The Impact of Blockchains for Food

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Transcript:

Rachel Greenberger: Thank you. Welcome everyone. I'm really, really excited for tonight, because I'm going to be learning right along with all of you. I think in lieu of kind of digging more into formal bios, maybe we can just hear a little bit, Ami, about how you ended up at Ripe.io and sort of what you spend your days doing, as a way to kind of get to know you before you dive into what the company does and what blockchain is and all that good stuff.

Ami Patel: Sure. I'd love to. Is this mic on?

Rachel Greenberger: Yeah.

Ami Patel: Okay. Yeah, thank you again, Lynn, for that wonderful introduction, and thank you Thrive and Babson for putting on this great event. As they mentioned, I'm Ami Patel, and I work on product strategy at Ripe. The way I actually got started in it was I have a background in public health, and a lot of that was a crossover into food policy and food safety. Shortly after I got my masters, I wanted to focus more on the corporate side of things, and so I went into management consulting. Within that, I worked a lot on product strategy and tech enablement within the healthcare industry, but through that I saw that there was a lot of gaps in preventive health and food policy.

Shortly after, I spent about four years in management consulting, got a good business acumen out of it, but I still had this passion for the food world. That I knew I wanted to use tech to really understand how agriculture and food and healthcare are all related. Last year around this time I actually decided to take a

position in India at a startup that was redesigning food supply chains for farm to fork food delivery.

The Indian market is very different in the sense like agriculture is huge there, but it's not as supported. Unfortunately, things such as farmer suicide are a terrible problem. All of these NGOs and startups are popping up to really innovate in this industry, and understand how they can not work against the climate but work with the climate, and really create more farmer welfare, and introduce more organic options and more safe options of food to the Indian market.

I led product strategy and market strategy when I was there, and so while being there, I knew I wanted to dive more into that same industry. I started looking up all the innovation that was going on within food and ag, and luckily Ripe was on a Forbes top 25 innovative food companies article. I reached out to our CEO, Raja Ramachandran, through LinkedIn, and luckily he was really great and really responsive, and saw a great collaborative opportunity. That's how I basically got started with Ripe.

[00:02:45]

Rachel Greenberger: Nice. What is a day in your life look like at the company? Maybe you're going to dive into that in some of the explanation, but with your role with such a fast moving startup.

Ami Patel: Yeah. I think all of us wear many hats, as any person at a startup probably knows. What I mainly do is really develop a lot of our market and product strategy, and understand what our clients needs are. Not only kind of meet them right now, but meet them in three or five years. Really designing solutions and understanding the way that we can create a UI and create more user friendly ways to really understand how they can not only use just a blockchain concept, but understand how they can use it to connect to different industries and different players along the supply chain.

[00:03:30]

Rachel Greenberger: Great. Okay, so we are actually going to zoom out, and Ami is going to walk us through the basics of what Ripe does, and what blockchain and food mean. Maybe we can switch to that piece.

Ami Patel: Yes.

Rachel Greenberger: I'm going to have all of you turn your chairs. We're going to look at some slides, because this, as you've probably gleaned from anything you've read on blockchain, is a bit complicated.

[00:03:45]

Ami Patel: Okay, so this will be a pretty quick presentation, but don't worry, we'll have lots of time for questions afterwards. Ripe.io.

Currently we have no idea who makes our food, how it gets to us, or really just what's in it. It's really because these simple questions that we all have should be really easy to answer, and we honestly shouldn't have them because we should trust where our food comes from.

Currently our food system kind of looks like this. There's a lot of cool key players, from great innovations within ag, to middlemen and distributors, to the people who cook food, down to retailers and down to how we buy it. None of it's really connected in any way.

What Ripe basically did is create the blockchain of food. I know blockchain can be a bit of a scary term for people, because a lot of people associate it with cryptocurrencies, and the finance industry. Really our use of blockchain is creating a more connected food system. Blockchain in essence is a distributed ledger system, and ultimately it's one of the most trustworthy ways to put information onto a key source, and make sure that it's transparent. That essentially it regulates itself, because everyone's able to see what's on the

blockchain, and understand where there are mistakes or voids or a mistrust of information.

The way the blockchain of food works is it connects everyone to create essentially a virtual supply chain. Then we take all that data and enable it so they can create more products for the future, and create just more trust and traceability and transparency within our food system.

This is what we call the wall of words. As you can see, within food there's many terms and many words that everyone uses. Everything from groundwater contamination, to harvesting, to vegetarian. Really food is just a wall of words right now, and every stakeholder, whether it is a grower, or if it's a distributor, or if it's a retailer, we all have our own mini language of food, but there's no way to translate it to everyone else.

What we did is we basically created connections through all of these words, and we understand how everything from geolocation, to air quality, to what the taste is, and to your palette, and how it all connects to create and translate the language of food. This creates a product history. For example, if you look at something like sustainability, when we look at food products, a lot of times we'll say, "Oh, it's sustainable, so I'll take it because I'm a consumer who cares about this." Do we actually know what that means? Is there evidence behind it?

Through creating product histories that are all on a transparent blockchain, you're able to see the soil health that was in it, the energy that was in it, if it was organic, what the water quality was like, and all the chemical inputs. It provides that evidence, that extra fortification that we need to really trust our food system.

