The Future of SC, Episode 164: AI, Innovation, and Humanitarian Logistics: Inside the World Food Programme's Supply Chain with Bernhard Kowatsch

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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. I'm Richard Howells, and I'm joined by my wonderful co-host, Sin.

Sin: Thanks a lot, Richard. And also from my side, hello, everyone. My name is Sin To. And in today's podcast episode, we will talk about the most complex supply chains on this planet. I do think so. It is the humanitarian logistics. And for this special topic, we have invited a true expert in this field, Bernhard Kowatsch, Director of Global Accelerator and Ventures at the UN World Food Programme.

And for those [00:01:00] who may don't know the World Food Programme, this is an organization that operates the world's largest humanitarian supply chain, delivering food and assistance at global scale, often under extreme constraints. So with Bernhard, we will talk about what it takes to plan and execute logistics across land, air, and sea, and how digital tools and AI are changing decisions upstream, and how the World Food Programme's Innovation Accelerator in Munich partners with corporates and startups to scale solutions faster.

So first of all, welcome, Bernhard. And before we jump in, could you please take a moment to introduce yourself and your role at the World Food Programme organization?

Bernhard: It's a great pleasure to be here. Thank you for having me. I'm the Director of Global Accelerator and Ventures, as we call it, at the World Food Programme, so this is our global innovation team working with startups, NGOs,

but also internal innovations at the World Food Programme, specifically with our country operations.

So whenever you [00:02:00] hear in the news the UN delivers food, whether that's in Ukraine, whether that's in Gaza, in Venezuela, or in Colombia it's the World Food Programme with about 1,000 partners. And our team here, we work with colleagues in those countries in startups and innovations to make those emergency assistance more efficient and effective but also sustainably ending hunger, working with startups, with investors. And we not only do this for World Food Programme but now also for different other global partners, like governments different global problems, mostly in the Global South.

Sin: Thank you so much. So let's just start with the state of the world, as the global context is extremely volatile, conflicts and climate events are intensifying need. So to start with which crisis patterns are currently most disruptive to humanitarian supply chains, and how does the World Food Programme adapt its network design and response?

Bernhard: Yeah. The unfortunate truth is that [00:03:00] right now, and this is now going on for a couple of years acute hunger is unfortunately rising. So and this is due to conflicts which we see for instance like in Ukraine. It's also because of extreme weather events, climate change but also economic shocks, whether this is now COVID, whether this is the closure of the Strait of Hormuz, whether there's different other aspects.

And this is really where in the aspect of fighting hunger, a lot of times when we talk about acute hunger, so this is people marching towards starvation. Pre-COVID the number of acutely hungry people was 85 million. Right now that's over 300 million, so 320, 318 million people. And that's something which often goes unnoticed, but it's a challenge that's happening right now which is the root cause or the mission of that we have as a World Food Programme.

And what that also means that in terms of supply chains, of course it gets even more complex because when there's not enough food in markets, we procure, [00:04:00] transport the food into those countries, into those remote areas where food is needed. Because oftentimes, if it's in the middle of a conflict zone, you don't actually have food in those places.

And if there's enough food in markets, people need to be able to afford it, and like this is where like a lot of these disruptions, price changes, of course again affect people who are already suffering from poverty, suffering from hunger,

again another time or even more than what you would see in some developed countries.

Richard: That statistic you just mentioned of it was 85 million people and it's increased to 318 million in the past five years is a scary and both a disappointing and concerning statistic. And it just adds to the complexities you said of what you do on a daily basis. And the World Food Programme is known to be the biggest humanitarian organization as Sin pointed out, in the world.

And so I want to ask you, as the largest humanitarian supply chain in the world what [00:05:00] defines characteristics of scale here? Is it volume, speed, reach, or volatility as you mentioned a little earlier? And where does the complexity show up first?

Bernhard: This is, like, where, coming from the emergency response side, it's the same way you can imagine like, you know, a first responder or, like an ambulance. Like, you have an accident on the street and an ambulance comes, picks you up.

