Zebra Your Edge Podcast

Host:
- **Mark Butler, Global Partner Manager, Zebra**

Guests:
- **Ansgar Thiede, Vice President, Data Science, Körber Supply Chain Software**
- **Justin Velthoen, Product Director, Warehouse Management Systems, Körber Supply Chain Software.**

Transcript for "AI in the Warehouse" Episode

00:00:00:00 - 00:00:21:28
Mark
Hi, welcome back to the Your Edge podcast. I'm Mark Butler, a global partner manager here at Zebra, and I have two guests with me here today from Körber Supply Chain Software. Körber Supply Chain Software is a member of Zebra's global partner portfolio. The first is Ansgar Thiede, who is the Vice President of Data Science for Körber Supply Chain Software.

00:00:22:00 - 00:00:44:24
Mark
And also have with us Justin Velthoen, who is a Product Director of Warehouse Management Systems at Körber Supply Chain Software. Both have been heavily focused on AI in the warehouse and the broader supply chain, and they have a lot of great insights to share about what's developing here. I do want to thank you both for joining me. I have a feeling this is going to be a discussion that a lot of people are going to tune into just because AI is so hot.

00:00:44:27 - 00:00:58:01
Mark
Some people say it's going to be as transformative as the internet was to business and others compare it to mobility. Either way, this isn't a matter of if one day you'll use AI within your business, it's when and how.

00:00:58:03 - 00:01:23:22
Ansgar
Hi, Mark. Yeah, thanks for having us. And I agree, this is an area which has a lot of potential. So utilizing AI methods in the supply chain area can definitely change on how we are doing things today and how things are done. And it might even be, depending on how you define AI and what kind of tools are using, it might be that's already in use in some of your supply chains.

00:01:23:24 - 00:01:40:12
Ansgar
So AI is...it is very hyped at the moment, again, through the gen AI stuff, and we might talk about that one later. But actually there are AI methods in the market available already for quite some time in different areas and we can dive into some of these details later on.

00:01:40:15 - 00:01:56:10
Justin
I'm very excited to see some of these transformations happening that make these better data tools available to the small and medium sized business market, which might normally be in the enterprise market and out of reach for some of the smaller companies.

00:01:56:13 - 00:02:16:15
Mark
Brilliant, brilliant. Thank you to you both. To get started, you know, we're hearing more and more people say that AI could do a lot to help warehousing and supply chain teams, but I'm not sure we're hearing enough about what specifically AI can do and what operations managers, engineers, IT teams and others will need to do to take advantage of those benefits AI promises.

00:02:18:01 - 00:02:29:04
Mark
Plus, AI is such a broad term. There are so many different flavors of AI. So I think it's important that we talk about all of it.

00:02:29:06 - 00:02:56:05
Ansgar
Yeah, I mean, you are right. AI is a pretty broad term, and it is used for many things today. From my perspective, there are two key areas that can be very interesting for supply chain management, where you can use AI methods. One of them is forecasting, definitely, and the other one that's technically probably not really an AI method but it sometimes is used in that context as well is about optimization.

00:02:56:07 - 00:03:24:29
Ansgar
And supply chains are all about optimization, be it a replenishment question, be it a slot in question. And some of the new AI techniques might even help in that area. But I think these two - forecasting and optimization as broad as it sounds - are definitely two areas where you can apply AI. There are probably - well there are - many more, but these two stick out, at least to me.

00:03:25:01 - 00:03:58:28
Justin
And from a box jockey perspective, like somebody who is moving boxes around in the warehouse floor, one of the things that we would hit on is there's always somebody in the warehouse or somebody in operations who's that kind of key person. And if they go on vacation, everybody gets really nervous when they're on vacation. And to be able to have tools that help facilitate, you know, movement throughout the warehouse and decision making and making sure that things are moving in the right way, even when those key people are out, that gives them the freedom to take vacations.

00:03:58:28 - 00:04:10:04
Justin
One of the things I usually bring up is it prevents injury in some cases and things like that. So it augments the warehouse in a really great way.

00:04:10:06 - 00:04:21:21
Mark
Interesting. Both points are interesting. Let's start with the 30,000 foot level. You know, from your perspective, you what type of AI is currently proving the most helpful in warehousing in supply chain environments, and why?

