

Art of Procurement Podcast Transcript

Episode 155

The Applications and End Game of Machine Learning with David Hearn

Philip: [00:00:03] Hi everybody. Welcome to The Art of Procurement this week. I'm Philip Ideson, the host of the show. My guest today is David Hearn. David is a longtime procurement executive for companies such as Juniper Networks, Kaiser-Permanente, and Sun Microsystems. Today, David is the CEO and founder of advisory firm CPO advisement services.

Our longtime listeners will actually recognize David. He's a repeat guest, and definitely a friend of the show. I caught up with David at the recent ProcureCon Indirect West Conference in Scottsdale Arizona, where he was talking about machine learning and its impact on procurements. We had a wide-ranging conversation talking about the evolution of machine learning in procurement, different use cases, the supply market for machine learning procurement tools, and also where procurement leaders can actually start to experiment.

If as you listen to the show it sounds like we're recording in a garden, well, we were. We connected on the last day of ProcureCon, with the majority of the conference space already cleared away. We set up in the hotel garden. It was a 100-degree heat. It was blazing sun as we were recording. We were surrounded by birds, waterfalls, and rather unexpectedly a construction site. So, see if you can spot those noises in the background as we talk.

In my conversation I had just started asking David what exactly is machine learning.

David: [00:01:24] I have no idea what machine learning is. I'm not a technologist but what I do know, because I had to read up, is its actually just algorithms. And so, I'm thinking back to my Mathematics days that uses statistics to look for patterns or anomalies in data. But the key is the algorithm is build such that once it finds linkages that it thinks are linkages, you do have to tell it when it's wrong. You don't have to tell it what's on its way, you just see that it's right. But when it's going the wrong way, you nudge it back. So then, you never have to nudge that again. Because the algorithm is built to remember that. That's why people talk about teaching your machine learning algorithm, but that's done in the development stage. So, by the time it gets to a customer procurement group it's already been taught. Now, they may have the ability to teach it a little more but you know 80-90% of it is already taught.

Philip: [00:02:25] Kind of the stuff that's unique to an organization like over and to build on top of what are some of the norms that apply to every organization just in case.

David: [00:02:33] They always have the ability to tweak it at the end.

Philip: [00:02:36] How is machine learning maturing? Because it seems to me like it's something we never heard of and then all of a sudden, we hear about it all the time. Is it just

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something that's already existed that has a nice new sexy title? Or, is technology really evolving what is possible with machine learning?

David: [00:02:54] Well let's put it this way. You know I'm not the youngest guy in town. Machine learning was actually invented and coined in 1959. I wasn't born. Okay? So, it has been around for a long time. Because the basic technique was conceptual at that point. There was no horsepower in computing to do it, but the mathematicians knew once they had the computing power, how to do it. It's based on mathematics.

Philip: [00:03:26] Right. So, it's the application of something that's already existed for a long time.

David: [00:03:30] It's now just sped up at a pace that it can gobble data.

Philip: [00:03:33] What made you so interested in--. Because I know -- Here we are at ProcureCon, you just did a speech or presentation on machine learning. Why were you interested in kind of exploring what the possibilities are for procurement?

David: [00:03:48] I've got to admit that I've been searching for something and I didn't really know it was machine learning. But as early as back three jobs ago in the 90s we had disparate data from multiple ERP because most companies do. We had lots to spend on PCard, on travel, entertainment, expense report data. And I just simply said, you know source a source. I want to see all the data. And we couldn't do it. We've been trying to do it. Excel is just not able. Nor do we have time to source people that program Excel to that level of sophistication.

That's just getting the data together. That's not the jewel. That's a necessary evil and it's powerful because machine learning actually helps the merge. But what I care about is getting insights about sourcing, consolidation, leakage, fraud, areas where we can put new programs into place because the spending is fragmented and we can pull it together. I'm a sourcing person. What happened was, you know asking about that 20 years ago the answer was Excel. Okay. But over the years, then people started talking about big data. I would admit I leapt at that Big Data is going to solve that for me. And then Big Data didn't solve it for me. Okay?