I think there was this article that came out at the end of last year that said, like I think about only 30% of people that were surveyed actually think our food system is trustworthy, which is a astonishingly small number. Through creating product histories on a blockchain, we're able to really address those issues.

We developed what's called the Ripe.io food bundle. It's basically a digital picture of food, from when it gets planted, to in a seed, to all the sensors that were on it when it was being grown, so you can measure the air quality and the water quality. Then from the time it was picked up and harvested, to the time that it made it to the truck. The temperature it was in within the truck, when it got to the warehouse, when it left the warehouse and got to the retailer. Then finally, when it got into your hands. This food bundle is really placing a digital fabric over an analog world, and connecting all those key players.

What this means for food and ag basically is it's disrupting the business model. If you look at it right now, and if you just take away like the top half of the circle, that's kind of like what we're looking at. The farmer talks to the person in front of him. The person in front of him only talks to the person after him. There's not really a good connection, and so this actually creates a bidirectional information flow.

Now down to the consumer, if I eat an apple, I can actually tell the grocer, or wherever I'm eating it, at the retailer, or the store I'm eating it from that, "Hey, this apple wasn't that great." There could be a way I could input that information, and then that the farmer could see and really understand, and grow better food and understand what their consumer is looking for as well.

These are just a few of the benefits that some stakeholders have out of this technology. Growers really understand how they can improve their yield. They're able to take all of the data and really understand how they can create a better business model. Globally I think farmer welfare is an issue, and so blockchain can really help create those bridges between growers and their consumers, and help them create new lines of businesses.

Obviously the consumer, we get better food. We get more quality driven food. Then retailers are knowing that we are demanding this information, and so they need something that creates a stronger brand for themselves, and to really define and say, "No, no, no. This food safety recall was pinpointed to this

tomato." Now we can actually look at that crate of tomatoes and see where it came from, and prevent something like a food safety hazard at the end of the day.

I'm going to go a little bit into the pilot they did last year, which was a quest for a better tomato. Last year, when Ripe first got started, they worked with a grower out in Massachusetts. It was in partnership with Sweetgreens, a salad company, to really understand how we can track a tomato on a blockchain.

They gathered all the data. They had sensor data. They had harvest data. Then they were able to look at how it was delivered and when it was delivered, and really understand the analytics behind it, and know that harvest time I think they ended up understanding that harvest time they could have actually not delivered in one day. If they even waited ... Be a good business model, but it helps reduce food waste ultimately, and helps understand how they can better aggregate data to understand and apply it in new business models.

For the consumer, this means that they would be able to see something essentially like this. They'd be able to understand their tomato came from that northeastern zone, and it traveled all the way down south. Yeah, you can look at it and say, "I got fresh, locally sourced food." You can say it with complete confidence as well.

Yeah, that's the last slide, just for our short presentation. I think we'll head back over for a question and answer session.

[00:10:55]

Rachel Greenberger: Yeah. I want to unpack. Thank you very much. I want to unpack some of what you described, and then definitely open it up to questions that our audience may have.

Ami Patel: Yeah.

[00:11:06]

Rachel Greenberger: There's a lot of potential values and benefits, increased transparency, better data, more efficient supply chains, less waste. There's so many different opportunities for so many players along the food chain, with blockchain technology. To kind of keep it on the ground, maybe we'll stick with the Wards Berry Farm, Sweetgreen, Ripe.io case, to sort of follow the tomato. Where are we in terms of, you did a pilot, what's going to happen next? Was it just Ripe.io with Wards Berry Farm with Sweetgreen on the chain? Were there other folks on the chain? What kind of data, what did you learn from that to take it to the next level?

Ami Patel: Yeah. I think that's a wonderful question. I think with any pilot, essentially you want to understand if this use case is going to work. That confirmation was not only understood, but also in the sense of, what is the type of data that we need? What are the other ways that we could put sensors on things? We also learned that a key challenge was trying to get the middlemen on board, the distributors, the warehouses. Because a lot of times they have all the data, but they're just, I think for so long their industry has worked in a certain way that it's kind of difficult to get them on board with the technology. Understanding those challenges I think was a key aspect of the pilot.

Then also it was just one tomato. Different food works in different ways, and so we're now exploring. We're working with the Dairy Farmers of America to understand the blockchain use case for dairy and cheese products. Not only when you think dairy, it's not just like the products we end up consuming, but it's everything from, is the cow being fed quality food? How can we put biometric markers on them, and then understand how that affects the end result of the milk product that we're using?

I think it's understanding the different uses of blockchain within the food industry, and then tying all those loose ends together.

[00:13:16]

Rachel Greenberger: Is it fair to say, from what I've read it sounds like you can do a pilot with some data, and then do a similar simulation, or follow another product and then add other layers of data later on? Is it iterative with different partners adding more and more data? Because it seems like a lot of the benefits are connected to more players hooked in, and more data sharing.

Ami Patel: Yeah. I think that's exactly it. If you remember the wall of words, a language is only as useful as the amount of people who use it. When you're able to translate it to more people, that means it gets a better use case out of it. That's essentially it, it's understanding how we can get the seed companies on board, and how to get everyone from the packaging, to where the glass is coming from and how that affects the food and the end result. I think it's understanding like what key players are within this industry, and what are the different metrics that we need to measure, and understand how we can create new data out of it.

