

## **The Future of Supply Chain Podcast**

### **Episode 4: Trends, Technologies, and the Next Generation of Supply Chain Leaders with Justin Goldston, PhD**

**Richard Howells:** Welcome to the Future of Supply Chain podcast from SAP. My name's Richard Howells. I'm the Vice President for Thought Leadership for SAP's ERP, Finance, and Supply Chain Solutions. And today I'm joined by my co-host, Nicole.

**Nicole Smythe:** Hi everyone. I'm Nicole Smythe, and I'm a marketer, blogger, and podcaster in the supply chain area here at SAP. And today we're joined by our guest supply chain expert, Dr. Justin Goldston, to discuss trends, technologies, and the next generation of supply chain leaders.

So welcome Justin. Thank you so much for joining us today, and it's really great to have you on the series. So if you could just take a moment to introduce yourself, give some insight into your past experiences and what you do today.

**Justin Goldston:** Thanks for having me. I'm a professor of Project and Supply Chain Management at Penn State University. I'm also an advisory board member for the graduate school at Georgetown for their supply chain program.

You know, my journey is a little bit different in that I spent a number of years as a consultant within the ERP industry, where, you know, I kind of gained that experience from supply chain. And I always tell my students, I've seen the good, bad, and dysfunctional within the space, I have that experience and actually take that experience and bring it into the classroom.

I spoke with a student last night when I was driving back from Penn State where, you know, I take my teaching style from one of my professors that I had in undergrad, in my supply chain program, where she actually came from consulting and then she would teach the concepts. But then she would say, 'Okay, back in my consulting, whenever I was consulting for Corning, you know, we had this, this, this, and this happen', and then she brought everything together. So, that's essentially how I bring in all my concepts, where I want to bring in topics and organizations that students can refer to.

And, you know, when we're talking about supply chain, I said, everything on your back got there through supply chain management. I said, if you look at this table, and I broke it down, I said it starts from the tree manufacturer, starts from a warehouser, and it comes all the way down.

And then one student in the back said, 'Man, for this one little bottle here, that's why you talk so much about sustainability.' I said, exactly. So, bringing all those things together makes students understand not only supply chain management and the importance of it, but why I scream about sustainability from the rooftops.

**Nicole Smythe:** That's awesome. Well, it's great to know that, with the future of supply chain, with our new students, that they're understanding that, you know, it really is the backbone of our world, and of our country, and of our economy. So it's great that they're already learning that as early in their career as possible.

But from the title of our series, we're talking about the future of supply chain, like we were just saying, and now that strategies are being molded and organized and rolled out, what are you seeing as top priorities for supply chain executives for this upcoming year?

**Justin Goldston:** I would say that, based on my experiences, based on things that they're talking about is that last year with Mark Zuckerberg talking about the Metaverse, a lot of executives we're trying to understand the Metaverse. And you know, I was, discussing to them where we've been talking about digital twins and digital threads for years now. We're just going to be bringing those concepts into the Metaverse where it's going to provide additional transparency to everyone, right? With digital twins, you're gonna be able to build factories within the Metaverse. You're going to be able to have all of that equipment and see those things, and now your technicians can actually operate and do maintenance from the comfort of their homes, in some cases.

In addition to that, I would say AI is one thing that executives ask me a lot about. I think that with demand sensing that's gonna be a big player. Predictive maintenance is one thing that's going to be a big player.

You can go to [justingoldston.com](http://justingoldston.com) and you can see some of the things that I talked about. I mean, this goes back two years where I said that artificial intelligence is not going to replace jobs, it's just going to assist us in making more informed decisions. Now, I would say with Chat-GPT coming out, in some industries, some people would disagree with me. But, I would say in the supply chain space, it's going to assist us in making better decisions.

**Richard Howells:** Just as a follow on from that, do you think most companies are advanced enough from an IT and technology standpoint to meet some of those goals? I mean, to create a digital twin of their supply chain?

**Justin Goldston:** No. (laughs)

**Richard Howells:** So what advice would you give them?

**Justin Goldston:** It's just like I said, I implemented ERP applications for a number of years. Even today, there's organizations that do not have the expertise to implement traditional ERP application.

