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# 03 | Robotics: Laura Scott, Takeoff Technologies

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**Reid Jackson:** *Welcome to the Decoded podcast presented by GS1 US, where today's thought leaders help us crack the code on emerging technologies. Hello everyone, my name is Reid Jackson and I will be your host for today's podcast. And I'm super excited about today. We're going to be talking about robotics with Laura Scott from Takeoff Technologies, but before we get to Laura and the show, I wanted to give you just a quick little background and foundation for who we are and why we're doing this.*

**Reid Jackson:** *So I work for the corporate development/innovation team at GS1 US and we look at new technologies, artificial intelligence, block chain, computer vision, augmented reality, and lots of other things related to this digital disruption we're all dealing with and how it's impacting both our business and our customers. But I'm super excited to be talking about robotics today with Laura Scott. And Laura, welcome to the program.*

**Laura Scott:** Thank you Reid.

**Reid Jackson:** *Really appreciate you joining us today. Laura, if you could, just give us a quick background on yourself and how you became the COO of Takeoff Technologies.*

**Laura Scott:** Absolutely. So I joined Takeoff about a year ago. Before that, I worked at Wayfair for about nine years. Now, those of you who have shopped for home furnishings, home decor probably know Wayfair, so had an amazing experience at Wayfair. We went from 250 million in revenue to 6 billion in revenue by the time I left. And when I found Takeoff, Takeoff was exactly what I was looking for. Big business opportunity, a great team, really challenging problems and I've been here a year, it's been fantastic.

**Reid Jackson:** *That's awesome. Like I said, we are so excited to talk about this. I mean, you and I met back in May 2019, in Miami when I saw Takeoff Technologies for the first time. And we're going to talk about Takeoff in depth, but just to all those that are sitting there going, "Okay, so what's Takeoff Technologies?" I describe you guys as a robotics automation, micro fulfillment service for grocery, is that fair enough? Is that a good description or would you describe it differently?*

**Laura Scott:** No, that's an excellent description. Yeah. We're really unlocking, for grocery retailers, the ability to fulfill online grocery, e-commerce through their own stores. So, it's a very novel concept. It's bringing automation and robotics to an industry that has historically not been very technically advanced. And it's really disrupting the marketplace and what can be done as online grocery grows.

**Reid Jackson:** *Yeah, we're going to get into that in some great detail. But before we do let's just talk about robotics. I mean, let's just talk about it at a macro level here. When, I say robotics to people, and preparing for this show, and doing some research of my own 9 times out of 10 when I say robotics, the first thing that comes to mind to people are physical machines. They have wheels, or they have treads, it's kind of that SciFi. Sometimes they'll say, "Well, a robot could be just an arm, like doing work at a car plant, or something." But robots are a lot more than that, would you agree?*

**Laura Scott:** Absolutely. And it's funny, when I first think of robots, I think of The Jetsons. I think Star Wars, The Jetsons, R2D2. No, I mean it's crazy when you start actually digging in, you realize we're using robots everywhere: hardware, software, literally everywhere. And you can see it a little bit as just a general citizen when you sign on to a website and it asks you to confirm your identity, and make sure you're not a bot. They're talking about robots.

**Reid Jackson:** *Yes. That's a great example. I'm not a bot. I have to check this. Talk a little bit more about that because I tell folks and they're like, "Oh, I get it. The physical robots still need software. So, you guys could work with some of the software." I'm like, "Yeah, but there's software robots, like they use them all the time. That's how Google is built, off of software robots." So can you talk about that a little bit more?*

**Laura Scott:** Yeah. So I think a great example is from my Wayfair days. One of the things that we

furniture items and we basically built these software robots that would go out across the web, find the same items that we were selling on other retailers' websites and pull back the price. The problem is you can't just pull back the price on furniture because this is big bulky stuff. And so some sites might have free shipping, some might charge \$50, so there's variation in what the shipping price, the fully loaded price is going to be on a coffee table. So we would go build a robot so that the robot could go out across these sites, find this particular coffee table on 10 different sites, and then proceed through the ordering process up to the point of putting a credit card in, so that they could pull back the fully loaded price with shipping, with tax, with any other add ons.