[00:14:17]

Rachel Greenberger: Then my last question for the moment is going to be, from the different types of clients that you've been piloting with, and all the different pilots you're running, or chains you're building, can you generalize about which players, from farmer to manufacturer, to distributor, to retailer, to restaurant, or in these categories where you're seeing more willingness to hop on, and where you're seeing more resistance?

Ami Patel: Yeah. I think that's a very important distinction to make. I think retailers, because they have such brand integrity, and they know that their consumers are demanding more information, are certainly the first to really show a lot of key awareness and interest in this. Now, retailers is a broad term, because you have everything from big enterprises, such as your big brands like Coca-Cola and Pepsi and Nestle. I'm sure everyone's read about how IBM partnered with Walmart to create a blockchain solution.

I think the enterprises are definitely the ones that are, I think getting the most news coverage, but they're also, because they're so large, I think they're a little slower to move on it. I think it's really the small retailers and the farm to forks, like the Sweetgreens, that are really showing a lot more innovation within it, because I think they're just able to activate it a little better.

I think growers, we get so many inquiries from all types of growers. From small farms in the Middle East, to big large farms in South America. I've had talks with executives from Chile that have come visited. Next week I'm talking to a group of French executives. I think the growers are definitely interested in how this works, because I think within agriculture there's a lot of stuff going on within sensors, and using technology and farm management software. I think from their end there's a lot of interest, but I think budget is a huge issue at times. Then also understanding just kind of like the landscape of this, and if it's really something that's worth the investment for them.

Like I mentioned, I think it's the distributors and the middlemen that are kind of like the, I wouldn't say the most difficult, but I would say that they're probably the least likely to adopt it as quick, because again, I think it's just such a disparate industry, and until now they've operated in silos. It's just a little bit more difficult to understand how we can connect them to really make the supply chain work more efficiently.

[00:16:50]

Rachel Greenberger: Yeah. Since I'm in education and not in the industry, I can say I'm not surprised that the distributors are pushing back more, because certainly there are cost benefits to the way that the system has been working. If you make everything transparent, there's going to be shifts in power in the way people move food now.

Ami Patel: Yeah, but I think a lot of the more innovative ones, we've certainly been in talks with a lot of them. I think they're seeing that they can easily benefit from this,

because when they hold so much data, they really want to understand how they can apply it in the most useful way possible.

Rachel Greenberger: Good. Do we have questions from the audience about anything you've heard about blockchain, about what Ami's explained, about Ripe.io?

[00:17:45]

Speaker 4: How much will public policy play a role in kind of the future of blockchain and food? Is that what's going to be required to get everybody on the supply chain adopted?

Ami Patel: I think, so public policy I think is huge in general, because especially when it comes to blockchain, because I think a lot of governments have very strong opinions on different use cases of blockchain. I think as food is concerned, there's definitely, well just as all regulatory affairs work, they work a little slower than private industry. I think they're going to look to the private industry and see how much the food industry is benefiting from this, and how much they can actually learn from it.

I know we've had speakers, representatives from Ripe, go talk to different government agencies, and give talks on how we're using blockchain, so they're definitely interested in it, and they definitely are aware of the positive impact it could have. Then other public policy, just as far as like people like the World Health Organization and different non-profits globally have contacted us to really understand how we're using the technology to create more transparency.

I think the interest is there, but again, I think they're just a little slower to move. I think our hope is that we're able to really show the proof of concept, and really show how this is benefiting them, especially with all the food safety, the FSMA, the Food Safety Modernization Act, requires a lot from retailers and food industry and ag industry people. I think they're finding that if they're requiring this much information, there has to be a way that they could file it in a safe way. I think it's

just a matter of time before they actually start adopting it, versus just standing back and looking at how it's going to play out.

[00:19:35]

Speaker 5: If someone is building a new supply chain system, and they're not using blockchain, are they screwed? Is that even possible now?

Ami Patel: I think, well I think if someone is building a new supply chain I'd be curious to see how they would do this in a trustworthy way, and why they would want to create a new supply chain. Because until now, really that's just been the problem, it's very fragmented. If you were to create a new supply chain, you'd want it to be trustworthy, and you'd want it to be in a new way where everyone knows what information is there, and it's able to be regulated in a positive way.

Hopefully if someone else is building a new supply chain, and not using blockchain, then they probably have a million-dollar ticket to a new kind of technology that all of us need to adopt, because until now I probably can't say that there's anything else there in the industry.

[00:20:41]

Speaker 6: Hi. My question is surrounding the economics of this. Is it making it more expensive to buy food for the consumer? If so, are consumers willing to pay that extra cost?

Ami Patel: Yeah. I think that's a great question. I think when it comes to premium food, such as when you look at what's organic and what's sustainable, I think we pay a price for that. As consumers, we tell ourselves that we know exactly where this food came from, it's good for us, it's healthy, it's quality food. Right now there is a surcharge for it. I think the hope is eventually, if more and more people start adopting this quality food definition that we're creating and circuiting on this network of quality food, hopefully over time it'll drive the price of quality food down. I think in the long run it can have a really positive impact.