00:04:21:23 - 00:04:52:11
Ansgar
So, maybe I start again. So I think there are aspects of AI that are utilized, for example, for image recognition in robotics where it might be already in use. So if you already have some automation in your warehouse and you're using some robots, it's pretty likely that they're using some AI techniques to make sure that there are no collisions and stuff like that happening.

00:04:52:13 - 00:05:19:28
Ansgar
One other aspect on a famous application of AI is machine learning forecasting. So you use machine learning models, be it the simpler ones like random forests or more complex, generalized models that you can use, and you can use these for categorization of your data. You can use them for forecasting in other areas. And it's very likely that maybe in some of your tools this is already applied.

00:05:20:00 - 00:05:32:08
Ansgar
And I think these are really key aspects of AI, if start from the 30,000 foot level, where you might be already using AI actually.

00:05:32:10 - 00:06:08:06
Justin
And then I'm always looking at kind of the execution layer of what is it, you know, the person boots on the ground as they move through the warehouse, where are the pieces where we can offer value to them to make their lives a little bit easier because the labor is often one of the largest expenses that we have in the warehouse that people doing the work and being able to do the work efficiently, making sure that we keep the inventory that we've invested in as a warehouse, those types of activities, if we can find ways to help increase those numbers, we move the bottom line for a business.

00:06:08:08 - 00:06:29:07
Mark
It's actually readily apparent that your guys' skill sets are very complementary to each other, especially for this type of a podcast. But in general, a big part of what Körber focuses on day in and day out. You know, there was data in the U.S.

recently that revealed a very wide gap in the number of companies talking about AI and those actually using AI.

00:06:29:10 - 00:06:59:05
Mark
This data has fueled discussion about why we're not seeing higher adoption rates as of yet. But in Zebra studies, as well as conversations with customers, it seems like there is a fear of the unknown, maybe combined with perceived complexity. You know, people feel AI could be helpful, but they don't think they have all the skills or know how to actually get the AI tools online, or they aren't quite sure how to create this intelligence loop between AI and humans to ensure that the data that the AI generates and analyzes can become actionable.

00:06:59:08 - 00:07:10:04
Mark
I guess here's my question: How do we make AI feel manageable, especially to people who may just be just now digitizing their data and digitalizing their workflows?

00:07:10:06 - 00:07:43:15
Ansgar
Yeah, in my experience, it is a step by step process. So do not throw AI at everything. Really focus on specific use cases where you might change the bottom line, as Justin said earlier. So really focus on use cases that bring additional business value and accept that applying an AI method might change how you do things. So you're not just doing the same thing, just applying AI, but you might do the things differently.

00:07:43:17 - 00:08:04:03
Ansgar
So one aspect could be that by leveraging AI, maybe some of the micro decisions are made by the algorithm itself. But how to steer that algorithm and what the strategy around it is, that's now a different question, and that will still need a human to interact with the algorithm and to steer it and to guardrail it to a certain extent.

00:08:04:05 - 00:08:19:18
Ansgar
So the way you do your daily work might change and you have to embrace that change. So in my experience, change management is a really important aspect and introducing such a game changer as a new method to solve something differently.

00:08:19:21 - 00:08:20:15
Mark
I like that.

00:08:20:18 - 00:08:44:03
Justin
Justin I think the other thing too is each warehouse, each company is definitely, but even each warehouse might have different what I would call bleeding neck problems, like a real concern for that particular space, and to look at where they're having the largest problems and then maybe start taking some of those things down one at a time as they start adopting.

00:08:44:03 - 00:09:20:01
Justin
Because, yeah, it would be a big project to bring it across all of the portfolio. But to identify if it's a lot of inventory that's aging, then it might be more in the planning stage. If you're spending a lot on labor, might be looking to gain more efficiencies out of that and make sure that the job is easier. If it's, I brought up injuries as well, if people are going out on FMLA due to injury because of the way the box was slotted, that would be a really good one if you can attack that.

00:09:20:04 - 00:09:23:09
Justin
It just depends by the company.

00:09:23:12 - 00:09:49:24
Mark
I think we'll talk about SlottingIQ in just a little bit, too. But, you know, I know Körber talks about AI in the context of data science. So does that mean that you feel a team of data scientists are needed to effectively train and utilize the models in a different supply chain or in different supply chain models? Or is there a kind of a low code slash, no code approach that would easily fit into a low tech systems environment in a warehouse?

00:09:49:26 - 00:10:10:01
Ansgar
So there are great platforms to leverage AI methods quite easily by now. So you could look at Microsoft or at Google or other vendors, of course, that have great platforms to employ these methods. If you want to solve an existing problem differently or want to solve a new problem, then you have to deal with the data as well.