**Reid Jackson:** *So very, very interesting. So folks, the first thing out of today's show is when you think of robots think software because software's driving the hardware and software might just be the bot. And it doesn't have to be this physical thing to do the work.*

**Reid Jackson:** *So let's shift gears here and let's talk a little bit more specific about Takeoff Technologies. What is the problem that Takeoff Technologies is solving for?*

**Laura Scott:** Well, like every other industry people, consumers are turning to online to save time, gain convenience, and basically make their lives easier. So groceries is sort of the final frontier for e-commerce, right?

**Reid Jackson:** *You said that it's the final frontier for e-commerce. I would think it was the first frontier. I've seen e-com on grocery for a while. Are you just saying that it's not working?*

**Laura Scott:** It's not penetrated, right. So think about fashion, 50%, 5, 0% of fashion is bought online. For grocery, in the United States, it's 5.5% online.

**Reid Jackson:** *That is significant difference. I didn't know those numbers.*

**Laura Scott:** And think about how big grocery is. So it's a huge, huge opportunity. And it's just in the infancy of being online. And why? Why is it hard to do online grocery? It's hard because you're talking about low value items, typically, that you need at a particular time that are highly fragile and perishable that require cold chain. You have to keep that ice cream cold and get it to the person in the right temperature, both for food safety and for customer satisfaction. And groceries in industry was very low margins, typically 2, 3% margins in grocery.

**Reid Jackson:** *Yeah, most people don't realize that.*

**Laura Scott:** Yeah, exactly. So how do you move an industry that's, essentially, been operating with a highly labor dependent model to online? And certainly in the last few years there's been just a tremendous upset. I mean, Amazon bought Whole Foods and sort of sent a shock wave through the industry. I mean that was really like planting the flag. "Yes, e-commerce is coming to grocery." So here you are, you're in a model, you've got lots of perishable product. It's bulky, it's low value. It needs to be at the customer at a certain time. And you've got cold chain to consider. You also have a industry that is not super technologically sophisticated. So when you turn to

happen?" Basically you look around and it's sort of crickets, right? Because most of these teams haven't necessarily invested in digitally native, digital experienced team members. So they basically have to look outside.

**Laura Scott:** So they need to work with partners. Some of them they go out and find maybe a front end so that they can get their catalog online, and the customer can browse, and pick their groceries, and purchase the groceries. But then when it comes to actually fulfilling the grocery order, they typically are faced with hiring more labor, or using their own labor to go pick the groceries in the store. So think about it, you're already running your store, you've got your cost model, whatever it takes to run your brick and mortar store. And now, on top of that, you're going to pay an employee to go walk around the aisles of the store, pick that customer's groceries. Oh, and then by the way, they want them delivered. So now you got to figure out how to get them to that person's home, which is either creating a fleet of trucks and doing the driving yourself, or partnering with a last mile home delivery. But, either way, all of those costs are incremental to your base cost of serving the order.

**Laura Scott:** So in some ways the grocery is in a terrible position. They know that their consumer wants to shop online, but every time a consumer moves from brick and mortar to online, they lose money.

**Reid Jackson:** *Right, they're adding costs to their overhead.*

**Laura Scott:** Exactly. So that's where the Takeoff comes in. Takeoff, has an end-to-end solution. Everything from the front end, the ability to a white label website where you can have your merchandising and shop for your groceries through to the automated fulfillment center, which we place in the retail grocer's store, takes up 10,000 square feet, I'll talk more about that. And then, all of the pieces down the line. So replenishment, forecasting, the merchandising assortment decisions, the actual fulfillment, the last mile home delivery. We work out partnerships with the retailers so they can get that piece done. And, with that model, because of the automation the cost to serve a grocery order is cut in half compared to the grocer's traditional methods.