So, like, when there's a natural disaster, when there's a war speed is of the essence, because you need to get the food to the people because they are starving right now, right? Now, the other aspect is speed, it's costs, but then it's also about, like, the complexities, specifically in a global operation, also in remote or rural areas.

It's one thing to say to be operating in an urban environment that's connected to roads and infrastructure, or you're in remote areas where the infrastructure roads or take the example of earthquakes or typhoons or hurricanes, the infrastructure has been washed away.

Yeah. This is where typically ... So , we prioritize [00:06:00] the most vulnerable people first, which means that in order, we need to know where are those people, where are the most hungry people and how to get there in the best possible way so that every euro or every dollar donated the maximum of that is ending up with the people that it's intended for.

Sin: So, if we now also talk a little about the planning under uncertainty. If you compare now the commercial planning, which needs to, which has a different aim and target and and goal of making a lot of, let's say, yeah, money how do you plan then for the humanitarian supply chains? How do you react to shocks? And how do you approach planning when needs can spike overnight and access

can challenge on a daily basis, which is not the case in the commercial supply chain?

Bernhard: I guess you might have some of that also commercial supply chain. You would hope not as much.

But so let's say is our supply chain is complex. We, World Food Programme, so we [00:07:00] operate in about 120 countries and territories in the world. And that's some of the most complex situation that you can imagine also from a, whether this is stability, whether it's war, whether it's infrastructure perspective.

And then imagine five and a half thousand trucks could be around like, you know, 200 ships and like 55 airplanes. So this is essentially the supply chain networks that we're operating across the globe. And what's driving a lot of the ... I would say there's probably different aspects of the demand side, like the understanding where the needs are, where the hunger is.

So, like we need to be fast in that, and we're using artificial intelligence for not only having real-time data for food security, but also forecasting food security. So, like looking into the future, like how is hunger going to evolve? Like where are the needs going to rise up to 60 days in the future.

And then you go into supply chain planning, where it's about uh, you're actually looking into, all the combinations. If we buy food from a thousand vendors worldwide we've developed a tool called Scout. [00:08:00] The, our supply chain colleagues did that, where it's essentially it's looking into, where do we buy from? Do we buy right now, in a month, three months, six months from now? In which warehouse do we store? How do we optimize the routes into a country? And then in any of the country operation, we have centralized control towers essentially to look into okay, how do we plan and then optimize the routes also within a country.

And so like you can imagine that in any of these circumstances we're trying to have the most cost efficient, at the same time fastest delivery. Now again, like which is geared towards when the food needs to arrive and then you essentially plan towards okay, where do we buy the most cost-efficient basket that at the same time is optimizing for the speed and even like may reducing, for instance, like airplane or emergency flights and having like other transport options, right?

Richard: That sort of summarizes the complexity that you're dealing with and you've been dealing with this, [00:09:00] the complexity that, and disruptions that that businesses are now dealing with on a regular basis way before it was

the norm. Before the COVID pandemic, you still had to deal with these disruptions these environments of change and complexity. And you mentioned that you leverage AI, advanced analytics, digital platform, the planning systems that you mentioned and manage risk. But what does a modern digital humanitarian supply chain look like in practice, and which decisions can you rely on the technology, the data-driven end-to-end processes?

And where do you still rely on a human judgment because the environment is so dynamic to make that decision of balancing cost- effectiveness and speed because you have to get the goods there in some cases despite of the increased costs.

Bernhard: No, and I, think this is where [00:10:00] it is very relevant also to think about, like, how you're designing tools, innovations specifically now that we're also using artificial intelligence.

World Food Programme we've used artificial intelligence for years so there's like, and I would argue that we are on the course of using even more of that. Sometimes it's investments that World Food Programme has taken years ago that now paying off.

It's like years ago we invested in essentially warehousing ERP systems to have real-time stock levels for all our warehouses across the globe. The same way we invested in a centralized data lake to have the data available that and the price data that now allows us to actually build these types of optimization model.