00:10:10:05 - 00:10:32:11
Ansgar
And that's where it makes sense to not just apply a method which works out of the box, but see how does it translate if I use the following data? Is the data quality good enough? Can I generalize from one customer data set to a second customer set to a third customer data set so that I don't have to reinvent the model every time I want to apply the method to a new customer.

00:10:32:14 - 00:11:03:12
Ansgar
And that's where it makes sense to think about building out the data science team to really build out a solution for customers that can ultimately scale. But obviously the target needs to be that our customers not necessarily need a data science team to utilize that solution. So it's our job to make the solution as easy to digest and to really utilize in the daily business so that maybe in the beginning you need some guidance and enablement, that you need the change management that we talked about a bit earlier,

00:11:03:14 - 00:11:21:25
Ansgar
But you don't need specific data scientists to control our job and if the solution is doing the right stuff. So it needs some investment in the beginning, but the idea is that you can build out solutions that can be utilized by non-data scientists in the future.

00:11:21:28 - 00:11:36:23
Mark
If now's a good time, maybe it would be good if you give some specific examples of how AI can be used to improve day to day decision making in a warehouse, you know, and what it really takes to get these types of AI tools online and generating that intelligence and guidance.

00:11:36:25 - 00:12:07:18
Ansgar
Yeah. So we started to focus on two key areas where we think that AI methods can help in the warehouse and one of them is around slotting. So, where to put which inventory in the warehouse? And that's essentially an optimization problem, but with new methods you can solve it differently. You can take into account all the different rule sets that might be relevant and that might be very different from customer to customer.

00:12:07:20 - 00:12:36:18
Ansgar
So that's something where data science and data-driven solutions can really help with making better decisions in the warehouse. Another aspect that we start to look at is something that you mentioned earlier, where we have a challenge in the warehouse and that's labor availability. So can we help our customers by predicting labor demand and then ultimately also helping them with solving and how to distribute the labor and plan that out.

00:12:36:18 - 00:13:07:27
Ansgar
And that's something where, while on the slotting side we have a proposed solution and that going to market with that, on a workforce planning side, we are still evaluating how much benefit our customers could get from applying such a solution. And it's very interesting to see how the predictive methods with the data that you gather in the warehouse can be brought together to generate these insights that hopefully help our customers to do a better job in labor planning.

00:13:07:29 - 00:13:32:01
Mark
It's funny you mention labor playing because that was actually a topic of conversation in one of our meetings last week where we were talking about AI and so forth that we had with some of the executives. So, let's talk about generative AI specifically for the moment. It's in the news quite a bit. Given that this type of AI is the one that everyone seems to be they feel familiar with, you know, we're starting to see some interesting generative AI use cases emerge in retail.

00:13:32:03 - 00:13:55:18
Mark
In fact, here in Zebra, Stuart Hubbard, who's our Senior Director of Artificial Intelligence and Advanced Development, was telling one of our retail leaders, Mark Thompson, about some cool new AI applications that our CTO is working on with partners and retailers. They were talking about how smart carts and the guided shopper experience and associate assistants, for example.

00:13:55:21 - 00:14:10:04
Mark
But I think where I want to understand is where it might make sense to leverage generative AI models, you know, the large language models, further upstream throughout the supply chain, whether it's a warehouse or distribution center or maybe

even over the road or in a factory.

00:14:10:06 - 00:14:32:16
Ansgar
Yeah, gen AI is a really huge topic and there are really great opportunities ahead of us. And I think we are just scratching the surface at the moment. What I've been seeing and what we've started to evaluate are two aspects where gen AI could help in the supply chain area, and that's probably just a small area that we are looking at.

00:14:32:17 - 00:15:04:27
Ansgar
One of them is tied to value. So usually implementing new supply chain solutions takes a lot of time. It takes time to understand the data or to do the integration properly, to set up custom workflows, etc. And I think they are gen AI methods similar to how there can be helping in coding itself or in generating documentation. I think gen AI methods might be helpful in actually reducing the time to value and being quicker and rolling out new solutions.

00:15:05:00 - 00:15:36:00
Ansgar
So that's one aspect that we are investigating. If we can help our customers or partners to be quicker in terms of integration times. The other aspect where gen AI is bringing something completely new to the table is how the interaction with the humans work. So it becomes so natural, this whole ChatGPT or OpenAI or all the other tools that are available now, it comes very natural in how to use that.