But to me, it wasn't the technology, it was the culture and the people. Same thing with digital twins, digital threads, the metaverse, artificial intelligence. It's the culture and the people. In my opinion. These are my thoughts.

All of those things begin with education. You know, you need to bring in consultants and start at ground zero, get back to basics. Understand what the current state of your data is, to see how long this journey's going to be. Right? And then you essentially start from there. You know, you have to assess your digital transformation maturity, right? You have to understand the current state of the organization's digital transformation strategy, you know, and go from there.

And that, you know, I always say that an ERP application is nothing but code, if you think about it.

**Nicole Smythe:** Hmm.

**Justin Goldston:** It's nothing but code. And it's not a silver bullet. It needs the people to flip those switches, to activate those modules, to configure those tables, right? In order for it to run efficiently.

But, even if you have it configured perfectly, the people have to understand it. Then after they understand it, they have to continue to use it. Because you all know in the ERP applications, you'll go live. People will use it. Yeah, yeah, yeah, yeah, yeah. Two months later, after you close the books, some of them are back on Excel spreadsheets. You know, so it's just like the digital twins, it's like the metaverse, it's like AI, where oh, they might use it because it's the new shiny thing, but then they might not go to it. So you have to keep people in it, just like with the ERP application.

**Richard Howells:** I used to do a lot of implementations and I always used to look for the naysayer - the guy or lady that's got it all in their head and wants to keep it that way. And once you convince them of the benefit, they bring everyone with them.

**Richard Howells:** Same exact approach. I'm going to make that naysayer, the cheerleader, the champion of the project, right? Everybody just wants to feel included. People want to feel important. And I want them to feel important because, in most cases, that naysayer is the person that has the majority of the knowledge and they don't want to relinquish that power. So if I'm going to convince you to say, 'hey, we need you the most, because you have all the knowledge.' That's the person, that in some cases, I dealt with manufacturing, so that's the person who left high school and has been at that company for 30 years ever since. That person is the most valuable asset to the whole entire project.

And some cases, if that person leaves, we're in trouble.

**Richard Howells:** That's exactly right. If they're sick for a week or two, then all hell that's loose. And they realize they have to get that into the business system, into the manufacturing system, into the planning system or whatever.

So I want to give you a chance to shout from the rooftops because you said you shout from the rooftop about sustainability all of the time. If you look at us as consumers, we're more focused on, increasingly on, on the environmental impact of the products that we buy, how they're manufactured, how they're distributed and so on, and what their carbon emissions are. And many companies have their corporate goals set up and mission statements saying they want to get to zero emissions by whatever date or be part of the circular economy. But, in my opinion, many are not in the position to actually meet those goals cause they don't have the processes and the business systems in place. And supply chain is one of the big areas of problem, of generating emissions and waste in a business and therefore also a huge area of opportunity.

So what role do you see in supply chains playing moving forward, from a sustainability perspective?

**Justin Goldston:** I think supply chain is the key driver.

So, for example, you know, whenever we talk about sustainability, I ask my students, what's the primary issue when we talk about sustainability? They say, 'oh, pollution'. I say, 'okay, who are the key contributors to pollution?' 'Oh, cars.' 'Where do cars come from?' 'Manufacturers.' Exactly. And then we break it down from there. If manufacturers are the problem, how do we make the world a more environmentally friendly place? Oh, we make the manufacturers report their emissions. Exactly. How do we do that? We use ERP applications, and then some of the savvy ones say, we use blockchain. Okay. You get extra credit. So, it's the same thing with ERP applications, you've had to peel back the onion. You have to kind of figure out what the root cause is, and from a sustainability perspective, not only are they learning about supply chain management, they're being analysts themselves in going through that

exercise, right? And what's even better is some of them actually give me insight I didn't even know about, I didn't think about, because you're making the students think critically, right? That's the important piece.

