Episode 142: Sustainability by Design — Exploring AI, Supply Chain & Finance

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Richard: Welcome to the Future of Supply Chain, a podcast where we discuss hot topics, best practices, and the latest innovations in today's global business. In this week's episode, I'm joined by Darcy MacClaren and Prathiba David to discuss the topic sustainability by design and how aI leveraged collaboration redefines large scale physical operations. So maybe Darcy, I can start with you. I know we've known each other for quite a while, but maybe you can introduce yourself and your current role to the listeners.

Darcy: Certainly. Well, Richard, thanks for having both [00:01:00] of us on. I'm a big fan of your podcast. I have about 25 years of experience leading strategy, and go to market for innovative supply chain And logistics technology companies. And I was with SAP for over 13 years through april of 2025. And there I was, global Chief Revenue Office for this supply chain team. Today I serve as senior advisor to several supply chain technology companies. And I also sit on the board of 1Logtech , which is a very exciting AI-driven logistics platform. And the focus that I have is really helping organizations to build smarter, think AI, more resilient, more sustainable supply chain. And we're excited to be here to talk about something that we're both care and are very passionate about.

Richard: Great to have you. And Prathiba?

Prathiba: Thanks for having me on, Richard. My name is Prathiba David. My background is across Morgan Stanley, EY, Dropbox, et cetera. And then more recently I have been [00:02:00] doing go to market with sustainability startup. I focus today on how digital tools and AI can help organizations make sustainability more measurable and business driven. And I do advisory for companies. Thanks for having me.

Richard: No problem. Welcome to the podcast. I think we all agree that sustainability can't be an afterthought and it can't be a side project for any company in today's environment. So how does the concept of sustainability by design represent a fundamental shift from traditional reactive sustainability approaches into a large scale physical operations, maybe Prathiba I'll start with you.

Prathiba: Sounds good. Well, as you mentioned, RI Richard sustainability. Generally speaking, most companies look at it as a reactive. Stance and they report emissions after the fact for compliance or try to buy offsets for design decisions they've already made in the past, so they don't actually get to see the business. Benefits of sustainability and sustainability [00:03:00] remains as a cost center. Sustainability by design as a concept flips that model. So they embed environmental, financial, and operational considerations at the very start of the process and then embedded across the value chain of the company. So, take Apple for example. They redesigned. All of their product materials and packaging to be using more recycled materials or fiber-based packaging and eliminated a lot of waste, millions of pounds of waste before products ever hit the supply chain. So that's sustainability by design as a concept.

Richard: Darcy, any thoughts?

Darcy: I fully agree with everything that was just said. And if you look at the supply chain 80% of emissions are actually locked in early during the product design, the sourcing phase, the initial network setup. So if you take sustainability into those decisions, everything design downstream becomes cleaner, more efficient, and cheaper to operate. [00:04:00] So sustainability by design is really all about instead of fixing the problem at the end. It's being forward thinking, so companies are totally redesigning their operations from the ground up. and sustainability principles at the on onset through design to operation can really achieve these huge carbon reductions while unlocking the financial and operational efficiency. So it really needs to be reframed from just seen as environmental, right? And an ethical obligation. And a regulatory obligation to really be considered. and this is the big change a core business strategy. That's the change now. And when I think of examples when I think of is ikea. Most of us have been through an iKEA large store. You have to weave through your way to get to the end, and at the end you see a, you find a huge warehouse where you're supposed to pick up all your boxes. Well, what iKEA did is they redesigned their packaging to reduce the cubic [00:05:00] volume, and by doing that, they cut transportation admissions and save million in logistics costs. So that's the same about all the way about sustainability

becoming a business strategy and not just a reporting exercise and something that is basically statutory.

Richard: That's a great example of sustainability being good for the environment and good for the business, and reducing the amount of miles that need to be driven through less truckloads. My next question is really about the why now. I mean, everyone's talked about sustainability for years, but what's driving the urgencies for companies to embed sustainability into the supply chain design? Is it regulations that you talked about a little earlier? Is it's shareholder pressure? Stakeholder pressure, employee pressure, or simply good business strategy? Maybe Darcy you could take that one.