**Reid Jackson:** *Yeah, I have to say when I first saw this back in May at your facility down there in Miami, you walked into the grocery store and it looked like a normal grocery store. And then, when you guys took me to the back it looked completely different. I saw the robots, I saw the people interacting. I was very, very impressed walking away going, "Wow, this is completely different than what others are doing."*

**Laura Scott:** Yes, yeah. And the proof is in the efficiency gain. So you think about being a shopper in a store or shopping for someone else. You're walking the aisles, you're being directed to go to different aisles and pick different products. Picking an item when you are just walking the aisles of the store, you can pick one item every 60 seconds. When you are using the Takeoff micro fulfillment center, the picker can pick one item every six seconds. So incredible gains in efficiency because all of the goods in the grocery store are basically coming to you. You

groceries, and bagging them immediately into the customer's order. So it's just a tremendous efficiency gain.

**Reid Jackson:** *So, that is very interesting. And the point I wanted to bring up, I was talking to a very good friend of mine that I hadn't seen in a long time and he's like, "Oh yeah, Whole Foods by our house, disaster." I'm like, "What are you talking about? Everybody loves Whole Foods." And he goes, "No, no, no. Ever since Amazon has taken it over, it's like full contact sports in the aisles." I'm like, "What are you talking about?" He goes, "Reid, you go there and it's all employees picking off the shelves except they're not employees." I'm like, "That doesn't make any sense," because I hadn't experienced it because we don't have one. But what he described to me was these are employees that are picking the online orders, but you can't ask them questions because they're driven by speed. Whereas, when I went to your store it felt really normal.*

**Laura Scott:** Exactly.

**Reid Jackson:** *And who are you guys partnering with on the robotic side?*

**Laura Scott:** So we are partnering with a company called KNAPP, K-N-A-P-P. They are a very established automation custom engineering company. They've got offices in 80 countries. That's one of the key reasons that we decided to partner with an automation company as opposed to designing our own intellectual property, our own robots, is that we really felt that this market is going to grow so quickly. Online grocery is going to grow. It's not going to grow at 5, 10%% it's going to grow at 20, 30, 40% year over year. And so partnering with a robotics partner who's been around, whose technology's reliable, proven, being used in multiple applications, allowed us to design a solution that can fit in almost every grocery store and be up and running. Once the site is ready for us, the 10,000 square feet, we can have it up and running in three months.

**Laura Scott:** So that's a time speed to market that is really what the retailers are needing at this moment in time because they're trying to play catch up. And imagine if we're only at 5 1/2% penetration online today, and the Whole Foods or the various retailers' aisles are getting jammed with people picking other people's groceries. What does it feel like when we're at 10%, 15% penetration?

**Reid Jackson:** *Yeah, very, very, very interesting. So I want to change gears just a little bit here slightly. So you, obviously, are going to have to create some type of database, right? To know how orders are coming in, and referencing, and those types of things. And most in the grocery, grocery is a huge industry that partners with GS1, they're great. I mean, the first, the first bar code ever used was on a package of Wrigley's Juicy Fruit at a convenience store in Ohio. And now we see self-checkout has been around for a long time, now. I mean my kids just know it, and they go and do it. And so GS1 Standards are used at that self-checkout. But there's other areas where you still run into challenges, where some folks are using G INs, global trade identification numbers, some are not, some are reusing them. So, if we had better data hygiene does that help you? Does it hurt you? Does it not make a difference?*

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**Laura Scott:** Oh man, it would be amazing. Seriously, I can give you a couple examples. We discovered this first in our first micro fulfillment center in Miami with Sedano's. Most items, pretty clear you got the item with all its attributes, it's got a UPC attached to it. That's great. We had this one brand of ice cream where this company uses two UPC codes. They use one UPC code for all of their vanilla flavors, and one UPC code for all of their chocolate based flavors. So a chocolate chip cookie dough, and a vanilla peanut butter cup, and a Heath bar crunch all have the same UPC because they're all vanilla base. And similarly on the chocolate side, which just literally threw us for the biggest loop because, now, you've got multiple unique products using the same UPC, which just sends the whole thing into a complete disarray.