Then I started to read about a course now - machine learning now. It's something new. But it's something applied to a problem like this. But only in the last year, literally 12 months, have I seen that procurement tool suppliers and multiple of them are now saying we're bringing our experts in machine learning to apply it to indirect procurement. So, I got very excited that finally 20 years later we're going to get the kind of insights to sourcing that I thought we should have had 20 years ago.

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Philip: [00:05:50] What are some of the things that you are seeing that's kind of exciting you that maybe wasn't available before? I mean you don't have to name names but I'm interested how we could apply the concepts of machine learning into procurement.

David: [00:06:02] Yes. So, I actually have seen real customer data which came from multiple ERPs plus PCard plus TNE expense report data. So first it was brought together, and then machine learning had to figure out how to combine it and categorize it. Because remember, every tool, every Visa card, MasterCard, they all categorize differently. What can be called video conferencing here is called collaboration software here. It's called telecom over here. So, machine learning has to say I think these are the same things because otherwise you can't give a report to a Category Manager.

So, I saw them take millions of PCard transactions, expense reports, it was a large company, and eight ERPs. Bring it together. They did their special sauce and it came out categorized. Could you say "Well, there's no international standard for categorization." Correct. But if it comes out 90% correct, you're so far ahead. If you want to tweak it a little, tweak it. But don't tell them how to categorize.

Machine learning is like a pachinko machine. It will fall out into natural buckets. Let it. Okay. But that's not the insight. The second step is then the machine learning looks for patterns, anomalies across the data. Let's say, so these guys were looking through all the spending and they found that they had Dropbox spend and the sourcing people like Dropbox. They're not the preferred supplier. Nobody should buy a Dropbox. So, they found that it was bought 53 times in the organization across. Some guys hit it in expense reports. Some put it on PCards. And then, actually some got away with POs somehow.

He says our preferred supplier is this. So, bam! They can whatever change policy, change direction. But also, a security violation can put IP outside the firewall and Dropbox. And lastly, compliance. Because you're not supposed to buy a software in TNE. So that was a great example where massive amounts of data that no procurement person could get through in their lifetime, quickly yield in the email literally to the sourcing manager for telecom and says "Hey, we found other companies or other vehicles where they're buying Dropbox. What do you think should happen to it?" So, it doesn't go further. All it does is bring what we call it insight.

As a procurement person. I'm helping these companies. Like I wrote 50 insights that a procurement sourcing person would want to know but never could know because it was too laborious. And so that's what they're doing the magic behind the scenes to do.

Philip: [00:09:07] So that's then really all automated. It just is a notification that comes out.

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David: [00:09:10] It is a notification. Now, the search is major that you can go to like Dashboard and do tweaks and drill down in because--. It doesn't do your job for you. But it sure speeds up getting you information that's helpful.

Philip: [00:09:25] Right. This may seem like a silly question but as you know with my buying hats on and thinking about what we actually buy, what do we buy when we buy a machine learning? Is it a box that turns up that we tell how to learn? Are we buying solutions that just have kind of the concept of machine learning integrated into them so you can drive some outcomes?

David: [00:09:45] Yes. No, it comes in an Amazon prime box two-day delivery. Yeah. It's all service. Because that's the other nice thing. You don't have to worry about what's in the black box, they do. They are typically whoever the supplier is. They're running their own servers, which are probably on Amazon, and the software. You are accessing it usually through a portal on the web. Secure, of course. And so no, you're buying a service. It's not a one time. You know how in the old days because it's so laborious we might do it every quarter or we may not even look at PCard data every six months.

Philip: [00:10:25] Yeah, and it takes them six months out of date by the time we've got the chance to look into it and put it all into Excel and build our model.

David: [00:10:30] This is near real time so the data from your transactions is flowing to them in near real time and the dashboard is coming back in near real time. I mean literally it's coming back in hours because obviously it's what the computer horsepower does to figure it out.