00:15:36:02 - 00:15:54:22
Ansgar
And maybe that's also an opportunity in the supply chain or warehouse management space. So people are very versed on how to adopt and use solutions. So there is a table, and they have to fill a certain cell, then they have to do this and then they have to do that. And maybe there's another way to get to the same goal, but in a very different way on how to do that.

00:15:54:22 - 00:16:22:20
Ansgar
So really changing the user experience or solutions, and I think that's where the gen AI solutions have been showing great success over the past 12 months and revolutionizing the user experience of the internet, of finding knowledge...of Q&As. And maybe there's similar potential in supply chain and the supply chain area of revolutionizing the user experience of the interaction with your solution.

00:16:22:20 - 00:16:50:23
Ansgar
So I think these are really two very interesting areas. One aspect that I want to mention around gen AI is where it might not be the top solution. It's about the creativity. So many, many examples of gen AI are also about these algorithms seem to be creative. They create new stuff. They sometimes are even inventing things. And I think that's what you do not want to have in the supply chain process.

00:16:50:23 - 00:17:06:28
Ansgar
You want to have absolute certainty, if possible, you want to be deterministic, etc. So I think that it is important if you start applying gen AI methods to put the right guardrails into place and be aware of the risks that might come with these techniques as well.

00:17:07:00 - 00:17:37:18
Justin
And for some of these things, we have mountains of documentation that, you know, there's a lot of knowledge that we've created that that we can expose to people. But there's time, when you have a question, to go find the answer to it. But with some of these tools, they can use more natural language to get the question that the person's actually trying to get answered to and then let the generative AI go into the dataset to pull out the answer.

00:17:37:18 - 00:17:52:10
Justin
And a person, a user, could potentially rather than, you know, submitting a ticket, waiting X amount of hours based on the severity of it to get a response, they can have an answer while they're doing their work without interfering the work stream.

00:17:52:13 - 00:18:14:21
Mark
Yeah. Good. That's well said and, Ansgar, as you were talking, in my mind, I was thinking of the word "guardrails." And sure enough, there you said it like the next sentence later. So moving on...how easy would it be, do you think, for shift workers in warehousing and supply chain environments to learn some of these applications, such as the one for slotting?

00:18:14:23 - 00:18:29:00

Mark

We know there's a high labor churn rate in certain roles and the goal is to decrease the time it takes to get new hires to full productivity. They're tied to value, as you're saying earlier, in a way. How would AI potentially help or even maybe hinder that?

00:18:29:03 - 00:18:53:07
Ansgar

Yeah, I think it's important for us, if we want to develop new solutions that are utilizing AI, that we still know our users very well. And sometimes it might be a few managers in the back room and then it's about changing their perspective of how they have been using a specific solution earlier. But in the future there might be also solutions that actually affect many hundreds of people in the warehouse.

00:18:53:07 - 00:19:22:14
Ansgar

And then it's even more important to design the solutions in a way that they're easy to digest and not complex. And yes, there is a certain air of complexity around AI methods. And for example, if you think about forecasting, one of the drawbacks that is sometimes mentioned in that context is that explainability, because it is not as easy to understand where a specific forecast might be coming from because the AI methods are leveraging so much more data.

00:19:22:17 - 00:19:47:04
Ansgar

And that's obviously something that you need to avoid if you want many users seamlessly integrated with your new solution. So you have to make sure that your designs are properly thought of and enabled and your users properly so. That's that's something that needs to be very top of mind because otherwise the complexity that comes with such a solution could be overwhelming from time to time.

00:19:47:04 - 00:19:53:26
Ansgar

That's a very fair comment and it will be important to to deal with that.

00:19:53:29 - 00:20:16:16
Justin

In the terms of a slotting tool, just as an example of a workflow, what we would be doing is taking a process that's probably very data centric, very complex, and takes a significant amount of time to analyze a lot of information to turn it into actionable movements within the warehouse. So I need to swap these two items. I need to swap these two.

00:20:16:19 - 00:20:40:27
Justin

So in a beginning scenario, somebody would probably be doing a lot of computation on it. It could be Excel sheets, you might even have macros around it, but there'd be a time involved. And instead, in the future state, you would have a tool that would be looking at that data and will have learned how to make a recommendation and then send that back to the users basically a work stream flow.