**Reid Jackson:** *Right. So just to kind of turn that into layman's terms, it's like every guy that walks into the place is named Reid and every girl that walks into the place is named Laura, right?*

**Laura Scott:** Yes.

**Reid Jackson:** *And so it's like, "No, not that Laura, I need the other Laura. No, not her, that other one." And that's the way computers start to look at this. And we're seeing more and more in grocery the need to have stronger hygiene, better adoption of these global standards. Now, as I said before, GS1 is a not-for-profit organization that actually works for industry. Well listen, is there anything else that you want to talk about that you wanted to get in before we move on?*

**Laura Scott:** There's two things that I would throw out there as just additional benefits. So one, it's right in our name. So Takeoff Technologies, we sell software and hardware as a service. We build and help retailers operate these micro fulfillment centers. Micro, that means they're 10,000 square feet, they can fit in any retail grocery store. We do that for a specific reason. We do that because when you think about the last mile delivery to the customer, if you are 50 miles away from your customer base you're going to need an entirely different logistics network in order to get those groceries quickly on time to the customer, cold, food safety, et cetera. If you can have a micro fulfillment center in your local grocery store, then most people live within five, six minutes of a grocery store, right? So maybe five miles away from their grocery store. We can then perform that last mile at a fraction of the cost and significantly faster without having to have refrigerated trucks, or anything like that. So that's a big benefit.

**Reid Jackson:** *Yeah, that's very interesting. I didn't think of that. So it's instead of having the traditional warehouses, which are out in your commercial, industrial areas of your counties and towns, which typically are removed from the general population of your local grocer.*

**Laura Scott:** Exactly. The second thing, which is really quite hidden. If you've ever done online shopping, you've probably discovered that say you order 50, 60 items. When you get those items, you find that there are a few missing. Either they were out of stock and there was no substitute. Or, they substitute it with something else. Out of stock and inventory accuracy is a major, major problem in the grocery world. When you go and shop for yourself, you often don't even really realize it because you say, "Okay, well my normal butter's not there. I'll just get this butter." And you don't really think about it too hard. But when you shop online and then the

**Laura Scott:** One of the benefits of our solution is that we know exactly what we have in inventory at every moment in time inside that micro fulfillment center. So we have incredible inventory accuracy, and we do not have the level of out-of-stocks, or substitutions, or those sorts of things that the customer really doesn't like. So, that's incredible. And it also allows us to manage the inventory very well both in terms of looking at what's selling, what's not and managing merchandising, but also in terms of expiration dates. Because every item that goes into the machine we are entering an expiration date. And so you're never going to have a situation where you picked up some yogurt, you get it home, and you realize it expires tomorrow because we can manage that through the computer, we can pull that out, and take care of it beforehand. So inventory accuracy is really important.

**Reid Jackson:** *Okay. Couple of quick questions, just quick responses. Some folks wanted to know about this. What does it cost? What's the average cost to stand up a minimal footprint with your system? I mean, ballpark.*

**Laura Scott:** Yeah, so the micro fulfillment center costs, basically, about \$3 million. It services \$30 million in grocery revenue. So, \$3 million that is the cost of the hardware, support, et cetera, and services \$30 million in grocery revenues a year.

**Reid Jackson:** *It sounds like a pretty decent return to me. How long does it take to build the micro fulfillment center?*

**Laura Scott:** Once the retailer has the site ready for us ... so I didn't know this, but apparently grocery chains, they renovate 10% of their stores per year. So we work with the retailer, figure out which stores are on the renovation plan, pick the right one with the right demographics. Once they have the site ready, we can have the solution up and running in three months.