Philip: [00:10:47] What do some of the pricing models look like for machine learning? Are you buying it as a subscription or are you buying it, I don't know, by the number of inputs? How does that work?

David: [00:10:57] So my input to my procurement peers is start looking into machine learning solutions because it is here. However, I also told them it's only now here. So, there is no standard pricing model. The industry has not worked out how you value those. What I have seen is some will value it as selling you a service for spend visibility because that's the first step. Some companies will just want that. My goal is beyond that to pay for insights, which of course are going to be more valuable. If you tell the outsourcing and say I save millions of dollars, wow. That's not just a spending analytics tool.

Philip: [00:11:47] No they can price based on the value of those derived as opposed to the input cost of creating something.

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David: [00:11:53] I don't want to open Pandora's box but I don't know the answer to that question because the suppliers that I've talked to is in really beta mode. I haven't heard pricing models.

Philip: [00:12:05] No. Well that's interesting though because in a procurement perspective it suggests that there's flexibility in approach. It's not like this is the defined--. You know in SaaS it's here's your monthly subscription costs for whatever it is that you get but this is so immature that you can actually work things out then perhaps work for both of you and work for the partner, the folks that you are actually working with.

David: [00:12:24] That's a good point. I also see that the same data set and insights could be for internal audit to look for fraud. It could be to the compliance group if you have one. So, I'm not sure it's just the sourcing people that will be using this. Maybe even accounts payable to help them. So also, the funding may come from different parts of the company.

Philip: [00:12:46] As a procurement organization, we have to think about technology. We have to think how it's going to impact those. I mean how is it going to impact procurement itself from the delivery of procurement services. But you know, we're in a pretty unique position that we can look at what's happening in outside markets and the technology that's being delivered in our side markets and bring it in to our stakeholders. So what kind of guidance would you give to--. I can't be a manager, for example, who was thinking how could actually machine learning impact my category and how can I bring that into the organization so it sure helps maybe buy what I'm buying today but in a different way. I'll bring more outcomes up by the deliverables from what we're buying today.

David: [00:13:22] Well, you hit on the real end game which I didn't mention. But the end game is making is more credible with stakeholders because we bring deeper ideas into their spend and how to, if you get a better supplier or lower costs or whatever. Think about it today. You kind of go to our stakeholders with basic spend reports. I almost felt guilty when I was doing it going to CFO. I literally did because I felt like I should be better at this but I just don't have the tool. If I can go and have these really things where the stakeholder goes "Wow really? How did you figure that out?" Okay. So that's the ultimate goal. You wow them. Now, you asked: How do we prepare ourselves, category manage? Here's my biggest concern. Since I'm not an expert at the mechanics mathematics, what's the first thing the stakeholders can ask? They're going to say, "How do you figure this out?" So how do we learn as category managers an inch deep on machine learning. I just didn't have to be able to describe we've put all the data together, algorithms were built, we looked for patterns and anomalies, we told them when it was right and wrong which helped it to then get better and better on time. That's how I gave you this insight Mr. Stakeholder. But if we walk in and go "I don't know. That thing just spits it out." That's a loser,

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right? We have no credibility. So, I do think we have to do a little education. Basic. Nobody should have to be an expert in machine learning to apply this well.

Philip: [00:15:07] So, as you've learned more about machine learning over the last, let's say a couple of years, what are some of the places that you've gotten to kind of get that waiting for yourself?

David: [00:15:16] I started, like I said that we started in 1959, and it helped because it wasn't based on jargon and marketing terms, it was just a mathematician describing the concepts which were almost in layman's terms because he was brilliant so he could simplify things. That helped me. Because when he said mathematical algorithms combined with statistics I get that. I started back where it started. How it's progressed, I will fully admit I don't know how big and bright these algorithms. And I don't care if it's a C++ or some magic language. It doesn't matter to me. So, the learning I did was on the basics. I actually stopped there. Now, learning who's doing it, I did start to research then in current technology. Am I hearing them saying it? And I only started in the last year. Now I almost know everything. Now, who's actually--.