00:20:40:29 - 00:21:10:10
Justin

So it would have ranked and prioritized each of the movements so that each one would happen consecutively. Now, to your point, to the guardrails, you might have rather than a person who is just significantly more knowledgeable at the warehouse and know what was happening in the company and be able to identify things and make switches, we can start looking at the people who are executing the movements and get a feedback loop from them and say, "You know, this move just doesn't make sense."

00:21:10:10 - 00:21:37:04
Justin

It's a broom handle, which is a weird thing to try to slot. It needs to go here and then we can take a look at the data and the rule that applied to it and say, "This is how we need to change it." So we've gone from, you know, maybe weekly or daily having, you know, a complex data review piece and turn it into a data update piece or rule update piece as needed as well.

00:21:37:04 - 00:21:57:05
Mark

You're talking about sort of decision making, which actually leads me to the next question. So when people talk about automated decision-making in supply chain, how much of that is truly automated? Meaning there are some instances when the machine is literally doing all the work, making a recommendation, and then triggering an action on their recommendation without a person even first reviewing approving the action.

00:21:57:11 - 00:22:09:13
Mark

Kind of what you were speaking to a second ago in a way. If so, you know, when does that type of what I call "full

automation" considered low risk?

00:22:09:15 - 00:22:36:27
Ansgar
So. Well, what I think you can differentiate sometimes is the macro and micro decisions. So, and usually in supply chain processes, you have to do both. And when I'm talking about micro decisions, it's: you have thousands of goods in your warehouse and you need to decide if you do a replenishment and how to fulfill an order, where to push the latest receipts, etc..

00:22:36:27 - 00:23:06:09
Ansgar
So there are hundreds of thousands or sometimes even millions of micro decisions that need to be made on a day to day basis. Some of them might be already highly automated because you have a very robust ruleset of how things are happening that maybe some of them you don't revise the decisions, you don't make a decision. And I think that's an area where AI methods can help with really automating the decision making and really the output is a decision and you just execute.

00:23:06:11 - 00:23:26:15
Ansgar
If you think about the macro decisions, then you probably don't want to have that automated from an AI perspective. You want to have a guidance, you want to have better insights. You might combine insights from an AI tooling and from more classical BI tooling and then be guided in how to deal with that. Where should I put my next warehouse?

00:23:26:21 - 00:24:04:21
Ansgar
That's such a big decision. You don't want to hand that out to an AI and then just start building it out. You probably get some guidance, you get some cost calculations, you maybe run some optimization, and then you still make the decision yourself. So that's where I would differentiate from a collaborative approach. So we're humans and AI need to work hand-in-hand and the strategy needs to be set, etc. and where you really have an opportunity of leveraging AI methods in a way that's really fully automated and it's much quicker and much better decision making than not leveraging an AI method then in the future.

00:24:04:23 - 00:24:25:14
Justin
Yeah, and I tend to do this in my own world separated into two separate pieces. So I might use AI or other tools to help me define a business case to see where the opportunity lies, to see how to frame it, how to position it, and then to take that to a board and say, these are our options...

00:24:25:14 - 00:24:40:25
Justin
this is the situation that's come up to then get their approval to build a business plan in much higher detail in fidelity. So I might use a tool to go along with that to help build the detail in fidelity. But to have stage gates across the path.

00:24:40:27 - 00:24:56:13
Mark
Okay. All right. Well, let's let's talk about potential risk. You know, I'd imagine that there's probably some risk monitors and oversight procedures in place that these is this where AI is working a little bit more autonomously? Correct?

00:24:56:15 - 00:25:26:06
Ansgar
Yeah. So similar to other methods, you would put some guardrails, you might put some monitoring around it to make sure that it doesn't go out of out of whack. And I mentioned earlier the example of explainability in the area of forecasting. So are some times that is just tough to comprehend where specific decisions are coming from and then it can be helpful to put additional monitoring in place to just give guidance on what data was utilized.

00:25:26:08 - 00:25:53:23
Ansgar
And then sometimes it is straightforward. You see, okay, there was a there was a gap in the data that explains why even the AI method didn't come up with a reasonable solution to the challenge. So, yes, monitoring makes sense and guardrails make a lot of sense so that even if you allow an AI method to decide if you're going up or down, you put certain guardrails on how up and how down you might go ultimately from your decision making.