Now, typically for us it's always about responsible AI. And this goes in different directions. One is to make sure that, the models don't have any unintended biases or we need essentially leave no one behind, which is actually quite relevant because we often work in in rural areas, we work in areas that have less [00:11:00] access, so to make sure that, the data we have it's the right data and that all of that is in place.

And then at the same time in terms of decision making typically the systems would be designed there would be different options or recommendation, and then you have a human who is essentially deciding that. And then, it goes into different complexities. There's elements that you can do more on the kind of the upstream supply chain, the global planning which happens on a global scale, and then essentially our country operations they are responsible for the optimization within a country.

Richard: I think you've touched on something that's vitally important or relevant to all listeners at the moment, and that's the use of AI. And you've mentioned that you've been leveraging AI for optimization models for several years, and responsible AI, which is another key, and leveraging accurate data from that data model, that data lake that you referred to.

You also talked about the planning system you're using, the Scout system that [00:12:00] you've delivered. But I want to focus on that AI topic. What does it take to make AI actually usable in the field and accepted by decision makers? Because you've been on the leading edge in AI for several years, so how is it accepted within your organization?

Bernhard: So I think this is where having actually the ability the same way for any innovation to prove that it's valuable in solving a real problem. Actually starting with that is very important, where it's not building an AI model for AI's sake. No, because the example for Scout, for instance, is the optimization options in terms of specifically cost versus time. Cost versus time, do we buy now, in three months, in the future? What is the price going to be? Like, where do we store it, which warehouse? There's so many options and we actually calculated this. As a human, you are unable to do this.

Richard: Yeah, you can't compute it in your head.

Bernhard: No. And even historically people would, build Excel models or whatever. It is not possible to do that. Now, this is a perfect example of why AI actually matters and why it makes [00:13:00] sense. And at the same time, because we've World Food Programme has used optimization models for, years, decades, literally we are able to compare the new model versus the old model. And this is also why the Scout tool that we essentially supported our supply chain colleagues to build Scout saved $6 million in the first 18 months of operations, and that's savings realized after all contracting and food was delivered.

How do we know that? Because we have the new model versus the old model. And I think that also gives you reassurance in terms of it's not just a black box and you don't know if it works. In this case, we can quantify the savings. In this case, we're actually estimating we'll save $25 million every single year from now on by using that AI model across the globe. And it's one of those things where it's a lot better or easier to sell once you see the tangible results.

Richard: And it's not just $25 million saved. That $25 million not-for-profit. It'll get reinvested in providing better [00:14:00] services and additional services.

Bernhard: Exactly. So more food for people because as a matter of fact, World Food Programme, we are 100% voluntarily funded by donations, a lot by governments, a lot by also individuals, foundations, corporates. But essentially right now, we are typically between 40 to 50% underfunded. So we have a lot less money than what we would need to just provide food to the most vulnerable people, which means every single euro or dollar that we're saving gets reinvested into more food for people who need it.

Sin: One or two questions, follow-up questions. Yeah. So the first one is: how do you decide who will get or where do you deliver first? Also by using the AI technology to optimize it. And then the second one is: once you have the technology installed, the AI, to do the optimization with humanitarian principles but then mathematically it makes totally sense to [00:15:00] deliver that truck of food supplies to that country. But the other thing is you don't have really access to it because the route are blocked or somehow like this. How do you balance those kind of decision also using AI and then the gut feeling or the decision-making that's right ... based on the experience that you have since years?

Bernhard: No, it's a very good question. To answer your first question, so typically it's the assistance of World Food Programme is prioritized based on needs. So, wherever the need is the highest, these are the people also whether this is pregnant or moms with babies or school meals programs, and then you go into maybe displaced people. You go by vulnerability. And then essentially there's different classifications of in quotation marks, how hungry people are, right? So, this is like where are they moderately hungry? Are they acutely hungry? And there's there's technical specification of how you classify the type of hunger levels.

And so typically then the data is [00:16:00] public, so everybody can actually check this out. There's a tool we have developed in WFP, it's called Hunger Map Live. It's hungermap.wfp.org.