Now, for the short term, the end price is the result of the retailer, and so we leave that in their department. If they want to use this technology to fortify their brand, and if that so happens to be a price increase, then that's up to the retailer. At Ripe we really are just an advisor to the retailer, because we're B2B, so the implications of how much the cost at the end would be to the consumer isn't really known, and it's just on a case by case basis.

Speaker 6: Quality is going to be new buzzword out here with food.

Ami Patel: I think buzzword is definitely something that you could use now, but I think when you look down the road it'll be something that is the definition of food.

Speaker 6: Okay.

[00:22:12]

Speaker 7: Can you talk through a little bit more of your, the tomato farm example. What were you guys measuring? How were you guys measuring it? Where is the information being stored, and how is it being accessed, and who's accessing it?

Ami Patel: Yeah. For the tomato farm, we teamed up with a device company, Analog Devices, which is an ag sensor device company. They were able to use those sensors and really track a lot of the health and what goes into the measurements of food, such as the air quality and water quality, and really understand like how much sucrose is in the tomato, down to the nutrient level. Then all that data was gathered, and then it was tracked to which warehouse it went to, to what the temperature of where it was stored was. Then down to where it actually ended up at Sweetgreens.

[00:23:06]

Speaker 7: Who is accessing that information? It's all getting generated and getting stored, but we were talking about the end consumer can then go and see where this

product's coming from, all the countries. How do they get access to that information?

Ami Patel: Yeah. At that time it wasn't piloted directly to the consumer, and that's something that we're still working on in further collaboration with them. The hope is that there will be a UI. It'll be everything, so we could, Sweetgreens, they have an app, so you could look into the app and understand exactly where the tomato was tracked. You could have a QR code where you could scan it and see, or they could have like a large board in their restaurant, and you could actually scan into that as well, and really understand where each vegetable you're eating came from. That's kind of the consumer way of it.

I think the best way to put it is a permission ledger system, is what we kind of refer to. Basically now, when you think blockchain it's very public, and that's kind of the hope for it, that everyone will eventually be able to access and see it, and be able to understand the information. Right now we call it more of a permissioned blockchain, where really it's up to the client who gets to see what information, and who gets access to understand and navigate some of those areas. They may create a new UI for the grower, so it's like a very specific dashboard that they're using, versus the one that the consumer sees.

[00:24:39]

Speaker 8: Hi. My question is about data interchanges. I also have a product focus and a healthcare technology background. As soon as you started talking about all the middlemen in your fragmented existing marketplace today, I thought immediately about HL7, which is just a mess. I mean it's a nominal standard in the healthcare space for data interchange.

Have you been architecting your platform, or are there other third parties that are in the same space with you, are you shaping together some kind of standard for how mom-and-pop A are going to send you their temperature data from their truck? Because if that's different from mom-and-pop B, and very different from

Walmart, then you're in a mode where your platform is a little limited. Can you talk a little bit about how you're architecting for scale and standards?

Ami Patel: Yeah. I think interoperability is a huge challenge. Right now we try to integrate with many different blockchain systems, and so really it's just the way that we're getting the data. It could be in an Excel sheet, it could be in tables, it could whatever way the client prefers. We have a few different options that our tech team works with. I think yeah, that's a huge thing. If Walmart is using IBM's blockchain, but then one of their partners is using our blockchain, how is that going to work?

That's something that we're still trying to navigate through, and really work with key industry players to understand if there's a way we can have a interoperability or an open innovation system to really integrate all of this. Because at the end of the day, ultimately the food system, everyone interacts with it every single day, and we're going to have to really figure out how we can make sure these systems are talking to each other.

[00:26:15]

Speaker 9: Hi. On the scale question, I had a related question. A lot of our supply chains, and chains especially across countries and continents, how is this going to scale on kind of a global scale, where we have food coming from everywhere, and how is that going to be tracked through multiple hands? Do you see any innovation there, and kind of how is that problem going to be solved?

Ami Patel: Yeah. Actually I think globally we have inquiries from everywhere. In fact, our CEO is in Australia right now because we're working with an accelerator out there to innovate the dairy industry. He actually had a meeting with the Ministry of Ag there yesterday. Then we've had inquiries from companies that work a lot in exporting to places in Asia, and different parts of South America. I think the scale of it, it's not even a question of whether it's going to scale. I think it's a matter of, how are we going to do this in the most efficient way?

Because I think there's a lot of regulatory ways to navigate it, and I think different countries require different policies, and have different labels and standards for food. I think it's really understanding how we're able to navigate that part of it, versus how to understand if that's something that they even want. Because I think more and more, since it is a global industry and everyone's importing and exporting everywhere, that I think it's in their benefit to really adopt this earlier rather than later.

[00:28:02]

Speaker 10: You touched a little bit on the permission blockchain phase. Is there a point in your company's road map where, if more players were, say 100 to 1000 more companies or suppliers were joining as more distributors, would there be a point where you would convert from the permission blockchain to a more public blockchain that would require like a tokenization like cryptocurrency?

