that have the best chances for cost reduction and then focus our key resources on working on those components next.

The same level of insight allows us to understand where, of everything we're manufacturing, where we're buying lots of material. So we are buying a lot of this grades and material for everything that we were designing around the world, so let's design more of that. Let's design less of that material because we're not going to get much buying power on it. And people in procurement can use the same capability, the same simulation to understand which parts of the world they're going to start manufacturing in, which components are more cost effective in which region, depending on the complete value chain. And we can start to design for those regions.

In fact, aPriori wants to automate the whole thing. We want to take this and make it more automated. We'll use the product lifecycle management system as the springboard to take information that people are designing, simulate manufacture, and then generate reports to point people to the most lucrative opportunities for design to margin and focus on just them. And that's how we help our clients design to margin. But crucially give them more time to innovate because we eliminate the waste that is normally associated with getting it wrong first. You want to get it right first time. Okay? So that's a very quick summary of how we help our organizations, but clearly there's more to it than that. Okay?

Russ Rasmus:

Yeah. No, thank you, Dave. So that's helpful. Yeah. And the power that we see in a tool like aPriori is many times we are guessing at what that launch cost might be for a product, or we've actually got to go through a prototype, a physical prototype in a manufacturing

environment to get an understanding of that cost. And now we've got with tools like this, we've got the ability to actually simulate that and then also be able to simulate the innovation and the pricing together. And the data enrichment as a part of this process is so fantastic that we see great things ahead when we start to combine these tool sets with each other. So great stuff. Scott, Dave, and Andy, thank you. Any other questions? There's one here from Michael on the side that we'll answer for sure. But curious if we've got any others out there as well.

For Michael's yeah, it's a great question Michael. We talked up front in the challenges of the consumer goods industry that, yeah, we're really starting to see 'wow, I actually need four or five different supply chains now to fulfill my portfolio as opposed to one'. And as we see more and more late in the process, postponement type configuration or specialization, it gets tougher to understand what that cost is. And that's why we need the data from tools like aPriori, tools like pricing analytics type capabilities in the innovation side, to be able to very quickly configure on a quick product launch or protect, potentially not even a product launch. It might be a product modification given a trend that we're seeing in the marketplace. And we can do that via late configuration, somewhere out at a 3PL or something. It's complex. So you've got to be able to capture those costs, not just at your core manufacturing, but potentially at third-party colemans, potentially at 3PLs that are doing value added services for you. So there's no easy answer there, but in the best case, we're trying to account for margin out in those quick change type areas as well. Andy, do you have something to add?

Andy Kohok:

Yes. And Russ, you talked about one of the fulfillment of delayed differentiation. But Michael, what we are seeing is the strategy of BTS, CTO and ETO is impacted by fulfillment models that impact your cost. So like I had said right at the get go in the first steps of innovation and portfolio management are designed for this fulfillment models. It's important to understand which of those differentiated hyper-personalized focused products need to be configured to order or engineered to order and to estimate that cost. And of course with that estimate, the right pricing. But BTS versus CTO versus ETO is a true problem statement that we're seeing across the consumer goods and designing for this fulfillment models is critical in the start.

Michael:

Hey, appreciate the response guys. So follow up question, if you've got, say, CG&S clients with a more traditional supply chain that was really aimed at the high runners, would you see third-party manufacturing as a viable supply chain strategy for them to start traveling down this road of a differentiated product strategy as versus building out those supply chain capabilities in-house?

Russ Rasmus:

Yeah. Often we see that. We actually see that as their test bed, right? So man, I need a flex manufacturing line that I don't have instead of investing that capital, they may use a contract manufacturer to do that, and then either continue with that model if it works and it's cost-effective, or transition that technology of the flex model in-house. So yeah, I think what you'll see a little bit more Michael are more in consumer goods, more strategic relationships between consumer goods companies and their coleman, much like we saw the migration too, in the high-tech and aerospace sectors over the years where there's more of an incentive for that consumer goods company to partner with the contract manufacturer, as opposed to them being purely a supplier for them.

Michael:

Okay. Thanks.

Scott Carlyle:

An interesting trend I might add to that is customers are making make versus buy decisions earlier in the design process. The other dimension is we see the contract manufacturers using this technology to quickly reply to request for quotes because you're getting these marketplaces forming really quickly. And customers are expecting 24 hour turnaround versus three, four, five, six weeks. And the technology works on both ends of it to accelerate the decision, first data informed decision-making, and then response time between the respective entities.

Russ Rasmus:

No great point, Scott.

Andy Kohok:

Yeah. I was going to add with the make versus buy. So Michael one important point, right? For companies who have been in BTS or mass production, that's a different skill set and it's not in 180 of make versus buy. Make versus buy and having the coleman capability is cross-functional. In your procurement, in your manufacturing, in your design for outsourcing, these areas need to develop the new skillset. And we have clients all the time in consumer goods to basically develop that governance, develop that skill set, develop the processes associated with make versus buy, using facts like Scott was talking about, using these tools to make the decision.