You can zoom into countries and you can see the data in real time essentially changing. Is hunger going up? Is hunger going down also on a regional level in a country? So, we prioritize based on needs. And then in terms of the supply chain planning and the optimization, this is where the unfortunate truth is that let's say the ... Yes, there's challenges sometimes when there is enough food or there's enough money, but we don't have access. That is possible. This can also

be, like, because conflict parties do not stop or, prohibit the humanitarian access from accessing the civilian people, right? That's possible, unfortunately, like that's one of the scenarios.

The other one is a bridge has been washed away by floods or something like that, right? Like then so that is something, or there's flooding specifically in South Sudan is widespread where there's lots of like roads that are impassable like in rainy season. Now and [00:17:00] then essentially like what you do then in any particular country is again, based on like the funding that we have and the food that we have and the cash that we have, we can decide and optimize based on what's the best way how to reach those people.

Now, in emergency settings when nothing else is possible, as last resort, in South Sudan for instance, or also in other extreme cases, we've even done airdrops, so like where you fly an airplane and you drop food out of the back of an airplane. But also with the German Aerospace Center, DLR, here in Germany we're actually building a remote controlled amphibious vehicle for emergency zones. So it's a vehicle that can go off-road, can swim, and you can remote control it. Now this is in the advanced development stages, but like these are the types of imagine if nothing else is possible, what's the last resort transport option that you might want to take. And unfortunately like there, there are cases when you cannot reach people which sometimes can have dire consequences.

Richard: That puts [00:18:00] last mile delivery into a completely different perspective.

Sin: Absolutely. Yeah.

Bernhard: Yeah. And look, we've also tested unmanned essentially drone delivery for food.

Now again, this is where it is interesting. We've had different unmanned automated aerial vehicles essentially like transporting food for us. Now, the challenge there is of course for food you typically need a higher payload. You typically when you think about a truck full of food, you either need a very large drone and some of these already exist, but so there's definitely opportunities, but also where technology can help us beyond the classic just the route optimization where you're going to last mile delivery indeed.

Richard: It's physical AI at that point, isn't it?

Bernhard: Exactly. Yeah.

Sin: The vehicle that sounds very interesting. Bernhard, a couple of minutes ago you mentioned Scout, your AI supported planning system tool. If we now talk a little bit about the Munich Innovation Accelerator, the program that you are running within the World Food Programme.

So can you share a [00:19:00] little bit more about this program and how do you decide what to test, what other projects you gonna sunset, and what you want to scale and how do you compare your innovation accelerator program with other let's say commercial accelerator programs that other organizations or companies are running? So where's a big difference here?

Bernhard: So I'll probably start with the last part of your question. So, how do we compare, where do we get our inspiration from? Together with a friend created like a startup called "Share the Meal" at the time, which is now World Food Programme's fundraising app. And like going through experience I got the opportunity to then actually build up the World Food Programme's innovation accelerator thinking about there must be better ways, like using technology, innovation, AI, new ventures for something like global problem, like fighting hunger.

And so essentially like the same way you think about a Y-Combinator [00:20:00] or like any commercial accelerator program, and it works in Silicon Valley, it works in Germany and Europe, it works in lots of other countries where you have an innovation ecosystem, you have essentially like startups new ideas, new innovations that really can be these game changers on why don't we use the same type of thinking for the humanitarian world? And that was the starting point of what we're doing. And then so typically what we do as a World Food Programme Global Accelerator is like, so we're looking for innovations globally. So everybody can actually apply, so it's innovation.wfp.org.

Now people need to have a company already or like a legal entity. And we typically look for solutions for problems that we see from the ground up, so from specific countries, and essentially substantiate with our business units, right? So let's say we get problems from five different countries that say this could really be a game changer.

And then we say, "Okay, there's a theme here," like in [00:21:00] talking to like our business areas saying, "Okay, which are the areas that really will make a difference if we find new solutions there," right? And then based on that, essentially we do this call for applications then run a one-week training

program, we call Innovation Bootcamp. Now this innovation bootcamp is we we collaborate with different private companies, also individuals that help us with that. It's like the typical, like essentially, like refining your, understanding your problem, refining the solution, marketing, technology coaching, and then a kind of a rapid learning plan and then a pitch event separately.