Ami Patel: Yeah. I think, I was waiting for the token question, I always get it. No, that's a wonderful point to bring up. Yeah, right now definitely permissioned. Again, it's up to the end client how much they want to disclose publicly. Now, at Ripe we're trying to really understand how best to utilize a token system. That's certainly something that's on our priority list that we discuss every single day. There's other companies that are trying to do something similar within the industry, and they have different uses for a token system or a crypto system of their own.

I think right now we're definitely just trying to observe and understand the best way. I think to your point, creating a more public system that may be like an open innovation platform of some sort, I think is a great way to really understand how we can make it a more public system that globally everything from like a non-profit to a small farmer can use, that may not be able to afford the technology, but wants the data, or wants to contribute to the data. I think that's an excellent point.

[00:29:40]

Speaker 11: When you talk about permission ledgers, in terms of like reading and writing data in the chain, how does that work? Is data for all people who have been granted access to the ledger open for everyone? How does that scale to longer supply chains where middlemen are dis-incentivized to reveal their identities in fear of being cut out?

Ami Patel: You're asking how people are able to contribute data and then have it segmented to only certain parties are able to see it?

Speaker 11: Yeah, sure. If I was allowed to join the Ripe blockchain, what would I see in the system, or would I only be contributing data, and is that information centralized to the buyer, or whoever's telling me to join the system? Second, how does it scale to larger, longer supply chains?

Ami Patel: Yeah. That really just falls into data segmentation. I think with most technologies, even if it's like a cloud based system, you're able to always have different permissions. Like you mentioned, let's say someone like a distributor may not want to give their data, or may not want to have everyone see their data, and so if we are working with a distribution client, then it's up to them ultimately to really tell us who is allowed to see what at the end of the day, because it's proprietary information.

A lot of times we're now, our solution is to create a UI for different people involved. I mentioned this earlier, but if I was a consumer, most likely I don't want to see every piece of information, because that's just a lot for one consumer to see.

Rachel Greenberger: I would assume there's a translation that needs to happen.

Ami Patel: Exactly. Even to put data onto the blockchain, it's definitely you'll have like your own account and password, and have a different sort of permissioned way to contribute that data. Ultimately I think you're asking ownership sort of. Ownership is really right now up to the client, but the thing is we're finding that if they're willing to explore this option of using blockchain in the food system, they want to

be as transparent as possible. We're finding a lot of times, if it's just extremely private, proprietary information, then they may not want everyone to see that, but for the most part they're pretty open to having everyone along the supply chain access a lot of, most of the information.

[00:32:16]

Speaker 12: Kind of a follow up to that question. As a consumer, if I want to see the product that I'm about to purchase, and I want to know every step along the supply chain, although some of them have been omitted by say the client you're working with, is that not dishonesty by omission, if we're not seeing some of that data? In a situation where the blockchain sort of thrives on its trustless-ness, how do you reconcile that?

Ami Patel: Yeah. I think that's a good point. I think it's important to make the distinction that it's not that they're omitting the data. I think it's just in the form that we're seeing it in. I think to me, I think if I saw a bunch of data points on like an ag sensor, it may not make sense to me, but I think it's the way that the analytics we develop around it, and looking into like the insight behind the label that I'm able to see that really creates that clear story and picture of it.

I think when it comes to data segmentation and ownership, it's more of a, how are we going to show this to different people to help them understand it? Versus just seeing a bunch of data points that someone could not understand, and just could take our information and run with it somewhere. I think it's more of just understanding how we can just create that food bundle out of it, and track it and create just a more relatable story for everyone involved.

[00:33:50]

Rachel Greenberger: Yeah. I'm glad you asked that, because that was where I was going to go, is sort of the high level, the wonderful Forbes blog article that came out last fall from Ripe.io, which is how you guys appeared on my radar. Is among a suite of articles that have come out recently that talk about full transparency, and

traceability, and authenticity. It's a distributed ledger and everyone gets to see all the transactions, and it's sort of very glossy and sort of idyllic sounding. Then what you're walking us through tonight is more sort of the nuances to particular client relationships, and where we are in the stages.

It sounds like from the audience questions, a lot of folks here understand the technology. On that point, I am interested in kind of where the reconciliation is between sort of the ideal picture of all these benefits and possibilities, and where we can go with it. Where we are now in the dynamics of Ripe.io as a startup company, with certain services, and has clients. The clients are then dictating who's going to be on the chain and who's going to see what, and how are we going to onboard new folks along the way?

I guess my question, to sort of bring it back up a level is kind of, where are we between the beginning, when it's very buzzy to talk about blockchains and food. Next week there's the World Agri-Tech Summit, there are four sessions on blockchain at the World Agri-Tech Summit. Where are we between the, "Ooh, this is really exciting and new possibilities in food." You guys are on the front lines of that, and getting to where consumers, eaters of food, are going to say, "Aha, we've arrived. Now I have a translated, trustworthy suite of information that I didn't have before about the food industry."

Ami Patel: Yeah. I think to your point, the conference next week has like four blockchain sessions, so I think everyone is trying to really understand blockchain. It's like this very like new, cool concept that everyone wants to know. Specifically, we have been approached by all sorts of food products, and we just have so many things coming down the pipeline. Everything from wine, to different types of poultry, beef and chicken, and understanding the food safety hazards behind that. We've been in touch with different sort of packaging companies and things like that.