Philip: [00:16:23] Now, separating the marketing from the reality.

David: [00:16:26] I haven't fully done that. So that's why I'm asking for data because I'm facts and data now. PowerPoint slides guy. So, guys if you don't tell me the customer name or blah blah blah, I want a real-world example where you tell me what you did, what data services were used in the outcome, a sourcing outcome. If they tell me that, blinded, then I feel comfortable that they're really doing it.

Philip: [00:16:53] What kind of the use cases if you come across? You mentioned you know spend analytics and kind of driving some insights from day term spend perspective. But have you seen other use cases or other ways they can apply machine learning perhaps even today?

David: [00:17:07] Wow, you know something just came to me Philip that I hadn't thought about is I actually experience machine learning seven years ago and I had totally forgotten. I worked for an extremely large medical hospital health care system. I was helping insourcing in IT and they were geniuses, PhD geniuses who were startups in using machine learning on medical data. What they were doing is pouring over something a doctor would never have time for but presenting the doctor with a "Hey, based on what we saw here, here, here, here about this patient, you might want to look here because we see a combination of circumstances that weren't apparent on the surface. So, this concept I'm sure is actually applicable. Any place we have large amounts of data. So, this whole thing of Big Data felt like a marketing term that never came to fruition. I think it turned into machine learning.

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Philip: [00:18:12] Yeah. Interesting.

David: [00:18:14] So you have to have complex data. But then if you're trying to get insights that no human can do on their own that's machine learning.

Philip: [00:18:23] Do you see how much of a human touch is still required to get those insights? So, is it really just the setup of the initial thinking? I'm thinking of a better term. It's escaping me but you know making sure that it's intelligent. It's thinking about things intelligently. You said before, once it does it warns it's learned. It doesn't need to be told how to do it again. Is that where the human touch comes in before he gets the insights?

David: [00:18:52] Yeah. It's like you don't want to be the first customer because the first beta customer does a lot of the teaching. But if you're in an industry or function, so let's say indirect procurement, we know that while very slightly between companies and industries 8% is really similar. Therefore, those first customers that train it are training in a way that it will be applicable to the next 100 customers. Now if you go to direct materials, you'd probably have to train it again. Or if you went you know that medical insights you've got to train again. But if you're in a similar category, it's accumulative learning. So, the first 10 teach you 90%, the next 100 teach you another 5%. So, there's a network effect. The learnings are shared. They don't keep the learning specific. That's part of their business models which is you can't keep your own learnings. I got to be able to tell the next customer I figured out a way to find this fraud. So, every customer will benefit from the other customers before them.

Philip: [00:20:02] It's like you know in procurement outsourcing. I was in procurement outsourcing. The importance of spend data across customers you know you pool, it's anonymize, it's aggregated, but then that provides a benefit for the whole community of clients. And we continue to build on it so it's kind of that same concept.

David: [00:20:20] Yeah, exactly.

Philip: [00:20:22] What advice would you give to a CPO who's thinking about exploring some of the technologies you said right now. A lot of things are still in beta mode so they are going to be an early adopter. One, where to start is in an area where it's right to start and perhaps spend another ticks as well maybe do something else, you know just from what we talked about. But then how should they develop that relationship with a partner who is still early stage? Typically, you're not going to be working with somebody who's a giant multibillion dollar revenue company. It's going to be a startup. It's going to somebody who's getting into this for the first time.

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David: [00:21:03] Yeah. Yeah. The good news is I think there's low barriers to entry because they in procurement. They will be spinning analytics first. Therefore, all you have to do is give

them your data. Obviously, you can get past any confidentiality. So, since it's easy to give them the data without risk because usually in the early stages they're looking for companies to give them data so they can continue to build the models. So, if you approach the smaller guys, I agree with you. Because the bigger guys, it's hard to get the attention. So that's what I would do is search out. Things are being written now. So, it's not like you can't find them. These companies are not all stealth now. They may be small in startups but they have websites and things like that.

Philip: [00:21:59] Right. And they're well-funded. I imagine some of them as well.