Darcy: Yeah I'll start with this one. So right now, of course you mentioned they have to be regulatory requirements and that's [00:06:00] globally they all vary and they're quite complex and they have to meet them, but. On the operations side, supply chains are under immense pressure like never before,. And we all know what they are. It's climate disruption. It is rising transportation costs, it's labor shortages. It's tariffs and inefficiency and the supply chain isn't just an in inconvenience anymore, it's expensive. So take the regulatory and take the supply chain disruption and what's happening now is the good news the technology now today enables companies to bring it all together, like take SAP, for example, the design to operate structure, which is an end-to-end supply chain framework that connects every phase of the product lifecycle from initial design, manufacturing, deliver an ongoing operation. In simple terms, the full digital thread across the supply chain gives company visibility and controls every step. Now, we add to that [00:07:00] solutions like SBS Green Ledger for sustainability tracking. Combined with the advanced AI capabilities, a company can finally integrate operation sustainability and intelligent into one cohesive system. and it's that kind of end-to-end visibility and agility that supply chains have needed for years, and the technology is making that role possible. Now the example I like on this one, 'cause we do like to use example, let's prove out these points, is Walmart has a project, I love the name, it's called Gigaton. Great example. They pushed their optimization fleet routes. With ai, it wasn't about being green, it was about reducing miles and cost. It ended up reducing admissions too. Walmart reached the Project Gigaton Milestone, which was one gigaton of supply chain emission, reduced and or avoided within six years, all by mobilizing [00:08:00] vendors. The data, the incentive, the playbooks providing supplier engagements that can drive scope three outcomes at scale. Pretty impressive, and other companies are able to do this as well. So to answer the question, it was a combination of regulation. The need for supply chain efficiency and technology coming together, which is why we have this why now.

Prathiba: Yeah. and to add to Darcy's point on regulations measurement and reporting of Scope three emissions is becoming mandated in 2026 in Europe, California, as well as the SEC as well. Here back in the United states and Scope three emissions are emissions related to the supply chain of the company. And this is driving the need for carbon performance. That's tied to procurement eligibility as well as access to capital. Now we saw with the recent COP three COP 30, we have large investors like pension funds still coming out and saying, yes, you do need to report on your emissions. We do want better [00:09:00] carbon performance, et cetera. So, adding to Darcy's point on the regulation aspect, it's the returns as well that's driving this particular shift.

Richard: Those Scope three emissions are the most challenging to capture because Scope one and two, you have some what control of it's within your organization, but scope three, it becomes a team game. You've gotta get data from your partners and multiple tiers within the supply chain. When we talk about complex supply chains.

Prathiba: Yes, a hundred percent. Because companies cannot control most of the data related to Scope Three. And Scope three lives across thousands of suppliers and logistics partners, right? And then, and on top of it all, they all use fragmented systems. And there's no single way to collect all this data and it ends up being manual. And many still set data in spreadsheets or PDFs.

Richard: So Prathiba, Darcy opened the door to the next question for me because we made it about six and a half minutes before somebody mentioned ai, [00:10:00] which is by no means a record on this podcast. We always end up talking about AI at some point.

Prathiba: Yep.

Richard: So, so I'll, maybe I'll pose this question to you to start with. How can AI and predictive analytics transform supply chain management to not only reduce carbon emissions, but also drive financial efficiency and resilience?

Prathiba: Yeah, absolutely. I'm glad we brought up ai within the first 10 minute mark, but AI brings this level of visibility to companies. That they have never seen before. So it's unprecedented level of insight into, for example, looking deep into the supply chain and zeroing in on where the emissions are exactly coming from, right?

Or being able to model product design choices to understand where the biggest impact when it comes to environment and financial impact are coming from.

Right? And this is data that. Decision makers did not have before. And because of this data availability and [00:11:00] being able to zero in on this type of data the decisions being made is much more informed.

So take Unilever's digital twins, for example. What they've done is they've used AI to simulate product and packaging choices, and the simulation modeled carbon cost and waste implications instantly. So it changes the game on how decisions are being made.