I think the way it's going to get to the consumers is going to be very soon. I think it's a matter of who is going to really implement this in the fastest way possible. I

know we have tons of clients that are definitely about to start in this upcoming month, and so we're all very busy with that. I think pretty soon it's going to be a more tangible concept for everyone to really understand, and then innovate within that, and learn from our mistakes, and go forward with how we're going to create this more transparent, more traceable system.

I think a huge challenge, I will say that I've seen, is authenticity. I think that's a tricky word a lot of times, to prove authenticity. Because essentially, if there is a crate of apples, and there's like a code on it that the distributor will scan and then pack up. Human error's always going to be an issue. If someone comes and switches out that crate, then we can't prove the authenticity. I think that's the trickiest part, of always having that concept of human error.

Then eventually I think the beauty of a blockchain is, at least we're able to track that exact crate down, and really understand if there was like a hazard out of it, then we're able to really solve that issue, and then prevent like a whole truck of apples from going to waste. I think the challenges definitely fall within authenticity, and then also I think just large enterprise adoption, just because they're a little slower to move on it. I think the smaller clients are certainly the ones that are going to be the ones that are heard pretty soon.

[00:38:04]

Rachel Greenberger: You have so many different types of clients doing so many different things, but is there a trend line in terms of what the clients are solving for? Is it food waste? Is it food safety? Is it premium benefits? Regenerative agriculture is the new organic. What are the sort of ones that are bubbling to the surface, either for Ripe.io or the nascent field of blockchain food companies, that these companies that are your clients are pushing for? Like, we got to get this going.

Ami Patel: Yeah. I think quality curation is huge. I think a lot of times, just for brand awareness and differentiation, that's like a huge factor driving a lot of this. That's more for the farm to fork clients.

I think, for example, we were approached by a small lime company, and their whole reason to basically enter this and want to use blockchain of food, is because they know that a lot of their large scale retailers that they source to, such as if it was like a Kroger or a Walmart or somebody. They know that these large scale retailers are going to start using blockchain pretty soon, and if they don't get on board now, then they're going to be the slowest in the system. They're actually one of the first people that we're working with pretty soon to implement this technology.

I think it's the retailers and the farm to fork that are really driving it from the consumer end, but I think it's all the middle people, and the smaller growers, that are understanding that the industry is moving this way, and so they're trying to learn as much and find ways to really adopt this in the quickest way possible.

Rachel Greenberger: Great. Other questions?

[00:39:49]

Speaker 13: Yeah. I have one. Can you talk a little bit about the role that Ripe plays on the sensor side? Is it an advisory role, and is the sensor industry as a whole, is it helping, is it hindering your progress? Because it seems like that's a really key hardware component in making all of this, all of these pieces work together.

Ami Patel: Yeah. As far as Ripe is concerned, we have a key advisor on sensors and IoT and the latest and greatest that's going on in the industry. He's wonderful as well. I think a lot of times, if the growers have sensors, then we definitely work with them. Sometimes they look to us to advise them on it. The pilot we did last year, we teamed up with Analog Devices, and so that was a partnership effort. I think a lot of the new consumers that we're onboarding, if they don't already have sensors, then they're looking to us to really help them understand the best way to integrate them.

[00:41:51]

Speaker 14: Hi. You had a question on standards, and you talked about your blockchain talking to Walmart's blockchain. Why do you need blockchain to talk? A relational database talking via integration layers to different entities could solve the problem just as well. Why do you need a blockchain for that?

Ami Patel: You're asking why we need interoperability?

Speaker 14: No. Interoperability via systems other than blockchains can be equally effective. Why do you need a blockchain for that?

Rachel Greenberger: What are you thinking of? What is equally effective? Can you give an example?

Speaker 14: Unless there are standards available where each participant is conforming to, and exchanging information.

Speaker 15: Just like an API.

Speaker 14: Yeah. You could just have an API. I mean Walmart exposes an API that you call, and you expose an API that Walmart calls. The systems that Walmart's running and you're running don't need to be on blockchains. What's the additional value that's coming from doing this on blockchains?

Ami Patel: I think that falls into the category of trust and regulation, and not having, because right now think about it, people are able to obviously hack into other systems and things like that. Yes, blockchain is in a nascent stage when it comes to different types of use cases, and so it could, I'm sure it does have holes in it where it could be hacked in different types of blockchain platforms.

I think the main reason that someone like a big system like Walmart is adopting blockchain would be because they understand that it's a key way through, whether they're using smart contracts, or if they're using a token system, or if they're using a public platform, that there's multiple ways to regulate it and trust it and provide that stamp of approval that they're looking for.

I think as standards are concerned, I think public policy will play into that a lot. I think with regulatory standards and different ways that we're now exchanging information, there's going to be a way that we need that all of these systems talk to each other. Currently, because it's so siloed, I don't think that the solution lies in fixing what they have now. I think it's more in implementing the new system in a new way that we can all communicate with each other. Did that answer your question? We can talk afterwards too, if you like. Yeah.