David: [00:22:02] I'm amaze. Well, that was what surprised me is I'm like VCs are spending money on indirect procurement. What happened here? Well, they woke up with their billions turning trillions of dollars in our unsexy profession. So yes, they are well funded. Frankly, just hit Google and start a little bit of searching and talking to people because they are out there and it's a low risk to start.

I would say that having a vision that you're not going to stop spend analytics because that's one value. But I really think helping your stakeholders see that you have used technology to be much smarter than we ever were, is the real benefit.

Lastly, don't spring it on your people. Like I said if you haven't taught him the basics so they can explain where the data came from, it will, I think, lose credibility in the beginning stages. But do, and this is little maybe not great at the beginning but longer term look at your processes because I think machine learning and learnings from it -- If you look at the procure to pay or source of pay I talked a lot of outsourcing but I bet you there's five or six places within the whole process where the process will be helped by the insights that come out. So, buyers could be helped. Sourcing managers, actual internal audit, fraud, and compliance, AP - this is not a one trick pony. So, you'll have to remap your processes to see where to maximize the leverage. Because when you finally do get to paying for this, don't just go and say it's a sourcing insight tool. It is but I think you'll be able to get a higher ROI to your CFO if you look at the applicability across multiple areas.

Philip: [00:23:59] I got one last question that kind of follows up on that because I'm imagining, you know doing something as a pilots or a proof of concept or something where you're working with one of these suppliers who -- you know having this new machine running technology are playing to spend on analytics and doing it concurrently with an existing solution perhaps especially for those organizations that are a little bit more mature and then doing a compare and contrast to say "Well, this is what data comes out using this approach. This is the data that

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comes out using our traditional approach. What's the difference? What's driving more insight?" That's still a lot of work. I just wonder how much work really is involved in giving them your

spend data? Or is it just a matter of calling an expert at this point because you've already got it in another and you know pushing it over.

David: [00:24:45] Yeah. It's funny because over the years people have cautioned me to give out of my procurement data. Now there is of course some intellectual property but most indirect procurement spend is not. It's confidential but it doesn't have intellectual property in it. Okay? So therefore, I was like a data--. What would you call it – peddler. Everybody that came through the door I'd give data to you because I do what you said. I literally before machine learning, I'd give it to all the SI. I'd give it to all the consulting firms. And I go “Hey, come back.”

Philip: [00:25:21] It's yours. What can you do with it?

David: [00:25:23] And you're going to come back and you're going to come back. So, I love the shootout approach because that will help us all figure out who comes back with insights, who comes back and says “Hey, get your data in a model.” Now, can you give me two people for four weeks to sit in front of it and train it? No. I really like a tool where it's trained.

Philip: [00:25:46] It's done for me.

David: [00:25:47] You know it's like I don't want a little puppy. Can give me a puppy that is potty trained. So, we will separate who is advanced and who's just beginning in machine learning.

Philip: [00:25:57] Right. Well David, I want to really thank you for taking the time to have a chat on machine learning.

David: [00:26:01] Yeah. Thank you for talking. The peanut gallery that we have above us in all the birds in this tree that we're doing this outside it seems like they've all come to listen in and give their own perspectives while you change the procurement to the art for a cure right here in this beautiful setting.

Philip: [00:26:03] The peanut gallery that we have above us and all the birds in this tree that--. We're doing this outside. It seems like they've all come to listen in and give their own perspectives.

David: [00:26:12] Well, you change the procurement to the Art of Procurement here in this beautiful setting. So, thank you.

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Philip: [00:26:17] Well, all the further information and details on how to contact you, I'll put your LinkedIn profile on the show notes.

David: [00:26:25] All right, great. I'm happy to answer emails, LinkedIn, whatever.

Philip: [00:26:29] Great. Well those will all be at artofprocurement.com/machinelearning. That's artofprocurement.com/machinelearning. Thank you very much.

David: [00:26:36] Very good. Thank you.

Philip: [00:26:38] Thanks.

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