00:25:53:25 - 00:26:23:19
Justin
Okay. Then we often see tools like that within the warehouse as well. So if I'm a inventory control person and I'm going to adjust out inventory, I'll probably have multiple reasons, maybe scrap, damage, utilization. So various different points and each of those might have different criteria against it. Based on my position in the company, I might be, you know, authorized to just approve anything that's under $100 just go straight through.

00:26:24:16 - 00:26:39:26
Justin
Anything under $1,000 might need a supervisor approval or a secondary review, and then anything over $10,000 might need corporate sponsorship or something like that. And that's pretty common in most of the workflows we have in the warehouse today.

00:26:39:29 - 00:27:03:26
Mark
Thank you. You know, the next one we're going to move on to, we kind of teased a few minutes ago, but let's talk more about the use of AI for slotting. As I know, this is an area where Körber has been investigating opportunities for improvement. What role do you see AI playing in slotting decisions and actions? How does it either simplify or speed up the process or help organizations improve the slotting logic?

00:27:03:29 - 00:27:40:08
Ansgar
Yeah, thanks for bringing that up. Our slotting solution is really meant to drive efficiency in the warehouse, so that's what the idea is behind the algorithms that we're using there. I mentioned earlier, ultimately slotting is an optimization problem and algorithms that we are using there are playing into that, are playing in that field. And what we were ultimately able to do is really come up with a solution that drives efficiency in the warehouse and looking at customers that we've been investigating by 10, 15, sometimes even 20%.

00:27:40:08 - 00:28:06:01
Ansgar
So really reducing the distance that needs to be covered in the picking process and by having the inventory placed in a better area, obviously it's not just about the optimization in itself and to distance itself, but it is also important to be aware of all the rules that are required around two different types of inventories, around the different types of locations.

00:28:06:03 - 00:28:40:19
Ansgar
So the algorithm needs to need to drive flow for efficiency optimization, but it also needs to take into account all the rules that are so relevant for your warehouse setup in terms of safety, in terms of weights and guidelines that come with your inventory and combining that and coming up with the solution that helps our customers to drive to warehouse efficiency was really key for us in that journey.

00:28:40:21 - 00:29:10:23
Justin
And anything anymore. Most of the conversations I have are about labor and trying to make sure that we're utilizing our labor to the best extent and where we're saving where we can. And slotting is one of those first places where we can really start optimizing how we use our people within the warehouse. And I have a I'm fortunate that I had a background that I actually was a slotting person for a pretty decent sized warehouse down here in Southern California.

00:29:10:25 - 00:29:32:29
Justin
And one of the issues that I had was I came in as more of an IT person fresh with my IT degree. So I was building reports. I was writing rules to make recommendations to me, but without necessarily knowing the product. And I was leveraging some of the people in there that knew the products better to help to find those roles to start.

00:29:33:02 - 00:29:59:28
Justin
And every time I made the recommendations, I would then need to kind of work to get that move done within the warehouse because it was considered an indirect time. So that was time that wasn't exactly adding to the net value of an invoice, it wasn't necessarily billable. So it was a lot of work I had to do on the front end to then try to convince somebody to do, and I'd have to take a look at the product to to see how that went.

00:29:59:28 - 00:30:22:26
Justin
So as for my role, I like to think I was adding value to the company, but it was a lot of labor on my part to convince a lot of labor in the warehouse to do a bunch of things and to manage that work. And if we have tools in there that can automate some of that decision making process, if we have tools in there that can be looking for specific things.

00:30:23:03 - 00:30:42:26
Justin
One of my biggest, I guess said was around injury. I wanted to make sure that anything that was heavy was in a place that would be efficient to pick up and was not going to injure the person who is doing it. One is because we want to make sure that we have our people and we keep them safe and working through it.

00:30:42:28 - 00:31:05:25
Justin

But mainly because these were my friends, these are people that I saw every day and I wanted to make sure that I was taking care of my friends in the warehouse. So by taking and using better tools to design and architect how these moves go through, I would be free to focus on some of the larger things like warehouse expansions and things like that.

00:31:05:25 - 00:31:21:16
Justin

And use my skill sets toward a larger opportunity. And this work can be sitting there for my team when they got started and they can take them down in a ranked order of importance and value creation.

00:31:21:18 - 00:31:48:09
Mark

You mentioned product location rules and so forth. That actually dovetails right in the next question, thinking about how the AI model works. You know, it's combining user defined product location rules, historical and forecast order volumes with mathematical optimization techniques to really to help warehouse operators determine the best location of slot inventory. You can simulate the picking process to evaluate the impact of that recommended location.