[00:43:24]

Speaker 16: What percent of the work, based on the standards stuff, what percent of the work do you feel is just taking existing systems and figuring out essentially, of the value chain, who's doing what? What are their interests? What is the data that they have, and what percent is the blockchain in tying it together? As the previous questioner asked, yes, there's existing systems, where do you sort of see the needle falling between those two?

Ami Patel: I'm not sure I understand the question.

Speaker 16: The question is, there's plenty of existing systems out there. The people utilizing them have their own interests. What percent of Ripe's work is in getting those interests to align and what percent is the technological implementation of the blockchain as the solution?

Ami Patel: Sure. I think at Ripe we often say that we are a, yes, we use blockchain and blockchain technology is the product and the services that we provide. At the end of the day, we are trying to create a more transparent and quality driven food system. I think that's an important distinction to make, because a lot of the consumers that approach us, they know that there's different technologies out there. Yeah, right now whatever they have, they could probably use. A lot of them use supply chain tracking and different platforms for those kind of things.

I think that their understanding and they're finding that there are holes in those systems, and there is a void of trust within that system. It's not only taking their

current system and just trying to fix it and iterate it and try to bring it up to the standards of today, but I think they're understanding that eventually down the road they're going to need something that's just a lot more, not only transparent, but also just trustworthy. In the sense that when they look at a piece of data, or that they trust to get their stakeholders and partnerships involved, that they're able to work together on a single platform, versus trying to integrate all these different things that they may not trust eventually.

Rachel Greenberger: My understanding is that's the contrast. It's not actually a chain right now. We call it a value chain or a supply chain, but you have a series of individual relationships that have their own ways, some of them on pieces of paper, to do their individual transactions in a bit of a black box.

The promised land, from everything I've read about blockchain, is that when you onboard someone, whether it's a closed permissions ledger or it's a totally open ledger with translation for different partners along the way, that everyone gets a copy of everything that happened to that product. If Sweetgreen wants to build its brand on the back of, this is regenerative, the farmers dance in the moonlight, it was this many days old, blah, blah, blah. Every single partner has some version of that data to verify that that is in fact the case.

It's an incredibly inefficient system as it exists, why we have really expensive food recalls and all these other sorts of things. In the Walmart case, one of the articles on it was, "Okay, we're going to track this mango. Do it. It takes seven days. Okay, now we're going to test it with the blockchain." It took something like 20 seconds, because everything was synced up. That's my understanding of the ideal situation.

Frankly I think that there is this, you gave the stat of 30%, I'm surprised it's as high as 30% of people trust the food system right now. In sort of a crisis of trust in general, and alternative facts here, there and the other place, the idea that everyone gets a copy of everything that happens to that product, and that

someday the end eater can say, "I'm not just getting brand washed about this." I think there's a lot more to it.

Ami Patel: There is. Again, I think we're looking at it from a very consumer perspective, but the implications for blockchain even in financing for agriculture. Next week we're hosting a workshop at the World Agri-Tech Summit, and we have key speakers speaking on that. I think we look at it from very much like the food that we eat consumer perspective, but I think it holds benefit for everyone along the supply chain, and different use cases within that. I think the more and more we start onboarding new clients, and launching this new technology with them, we're going to find the different benefits for each stakeholder.

[00:48:06]

Rachel Greenberger: I actually will come right here, but I want to go back to where you started about your history with farmers and the agriculture sector in India. Because one of the things I learned from Ripe.io from the press you've put out is that the opportunity down the line for farmers to instantaneously find markets. We need X amount of this right now, and for them to be able to quickly sell something that otherwise would be rotting in the field to new channels, is very exciting for farmer's wages, and for efficiencies for their land, and markets for their product.

Ami Patel: Yeah.

Rachel Greenberger: Yeah. Benefit for everyone.

[00:48:42]

Speaker 17: We kind of had a few references to this, but how do you actually generate trust and validate information in the system? Like in the Bitcoin network, you can do the math, and you can calculate that someone transacting with me has sufficient funds to execute this transaction.

In the cases in which we discussed here, someone might be dancing on the field, someone might say that they have a premium product that you can't necessarily verify the processes that it's gone through. How do you validate that information, especially when you're incentivizing people to pay more for a product that is sustainable or something like that?

Ami Patel: You're asking basically how do we make sure that I, as a person contributing data to the blockchain, am not lying about it?

Speaker 17: Yeah.

Ami Patel: I think again that goes back to authenticity and human error. If it's like a sensor, or if it's like some sort of technology that's basically taking data and putting it on blockchain, that's more trustworthy, I agree. If it's someone from a warehouse saying that they picked up a crate of tomatoes and put it somewhere and then switched it out, yeah, we can't account for that.

I think that's a huge problem, but I think the more and more we start launching this, there's just going to be different ways that we get IoT and sensors involved that a lot of times I think the margin for human error is going to become more narrow within that scope. I think people are going to be able to trust it a lot more, knowing that if something was scanned in at a certain time, then that's trustworthy information. Because you can't, once it's on the blockchain, you can't really take it down, you can't tamper with it after that.

I think the way that we contribute the data will merge into a more trustworthy way. Versus those small errors that we'll encounter, which are inevitable, and I think understanding how to navigate around them will be a huge challenge for all of us involved.