I was on a panel back at the beginning of the pandemic. And one of my peers on the panel, he said, some of these things when we're talking about supply chain resilience during the pandemic, but, in my, experience when people talk about sustainability, it's kind of like buzzword bingo, right? They do it, but really don't have plans in place.

Another thing I talk to my students about is you don't have to agree with all of these people that are saying certain things in the industry as thought leaders, people on social media, because there is an important place in social media. I said, but you have to hear them out because there might be one little thing, one little shred that kind of sort of makes sense, or you can take that and kind of flip it into something positive for your mission and vision.

That's what I think about, you know, in terms of supply chain management, social impact, sustainability. I want to hear these guys out who think that this is a conspiracy. Sustainability is a conspiracy. Climate change is a conspiracy. I want to hear you out. Because there may be something I can take out and flip it against you.

**Richard Howells:** There's a pretty good chance there is something you can flip it against them as well.

**Nicole Smythe:** Well, it's awesome to see too, because you're dealing with Gen Z right now, especially the age in college and everything. And I really feel like they're the generation that has put such a focus on sustainability and being environmentally friendly and being more conscious with their decisions as a consumer.

So, you know, you're starting to see a lot more people thrifting instead of buying from major retailers. They want to buy reusable packaging instead of one-use packaging, things like that. But I think, like you said, it's also on a corporate level that then trickles down into the consumer rather than vice versa. But it's really great to see companies becoming more and more aware of how much of a focus they're putting on this now. So I can only, hopefully, see that companies are starting to shift to that.

But kind of in regards to sustainability, you know, you brought up a lot of different topics when you are a TEDx speaker too. You know, you've worn a lot of hats and one of them is being a speaker. And touching into the technologies that could promote the sustainability priority or any other type of ideas that they're trying to drive, such as IoT, blockchain, machine learning. How do you see these playing the biggest role in addressing those priorities moving forward?

**Justin Goldston:** So, yeah, on that TEDx discussion, I'm actually going to India to do a TEDx talk at the university in India. I'm actually going to do a discussion on the positive impacts of the metaverse in that talk.

So I'm big in Web3. And, you know, you're going to ask 10 different people what the definition of Web3 is, you're going to get 10 different answers. With me, Web3 is the culmination of blockchain, artificial intelligence, and an internet of things, right? If we all look at these technologies, and look how we can see the positive impacts of these technologies, then they're actually going to make a positive impact in the world. Not just from an environmental perspective, but from a societal perspective as well.

So, for example, I'm taking a systems thinking approach to the Metaverse where we can actually take IoT devices and track and trace. So, for example, a Metaverse in businesses, IoT devices on machinery. I have a digital twin in the Metaverse. All that stuff gets fed into the Metaverse, all of it's visible. It could be visible to everyone or I could have a hybrid type blockchain, right? Or a hybrid Metaverse. So now I use that IoT device, and now all that information is transparent in the Metaverse, now all that information is getting written to the blockchain. Now, because the SEC is going to be requiring public companies to document their sustainability policies. You know, once the auditors come in, Hey, Mr. Auditor, everything's on the blockchain. Here you go. You don't even have to come here. Everything's transparent.

So, all those technologies are going to make a positive impact. And then if you use artificial intelligence, if you use demand sensing, now, not only are you going to be able to have a positive impact on your bottom line, but you're also reducing waste because now you're actually reducing your forecast error. So now you're not writing off as much product, you know, due to obsolescence and expiration and things like that.

So once you combine all these technologies, you take all these buzzwords and you combine into one, then you have a positive impact from an environmental perspective, a societal perspective, and a profit perspective. Because now you can take those profits and now you can pay for people's health insurance. Now you can pay for people's daycare.

Now you can build a cafeteria within the building because I used that example in my classes this week. Where one organization built a cafeteria on their campuses and from an investor perspective, I say, why are you building this and why is the food free? And I said, look, this campus has 10,000 people. You going to have 10,000 people leaving at the same time, everyday, trying to go to 15 restaurants in the area. You're going to have two hours of people trying to get out and get back every single day. So now if you go to cafeteria and it's free and they can go down anytime they want to, how much more efficient are those people gonna be? Right? Now you're increasing efficiency by 10,000 hours a day. A day. And now you're building a gym - what most people do whenever they leave work, most people go to the gym. So now they're working longer because all I have to do is go downstairs. I've saved two hours for every single employee, I've saved 20,000 hours every week. And then I said, okay, that's just one campus for this company. They have 15 campuses around the world. They're getting that much more efficiency just from a cafeteria and a gym? And now the employees love them. Wow.