00:31:48:09 - 00:32:18:11
Mark

You know, to me, it sounds like humans would very much need to be in the loop here and to both set some rules confirm that it's AI's recommendation that does indeed work well for the people who also may be acting upon the recommendation. Yeah, so I imagine this particular AI application would be extremely helpful for operators trying to figure out where to either put fast moving inventory or even seasonal inventory that maybe has high throughput or limited time, then eventually may need to be replaced with new SKUs.

00:32:18:14 - 00:32:28:05
Mark

So a little bit different than what you were talking about, Justin, where you didn't want your warehouse workers, your friends, to be hurt. But you know, what about like seasonality and so forth or fast moving SKUs.

00:32:28:07 - 00:32:55:26
Justin

And that was actually one of the pieces that this offers that I wouldn't be able to, especially when I first started. Obviously, I wouldn't have a key vision into what each particular SKU did over the course of time. We supplied to a number of different customers who had very different seasonality. I mean, there was some continuous seasonality that managed across the board, but some things were moving up and some things were moving down.

00:32:55:28 - 00:33:25:15
Justin

So a tool that could look at that and look at historical data would be immensely valuable to get somebody started right away into becoming effective. And then one thing that I was building into my toolsets using velocity, but what I couldn't do is look for hotspots of how people were gathered and try to distribute that a little bit better because it's one problem to move things into velocity order, another one to look at it -

00:33:25:15 - 00:33:43:24
Justin

nd it might be high velocity - but due to the format of the box you get a lot of congestion. And a tool like what Ansgar is talking about can take that information in and spread those as a second layer of complexity and data.

00:33:43:26 - 00:34:10:05
Ansgar

Yeah, and another aspect that we want to invest into from a slotting perspective is not just looking at the warehouse efficiency, but also looking at secondary KPIs that, for example, congestion or also replenishment needs. So for many warehouse operators, it's not just about having an efficient picking process but also being aware of how much replenishment runs do I have to do on a daily or weekly basis.

00:34:10:07 - 00:34:36:26
Ansgar

So can we include some of these aspects as secondary KPIs in the optimization and allow a more strategic setup of the slotting itself? So these are things that we are exploring with our customers and what we want to improve the solution and step by step and time over time to really cater for - for not just efficiency but also all the other aspects that might be relevant from a slotting perspective.

00:34:36:29 - 00:34:57:13
Mark

Brilliant. How easy would it be to take this logic and, say, apply it to picking if you're sending a warehouse associate a batch

of orders to pick, could the same type of AI be used to analyze the items in that batch and then maybe suggest the best route through the aisles so they're moving efficiently and not having to backtrack or jump all over the place?

00:34:57:15 - 00:35:05:08
Mark
Perhaps even syncing with voice technology systems to get the most efficient navigation guidance to that picker?

00:35:05:10 - 00:35:25:26
Ansgar
So there is some overlap to route planning, obviously, but ultimately it's a slightly different challenge that you would have to solve. You can probably leverage a lot of the same data to solve the route optimization problem. But what we've seen when talking to our customers is that it also depends on what do you pack on a route actually.

00:35:25:26 - 00:35:45:17
Ansgar
So it's a multi-level problem that you have to solve. If you think about the route optimization, it's not just you have all the items on your list and now what does your route look like? It's also which items do you put there. So you actually have a problem that you can solve from multiple angles.

00:35:45:20 - 00:36:00:10
Ansgar
So while the data is probably very similar and some of the optimization techniques might be the same, you would still need a different method ultimately to solve the route optimization challenge.

00:36:00:12 - 00:36:44:08
Justin
And even to earlier stream of as you're creating the work, deciding which is the area that would be best suited to deliver that piece. So you know, we have a lot of things currently where you might take a certain piece and based on the level of complexity, it's a full pallet, it's a full layer, it's a case, it's a breakdown of an each...using things like that to define where we send that unit of work for which robot, person, voice, where to send that to make it, get to the end result the most efficiently based on all the other work that's going on in the warehouse.

00:36:44:11 - 00:37:01:17
Mark
You know, this time has been fantastic. I think that we have gone longer than we probably expected, but that's okay. This is good stuff. But before I let you both go, let's talk a minute about data quality, because I know this is something that might be looming in on listeners minds if they haven't digitized all the data yet.