[00:50:44]

Speaker 12: Hi again. You just mentioned human error. I'm also curious about sort of like human subjectivity. I know that Ripe.io is working on taste profiles, and I'd love to just learn a little bit about how you guys are approaching that.

Ami Patel: Yeah. I think that's an exciting topic, taste profile, which are actually really difficult to do. This goes back to what I mentioned at the beginning of this talk, is that different food products work in very different ways. To actually create a taste profile, because it is so subjective to everyone involved, is really difficult. It's understanding, we specifically are working with our consumers to partner and understand how they define taste profile, and how they want to define it to their consumers. Because I think there is a lot of subjectivity involved in that, and so working hand in hand.

We have explored trying to partner with food scientists, and different people within the industry to really navigate this world of taste profiles. I think that's like the exciting thing that we as consumers want to see, is to understand the flavor profile, and the phenotypes of something. Certainly working on that, and hopefully we'll have some exciting stuff to release to you all pretty soon.

[00:52:05]

Speaker 19: You talked about authenticity as a challenge about interoperability between blockchains. Then I think another challenge you've touched upon is getting distributors and others in the supply chain onboarded. What are some of the opportunity spaces that you see as entrepreneurs looking to capitalize, or look at opportunities within the space of blockchain food? Where do you see kind of most opportunity needed, and where do you see kind of the industry or the movement going towards?

Ami Patel: Yeah. Like I mentioned dairy is very big. I think not only with dairy you get the end product of like cheese and milk and the things that we consume, but more and more people are concerned about the welfare of animals. We see biometric marking on animals and tracking that data as a huge thing that's going on within this space.

Working more on the grower side, and understanding how we can work hand in hand with essentially the provenance of something, or the origin. The seed companies are getting more and more involved, where before they were a very separated industry. You'd be surprised how separated seeds are from the rest of the food industry. I think that's a really great opportunity.

I think also the tech challenges involved on working on the grower side. A lot of these places are remote areas that probably aren't as connected as we would hope, so I see a lot of innovation within that as well. Then like you said, the onboarding of distributors. We're finding that we have a couple of distributor clients coming down the track that we're launching pretty soon, and so their challenges are really more of like the global scale, and understanding how to distribute differently to their global markets versus the standards that they use here, versus like somewhere in Asia. I think there's some opportunity there.

Then I think the other opportunity I've seen and heard a lot is just understanding how the interoperability works together, like you mentioned. I think a lot of people look to us to advise on which blockchain platform is the best. I think that's something that is something that all of us are trying to navigate, because there's literally a new platform out all the time. Understanding how the token system can work into that, and the best way that we can get everyone to scale it at the same useful way, is probably a challenge that we're working on.

Rachel Greenberger: Great. Let's take the last question, then we'll wrap up the formal portion.

[00:54:52]

Speaker 20: Thanks. I want to ask a question from the perspective probably of potential customers of yours in the future. I work in vertical farming, so we grow a hyper local vertical farm that can deliver leafy greens from harvest to customers within 24 hours. There's no middleman, versus the very traditional leafy green supply chain is from growers, to harvester, to packer, distributor, and customer.

Because most of the lettuce are grown here in California, the lettuce that you eat, say in Boston, are probably already seven days old. We're already providing, so think of us as like a home garden of yours, in fact we are in the backyards of Babson. We are already providing much more transparency to consumers. How are we joining blockchain are going to benefit us?

Ami Patel: Yeah. Are you working directly with the consumer, or you're working with businesses that eventually sell?

Speaker 20: Both. We build farms either right adjacent to distributors, or sell throughout retail stores.

Ami Patel: Okay. Well to that I would say the blockchain, as far as like your B2B consumers, if they're using it, and if that's something that they wish to provide to their consumers in the information they wish to provide to their consumers, then I would say that it's in your benefit to partner with them and to understand how you can integrate this technology in some way.

I think to the end consumer, like me, if you're just selling directly to me, a blockchain for my benefit may not be as high as like to the business. I think the analytics you could run with putting all your information on a blockchain, is probably where the business itself would certainly benefit. Understanding, I know that you know exactly where everything comes from, but I think it's trying to ... Well, let me ask you this. Do you know where your seeds come from? Are you just sourcing from one company?

Speaker 20: We source from various seed providers. The few big ones.

Ami Patel: Yeah. I think that's a great example of that's something that you would definitely benefit on a blockchain. Then understanding which seeds are basically giving you the best harvest. Working with different seed companies, especially in that realm, to really take that data and make it more useful, not only to you, but to them as well eventually.

Speaker 20: Thanks.

[00:57:35]

Rachel Greenberger: To roll this all up, it sounds like it's definitely early days, but very, very exciting. Thank you so much for being here and teaching all of us, and thank you for your great questions. We're going to be here for the next 45 minutes or so, and we can definitely continue the conversation over some small bites. Do you want to say anything to wrap us up?

Lynn Santropietro: Thank you Ami. Thank you Ripe. Thank you Rachel. Yes, please join us out here for drinks. We record all these sessions, so thank you for dealing with the microphones tonight. You can check out this conversation, as well as others we've posted in the past, at thrive.freerange.com. You can check the Babson San Francisco site. We have links to them there as well. Thank you for joining us tonight. Thank you both.

Rachel Greenberger: Thank you so much Ami.