**Nicole Smythe:** I've heard horror stories of some friends that live in cities and, you know, same type of thing. They don't have the cafeteria, those amenities, and they're waiting an hour and a half, like you said, two hours to get a salad. And by the time they get the salad, get to eat it, it's past lunchtime. You don't have any time to even focus and recharge for the afternoon

**Justin Goldston:** I'm grumpy to rest of the day, so I'm useless the rest of the day. I'm mad, I'm hungry.

**Nicole Smythe:** Exactly. You get hangry. You get the hangry employees. It's the last thing you want.

So, but kind of shifting in, you know, to another hat as we say that you wear is your professor hat. So, your position at Penn State University and with the Smeal School of Business being one of the top supply chain management programs in the country, how are you seeing supply chains evolving in academics?

Especially with the shift in importance and knowledge of supply chain within the past two to three years?

Because even before probably 2020, I would say the majority of Americans probably did not know what supply chain was, or if they did, it was probably a very, very small inkling as to what it was. So now with that shift, like I said, how are you seeing the evolution in academics?

**Justin Goldston:** I would say that post-pandemic, you're seeing a lot of collaboration with industry and academia. You're seeing a big shift. We had it before, yes. But after the pandemic, you're seeing a lot more organizations reach out to higher education. We're seeing it at Penn State, I'm seeing that Georgetown as well.

So, you're seeing increased collaboration. And this was one thing that I was kind of afraid of during COVID, where you've seen people working together, you've seen FedEx and UPS working together on the distribution of the vaccines, where it's like, this is amazing, but my fear is we're going to go back to business as usual once this thing is over with. We've seen the same thing during 9/11 - everybody came together, but then once everything died down, they went back to competition, right? I just hope this does not happen whenever we kind of go back to business as usual; we hadn't got back to business as usual, so I'm still waiting to see, I'm still evaluating. But I think this one's going to be better because people see the importance of collaboration from a supply chain management perspective.

And with that increased collaboration among industry and academia, I think that you're further contributing to the body of knowledge. In that now, you know people who write books. So, me and a few peers of mine just had a book published on blockchain by Taylor and Francis, . And even with that book, we're working with blockchain protocols to understand what their issues are because they see the importance of collaborating with academia. So within supply chain management, they see the importance of not only for journal articles, but also for textbooks as well. And now with that, the students are better equipped to enter into the business world.

And I always talk about my marketing majors, I always say, make sure that once you leave here, you are abreast with social media. Penn State's doing a better job of integrating social media within the curriculum, but I say you have to go outside of that. First assignment, first week and every single class: create a LinkedIn profile, right? But I always say create LinkedIn profile and then I always include LinkedIn learnings into my assignments. And I say once you create LinkedIn profile, put that learning badge on LinkedIn, because those recruiters, that's the first place they look. When someone reaches out to me via email, first place I look is LinkedIn to see if a person's legit. Right? That's the importance of networking and social media.

I said, it's one of the most important things that you have to tell undergraduate students. You know, they can communicate how they want to with their friends, just for fun, just for giggles. But they don't really understand the power of social media and networking.

**Richard Howells:** So as a follow up question to that, I have kids in college and my youngest is finishing college this year and he sure as hell doesn't listen to me, so maybe he'll listen to you. What advice would you give students looking to move into the supply chain space?

**Justin Goldston:** So one of my peers, Brian Laung, he teaches at NYU. And he has his quote: the world is a supply chain. Right? So one thing that I ask my students, I do a lot of exercises, but one thing I explain

is regardless of what you're interested in, every single organization is involved in supply chain in one way, shape or form.