Richard: Darcy

Darcy: I'll add to it because you gave a great intro to this, and it's really AI, it its core to acceleration of this whole concept across design to operate for sustainability with the framework, because it's embedded in every step of the design to operate lifecycle. And it really creates the more autonomous, predictive, and resilient supply chain.

So real specific areas where we see AI can have a huge impact is we're seeing in, we've already talked about dynamic route [00:12:00] optimization. We see it in predictive ETS. We see it in real-time visibility that reduces the empty miles. We talked a lot about the digital twin. Those are great examples of how AI can really help really combine the efficiency and the sustainability all in one time. And Merc, for example, large global logistics service provider. They use it to optimize freight flows, which reduces carbon and improves vessel utilization, and in many cases it's the most sustainable option is also the most cost effective option. And that's the sort of impact we're seeing by embedding AI throughout your whole supply chain process.

Richard: Do you think AI is replacing some people when it comes to. Defining sustainability rules, or is it just a tool that we're using that can leverage this vast amounts of data that is now available from all areas of the supply chain, not [00:13:00] just for sustainability, but for all business benefits?

Darcy: Yes. I think in general what we're seeing with AI is it does have the ability to reduce the certain number of people to do certain tasks that are no longer needed. That can be done by the ai, but more important it's that the jobs are changing very fast within supply chain, it's not all about assembling the data, figuring out the data, it's reacting, it's looking at the scenarios, it's making some decisions.

So it's more of a redefinition of what a supply chain practitioner does in a job where you do have the benefit of having AI as a copilot. So the concept of

having an autonomous supply chain, which hands off, which is running everything in the most sustainable economic way is pretty far off and some people don't think we'll really ever get there, but it's man and machine working together in the most sustainable, efficient way. So jobs [00:14:00] are changing but yes, to do certain jobs we probably do not need as many people we had before, given we're gonna be automating some of the tasks.

Richard: Right.

Prathiba: Yeah I would agree with that. I think what AI does is convert manual rote labor that people have to do into decision makers, right? Like, you end up being more of a decision maker as an employee rather than doing rote work. And it also gives access to additional data that you never would have if we had just gone the manual route. So I look at AI more of an enabler. Rather than something that comes and takes away a person's job. And to Darcy's point, it just shifts. It shifts job to be more cerebral, is how I think about it.

Darcy: And I think the reality is that people now realize the job has just gotten too big, too complex, too much data, You cannot do it. You just cannot, the old, experience and gut is too much out there. You need these two to help [00:15:00] facilitate it, and they can do it much quicker, better, faster.

Richard: Could not agree more. I wanna go back to the discussion around Scope three emissions because it's always more difficult to capture that information from third parties. And how do we move from the estimating on doing it based on estimates to doing it, based on actuals for reporting based on actuals.

So what challenges do companies face in measuring and managing these upstream and downstream emissions? Maybe Prathiba we start with you again.

Prathiba: Sure. So like we discussed a bit earlier it's about not being able to control the data and not being able to control the quality of the data coming in because it's coming from thousands of suppliers. The formats are different. The quality of the data is different. You don't really know if they're doing all the things necessary to measure the data, and that is the hard part when it comes to scope three, but I'll hand it over to Darcy for more insights.

Darcy: Yeah, it's just to to [00:16:00] reiterate, it's just because of getting these datas and spreadsheet and PDFs and such what's interesting is the one company that I'm on the board of 1Logtech is trying to solve this problem by getting the information and make it easy to integrate, get it real time. So that is as much

easier to get accurate information directly from the source to allow you to do this tier three type meaning.

And I think one of the company that does it this best and I'm probably not surprised, is Microsoft. Because they're big enough and they have enough clout. They require suppliers to fully verify emissions data and it's reshaping their entire ecosystem. So I think it will continue to be a challenge, but I think as we get improved ways to get the data in as we have companies that are in the position of power to insist, I think we're gonna do a much better job. But it is bottom line, you are correct. Scope three is hard. But I think we can improve it, making it a little bit easier to do a better job at it.

Richard: Well, the good news, I guess is that one person's [00:17:00] scope three emission is another person's scope one emisions.