**Reid Jackson:** *That's good. So a quarter of the year and they'll be rocking and rolling. What is one of the first things a retailer needs or a grocer needs to do before deploying a robotic e-commerce fulfillment initiative?*

**Laura Scott:** We work with the retailer quite closely in the time leading up to when we're going to actually start putting the racking up, et cetera. There's a lot of business decisions to be made. The micro fulfillment center holds about 15,000 SKUs. In their store, they might have 45,000 SKUs, so there's immediately decisions that need to be made about what is the assortment that you're going to offer online? Are you only going to offer 15,000 SKUs, or are you going to offer a long tail that you go and pick from the store? There's lots of business decisions around the assortment. And then, really process mapping all of the different functions from forecasting, replenishment, invoicing, order management systems, all of those things because we need to integrate with the retailer and make sure that all of our systems are talking to each other at the right time.

**Reid Jackson:** *See, you just mentioned something that I remember seeing in Miami when I went down to check this place out, was the order replenishment. So, in a traditional distribution*

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*guys don't have it in your micro fulfillment centers, you go into the store, and go to the shelf and pull it off the shelf, and fulfill it.*

**Laura Scott:** That's right.

**Reid Jackson:** *And vice versa, right? Vice versa, if something changes, internet goes down and more people are coming in, you can still push things to the front of the store. I remember having that conversation. Okay, what is one barrier that industry has to overcome in order to see autonomous retail grow exponentially? So you talked about e-commerce with grocery being 5%. What really needs to happen for autonomous grocery to really move into that 30 to 50% like other industries that we're seeing?*

**Laura Scott:** Yeah, I think there's really going to be an evolution in grocery. And in grocery they really still think about the store, think about end caps, think about free samples, think about the experience in the store. And, obviously, I don't think stores are ever going away, but I think that the store of the future is going to look a lot different than today's grocery store. And the grocery store that, basically, we've been going to for our entire lives, right? It hasn't changed that much in the last 50 years.

**Laura Scott:** So, if you imagine that more of the kind of center of the store, the toothpaste, the Cheerios, the kind of boring stuff that you just need. If that all moves to automated fulfillment, and you place those orders online, and they're probably replenished recurringly. And then maybe the store experience becomes more inspirational, more thinking about meals coming forward. Like, what do you want to cook for dinner this weekend as opposed to what you need today to put on the table. So I don't know exactly where it's going to go, but I think there's a real evolution.

**Reid Jackson:** *Yeah, it's a really difficult time. But a couple weeks ago in Austin, we had a dinner with a lot of folks there and some of the younger folks at the table are like, "Well, retail's dead, there won't be any stores. We'll just do everything online." But then on the flip side, some people, young people, "I want to go have the experience, I want to get away." I really feel bad for retailers because you have to have a multiple presence. You need the big store, the little store, and the online store. And that is a hard balance to really go through.*

**Laura Scott:** And having them work together seamlessly which, of course, is what they call omni channel. But how many times have you gone to a retailer's site, check that they have inventory on something that you want in the local store, and then drive to the store and guess what, they don't have the inventory? I mean, these things happen all the time. So, it needs to evolve to be seamless between all the channels.

**Reid Jackson:** *Well listen, I can't thank you enough for being on the show today and talking with us. I mean, we could go on and on, and on. And, again, just wanted to thank you so much.*

**Laura Scott:** Thank you Reid. It was really fun.

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*National Users' Conference, in June, 2020 it will be in Las Vegas. And we're looking for applicants. If you go online, you'll see our startup lab, and we're giving away \$10,000 to the first prize winner. So check out our startup lab online, and please make sure to leave us a review. We'd love to get five stars, but if we don't tell us why. We're looking to improve the show. We'll have some show notes available as well with some information about GS1 and our standards to Startup Lab, and Laura and Takeoff Technologies, and other shows to come. But, again, I just want to give one last thank you to Laura Scott for joining us today. And everybody have a great afternoon. Bye now.*

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