I say, find what you're interested in and then you can be doing what you love, and then you can also integrate the supply chain where everyone needs it. And I always say, if you like money, it's a pretty lucrative position too, right?

**Richard Howells:** I could use that one with my son. He'd listen to me then.

**Justin Goldston:** Yeah. I said, you don't have to listen to me, I said, go online right now and say average supply chain salaries. They say, Ooh. Yeah, exactly.

But, a couple weeks ago, you know, I was going around a class, I said, somebody give me one of your hobbies. Guy said, 'video games'. Okay. Whenever you make video games, whenever you make video game platforms, you need chips, now, don't cha? Yeah! I said that was one of the big issues in the supply chain perspective was chips. So you can actually go work for Sony, you can go work for Microsoft, and then not only are you going to be able to start working with the games then you're going to be working in a supply chain department, right?

Okay, you can work at Blizzard. How long does it normally take for them to market a particular game? Overwatch or something like that. But he was like, yeah, Overwatch 2 came out. I said, okay, how long did they market that product? He's like, oh, a couple months. As they are marketing that product, they have to figure out, first of all, how many of that Overwatch game they have to produce, and then they have to figure out where they're going to distribute that Overwatch game around the world. I said, now you're actually in the Overwatch ecosystem and now you have a big impact in terms of how the Overwatch game is going to be distributed around the world. I said, just imagine everyone opening up the Overwatch game at Christmas, and you're sitting back looking at your girlfriend or wife, saying, 'yeah, I did that! It's because of me that game got to Australia.' Yep. You know, so.

And then another one, you know, she was like, 'oh, I like the bake'. Okay, I used to work with an organization, they manufactured salt. I said that salt came on a rail truck, they got dumped out at the manufacturing facility, got processed, put in these big hoppers, and then got distributed to all these manufacturers. I said, you don't have to do it at that scale, but if you use social media and you talk about all your baking, now you might get a distribution deal on making your cakes. Now, to get that distribution deal for Walmart, you have to figure out where you're going to distribute to what Walmart DC's, as an entrepreneur. I said, I just talked about two examples that you didn't think had nothing to do with supply chain, but has everything to do with supply chain.

**Richard Howells:** Because everything is to do with supply chain. I wish I had a lecturer like you when I was in college, and I think I can get away with saying that because all the lectures that I had were probably dead by now so they won't mind. (laughs) Because you're bringing real world examples into every conversation.

We're at the end of the podcast actually, which I thought it would go quick when you started talking, but I didn't realize how quick.

**Justin Goldston:** I knew it wasn't going go quick. (laughs)

**Richard Howells:** But we ask everybody this question, so I'm sure you can give us a great answer. So in, in a few sentences, if you had to summarize what the future of supply chain is, what is the future of supply chain, from your perspective?

**Justin Goldston:** Oh boy. Oh boy. I say that the future of supply chain, in my opinion, it is going to include automation, meaning, you know, robotics. I'm also throwing artificial intelligence and machine learning into that automation part. I hope that it leads to decentralization. Because decentralization will require increased collaboration, it will require increased transparency. But I think consumer wants and needs will further be driven, you know, by the increased transparency. These emerging technologies that we're talking about right now, if used a correct way, I think you're going to see a positive impact.

So I think that the future is systems thinking. You have IoT, that's going to give you all of the information on the machinery. It's going to lead into predictive maintenance, which is going to include artificial intelligence. And then you have, you know, sustainability where you can track the emissions from all your plants, and distribution centers, and your equipment, and your trucks, right? And then all that stuff can be transparent.

That's my utopian future.

**Richard Howells:** Justin, this has been a great conversation. Thanks very much for spending the time and sharing your thoughts. I'm sure everyone listening will echo what I'm saying.

**Justin Goldston:** I hope it was helpful.

**Nicole Smythe:** Absolutely.

**Richard Howells:** So, I'd like to thank Justin and I'd like to thank everyone for listening as well. Please mark us as a favorite so you can get regular updates and information about future episodes. And until next time, from Nicole and I, thank you for discussing the Future of Supply Chain.