So they have to capture it for themselves anyway. But are you seeing companies put into their contracts with suppliers? The need for that data? Are

Darcy: Absolutely.

Richard: based on that?

Darcy: Absolutely. And when sourcing for products, companies will have that as a qualification. And the larger vendor you are for a certain resource you're trying to procure, the more likely to get that. So it will become more of the norm. So it won't be just the Microsofts of the world, but it will be in all the other ones. I definitely think, and there are ways such as if you look at the, Ariba and the large, some of the other large procurement things, they have the ability to do that as part of the sourcing decision.

Prathiba: Yeah. And to add to that, like with the regulations coming into play, we find, for example, in california businesses scrambling to try and get this Scope three data. And so going forward it is going to be a thing that is part of the contract that is required as part of your [00:18:00] procurement process as well, much like you do with security metrics or cybersecurity metrics to be specific.

Richard: I'd like to think that we're moving from an environment where we have to do it because the regulatory bodies are saying to do it to one where we want to do it. It's the right thing to do from the business. So how do we measure success beyond emissions reductions what metrics of business outcomes best

demonstrate the impact of sustainable supply chain design? Maybe Prathiba that's one for you to start with.

Prathiba: Sure. Success, I believe, is when you can align your sustainability metrics with your business metrics, with your financial performance, and it's all aligned together. So you should be able to see lower energy costs, for example, or reduced waste, better efficiency in logistics and transportation. And as well as access to sustainable finance with lower cost of capital. You should be able to see these types of financial metrics beginning to [00:19:00] come to bear as you embed sustainability in your design decisions, and you align new metrics along with business metrics as well. So, like Schneider Electric, for example, did a great job in having success with sustainability they put out their AI driven solution and saved up to 40% in energy costs. Now, that's huge, 40% and cut emissions and all, all by redesigning their operations with sustainability and financial performance in mind.

Richard: And I'm assuming that just as good customer service as well, I assume not at the detriment of something else, Darcy?

Darcy: Sure. I'll take it from the operations side where there's significant success, higher fill rates. Are one of the benefits that you receive fewer disruptions. We have a more predictable transportation. We reduce transportation miles. We haven't talked a lot about the manufacturing process, but [00:20:00] if you take sustainability mine when you're designing how the processes for manufacturing your product.

You absolutely will see reduced carbon footprint. If you take a look at how you're manufacturing your process, your products, and what you need to do to improve those. So in every step, whether it's the materials that you use, making sure you're getting them from a sustainable vendor, bringing them in a sustainable logistics way, manufacturing it, reducing and improving sustainability at the same time, lowering the cost by looking at your manufacturing process and the equipment that's doing it right through the delivery. So every step along the way in the operation side we've had huge successes, which is why it's become a business strategy to do this. it's sustainable, but it's also cost effective in pulling these together, in this cross-functional collaboration to really transform sustainability from a compliance exercise to an expense, [00:21:00] joint value situation.

Richard: So we've talked about the benefits and it's obvious that we should be doing something around sustainability. So what are the barriers to change? Is it technology? Is it the data? Is it senior leadership and company alignment, or the

culture in general? And how do we overcome some of these barriers? Maybe Darcy, that's one for you.

Darcy: This is probably Richard the number one thing that I talk about, and I've been having this conversation for a number of years, it's silos, it's operational silos where organizations really need to get out of their silos at the operational level and adjust the organizational metrics to make this behavior possible. So by that procurement has different goals than the logistics folks, the warehousing folks, the planning folks. And when you have different goals you're going to [00:22:00] come up with different decisions. So what you need to do at the senior level is really look at your organizational structure and make sure it aligns so that you could look holistically across your supply chain and the value chain.

And not have sustainability sit on the outside of the mall, which is what the problem is now. Everybody owns it, and when everybody owns something, nobody owns it. So it's really about getting rid of the silos, redoing the organizational metrics, senior leadership to really understand what we're trying to do here. And that's where companies get stuck because without collaboration, progress stalls. So that's the number one thing I see.