00:37:01:24 - 00:37:19:28
Mark
And some things are still analog or perhaps there's a ton of disjointed systems that connect your data within their systems. How much will that impact their ability to derive benefits from an AI software application such as Slotting IQ or an AI powered workforce management tool?

00:37:20:00 - 00:37:51:22
Ansgar
That is indeed a challenge. So, I mean, it's only as good as the data that they're leveraging. That's true for AI, that's true for optimization, and that's true for more classical machine learning forecasting models. So being aware of what data quality you're utilizing is key. So it doesn't always need to be top quality, but you have to be aware of where there might be gaps in the in your data quality so that you can treat it appropriately in the beginning.

00:37:51:24 - 00:38:16:02
Ansgar
So you have to you might have to make your algorithms more robust against data quality, for example. And ultimately the lower the data quality, the lower also the outcomes that you can expect. So that's just a given AI methods, but it doesn't mean that if you don't have high quality data, they cannot be used.

00:38:16:02 - 00:38:20:25
Ansgar
You just have to be aware of it and treat it differently.

00:38:20:27 - 00:38:41:07
Justin
And, you know, thinking about data, the way that I was seeing it in my experience was we probably have a new inventory item that got created by merchandizing. They ordered it and based on this fact that they had it in the catalog, they type in the dimensional data, the dims and the weights that they had from the catalog perspective.

00:38:41:07 - 00:39:04:06
Justin
But when you get it on to the warehouse floor, we would, you know, always cube it as it came in to make sure that we had our own measurements and weights and make sure that we're flagging, you know, terming guardrails, like you mentioned earlier, to make sure that we say, you know, this was a proposed dimension and weight and this is the actual dimension and weight, and make sure that we're updating that as we go.

00:39:04:08 - 00:39:26:09
Justin
But even the slot sizes and capability. So one of the first activities I did, I wasn't sure if it was hazing or not, but I was sent into the freezer to measure every single bin location in the warehouse, which was a lot of fun. So, I got a lot of intimate understanding of each location, each piece of rack in the warehouse.

00:39:26:11 - 00:40:04:13
Justin
But as people are recommended to do a move, if it doesn't fit based on the cube of the item, the cube of the pallet, and the cube of the location, that should be another one of those guardrails where we come back and say, okay, something's off. It's either the item, the pallet or the location. Let's see where that data is and rather than just hitting skip, well, let's assign that piece of work item to a person to go in and examine, to do that quality check to see where was the data off so that later on that data and the decision are going to be that much more reliable.

00:40:04:15 - 00:40:08:25
Mark
I think it might have been hazing.

00:40:08:28 - 00:40:11:29
Justin
They gave me a jacket, but it was not enough.

00:40:12:02 - 00:40:31:24
Mark
A jacket. Okay. This has been extremely insightful and I hope our listeners have found the time of the discussion valuable. I know Körber just published a white paper on AI in the supply chain. We're going to link that in the blog post that's going to be accompanying this podcast in case anyone wants to take a deeper dive into what we just discussed.

00:40:31:26 - 00:40:53:13
Mark
And we'll also put your contact information there as well so people know how to reach out to you guys with questions. I definitely want to thank you guys for sharing your expertise with us. Hope everyone is walking away with a little more confidence that AI is something that they could indeed bring into the fold of their organization maybe within the next few months, regardless of the size of the operation or the extent of their data science experience.

00:40:53:15 - 00:40:55:27
Justin
Mark, thank you for having us. Really appreciate it.

00:40:56:00 - 00:40:58:23
Ansgar
Yes. Thank you so much.

00:40:58:25 - 00:41:16:19
Mark
My pleasure. You guys are rock stars and I'd like to thank our listeners and both of you for taking part in such a great discussion on a fascinating topic. The podcast is the third in a series of podcasts that we're doing with Körber Supply Chain Software. The first was around warehouse trends. The second was around voice picking and voice operations.

00:41:16:22 - 00:41:34:26
Mark
This being the third, both will be linked with an accompanying blog for the podcast with a link below. I believe the next podcast with Körber will be on direct store delivery, but you have to stay tuned to find out for sure. So I thank you both for being here. Appreciate it.

00:41:34:28 - 00:41:36:15
Justin
Thank you. Cheers and have a great afternoon.

00:41:36:22 - 00:41:37:17

Ansgar
Thank you.

00:41:37:19 - 00:41:39:13
Mark
Cheers.

ZEBRA