And then in our acceleration phase, we typically provide grant funding, so equity-free funding up to $100,000, hands-on support through my team and partners, and connections to our field offices. So, out of 1,000 applications inbound, we typically select the 10 best globally. And then really this is a question for us also everything we do should be having the potential to scale.

So, before any of those [00:22:00] innovations or startups come ever into our program we essentially check do they have the potential to scale? Do they solve a real problem? And then, of course, not every single innovation is has the same success, but we're trying.

And I think this is also one of the success factors for us, is like we're trying to be specifically grounded in the realities of the people that work locally with hungry people, with the communities, with the governments, with the companies and like the priorities of our headquarters businesses.

Richard: Bernhard, I'm sure that anyone who's listened to this discussion wants to help, because you can't fail to be drawn to this topic. And I am sure that you deal with many public companies that you partner with or want to partner with you and also donate time, money, support. So, how does a good partnership model actually work with the World Food Programme and how do you [00:23:00] measure success?

Bernhard: We are always open for business, as I would say. You can go to our website: innovation.wfp.org, and essentially you can contact us, reach out, like either if you personally want to volunteer your time or you wanna donate or, also maybe as a company, like you can also reach out to me on LinkedIn or like other platforms. That's totally fine, right?

I think for us, like our accelerator, same as all of World Food Programme, we are 100% voluntarily funded, which means like we actually need donations to operate. Anybody who wants to donate, anybody or companies that want to, or foundation that want to donate, like that is of course very welcome, but we also need capacity.

Like we have, companies that donate their people's time, AI engineers, product managers, marketing managers. So these are the type of skillsets we need to actually build and help those solutions to actually go to scale and scale even better. And we are, of course, also interested in any, investors like or companies that have built solutions that say, "Hey, we've already invested the [00:24:00] money here. Is this something could be relevant for you?"

And so it can go in both ways, right? And I'm a true believer into there's network effects where if somebody else has already invested money to make a tool or a company successful, maybe that could also work for us.

Richard: We're coming to the end. I could talk to you for hours 'cause I've still ... i'd love to have another chance to get you on the podcast 'cause I'm sure there's many more things that we could talk about.

But we do ask one last question to all of our guests, and I think that your answer here will be very interesting because as I said a little earlier, the humanitarian supply chain is leading the way in many cases of how other companies could or should run their business, especially in disruptive times.

So, we're really looking for a summary of our conversation and a crystal ball projection of what is the future of supply chain from your perspective?

Bernhard: So, I [00:25:00] have this vision that for World Food Programme we have an AI-enabled end-to-end supply chain, fully digitized, that allows us at any point not only to be the most efficient and effective supply chain but also to prove it and give people that we serve essentially choice.

So, at the same time as you're saying we gotta have better supply chains, we gotta have better service for the people that are receiving assistance. And I think that's the future specifically when it comes towards, like, how can we use new technologies, AI and so on.

There's also an element of getting people more voice and as a contribution in terms of what they're actually receiving. And and I think that's part of what is going to be a future vision for the people. At the same time, for anybody who funds us, whether this is governments, individuals, or corporates this is also gives them reassurance to say we can prove to you it's not knowing, it's not trusting, it's proof that, the money that you're [00:26:00] donating is as efficient as it's possible, it's ending up with the people that it's intended for.

Richard: Thank you. Bernhard this we've done this podcast for three years. We're heading towards out of 200 episodes, well over 150 at least, this has probably been one of the most inspirational and and thought-provoking ones that we've done. So thank you very much. It's been great to talk to you.

Bernhard: Thanks so much, Richard. Thank you, Sin. Really great pleasure to be here with you.

Richard: We will be sure to include all of the different links that you mentioned, whether it's the hunger map, the innovation page where people can contribute and provide their time or money in the show notes. But thanks everyone for listening. Thanks for being part of a great discussion, Bernhard. And until next time, from Bernhard, Sin, and I, thanks for discussing the Future of Supply Chain.