Prathiba: Yeah. And to add to Darcy's point, it's also availability of data for them to be able to break out of their silos, that kind of verifiable data. If available to sustainability teams, what they can do is they can make financial use cases from that data and [00:23:00] being able to pull the CFOs or the COOs using this data 'cause CFOs, as we know they need numbers. You can't just have good intentions. But the good news is that once we start building this unified data model and foundation, momentum can begin to build quickly.

Richard: So let's follow on with from that Momentum Build Wish. You've talked about that foundation of data, which is a good place to start, but for organizations that want to move from reactive sustainability to sustainability by design, what's the most practical first step or pilot initiatives that you are seeing companies taking that you recommend companies taking?

Prathiba: Yeah, absolutely. To your point, you mentioned cutting across silos, right, like start with forming a committee or a task force that is cross-functional and cuts across into operations, finance, sustainability teams, procurement teams, et cetera. And start by picking out one or two high impact projects that connects [00:24:00] carbon with cost.

So an example could be an energy optimization inside a facility like the way Schneider did, or a supplier valuation with real carbon insights. Being now available from all of those different systems we have, or creating a digital carbon ledger that's connected to finance systems. It could be any one of these things. It could be something smaller because small wins build credibility.

Darcy: Yeah I'll add to that because that is spot on. What I think in looking at your organization on where to start, what's important is to look at either the areas where you have the most pain that you think you could get the most benefit and then start there. And that answer can be different in different organizations, but a commonplace which has a lot of value and you can get quick wins. What I'm seeing right now, quite frankly, is in the logistics area. Where you look at route optimization and you can deliver [00:25:00] results in as little as 90 days, and that gets momentum going for the project to roll out into the other areas because it's fewer miles, lower fuel costs, lower admissions. So it all ties together, and this is exactly what UPS did in there I love these names companies have for their projects, the No Left Turn strategy, which seems so simple. But it saved millions of gallons of fuel and cut thousands of tons of CO2, which was good for the environment and good for UPS's bottom line, so it start small, prove value, scale fast. Rinse, ladder, repeat. That's my view.

Richard: and for those listening to in the uk, it would be no right turns,

Darcy: ah, that's right. Oh, I should made it global. Good catch. Good catch.

Richard: But that's such a simple thing. And as you say it reduces the miles, it reduces the emissions.

Darcy: Oh, exactly. Exactly.

Richard: So we're coming to the end of the podcast and I ask the same question to all of my guests [00:26:00] or victims, depending on how you look at how this has gone from your perspective.

So how do you envisage. Supply chains evolving over the next, say five years as technology finance and sustainability continues to converge, and specifically from a sustainability and AI enabled supply chain perspective, what is the future of supply chain? So Darcy, maybe you could take that one first.

Darcy: Sure. I always love this question. So to me, supply chains of the future, they will be AI powered, predictive, autonomous, sustainable, and deeply connected. And companies that adopt, designed to operate with embedded AI

will run supply chains that are 46% more automated. Far more resilient to disruptions and sustainability embedded, not reported after.

So in summary, the winners of the future will be the ones who can sense, simulate and respond instantly, whether they're competitive advantage, [00:27:00] being responsible, and they're gonna be rewarded financially. That to me is what we'll see in the future of supply chain in the next three to five years.

Richard: Great summary, Prathiba any thoughts from your side?

Prathiba: Absolutely 100% agree with Darcy. I think finance, operations and sustainability, et cetera, will have that breaking down of silos and it'll be able to convene around that single shared data model we talked about. And think of it as a single command center where all of these different silos can operate from, but also having that real time visibility of on carbon impact, on, on how that impacts financial decisions and so on.

You'll be able to see it as a live model and being able to pull levers in an instant and investment decisions will model both carbon and cost together. That's what I see. And then we're evolving towards a resilient, intelligent, and circular supply chain. And to Darcy's point, sustainability isn't just an [00:28:00] add-on, it's fundamental to the operating model.

Richard: Darcy, Prathiba thanks for a great conversation. It's been really interesting.

Prathiba: Thank you, Richard.

Richard: Darcy, it's been a long time coming from your perspective as well. I'll make sure to include additional links to an article that I know you've written recently in the show notes so that everyone can look out for that. But until next time, from Darcy, Prathiba and I, thanks for discussing the future of supply chain.