SM253 | 10.18.2025
Re-engineering Tokenization | Episode 1

Josh Crumb, Founder & CEO, Abaxx Technologies + Ian Forester, Head of Product, Abaxx Technologies

This week, we kick off our new series *Re-engineering Tokenization* with Josh Crumb and Ian Forester, CEO and Head of Product at Abaxx Technologies. SmarterMarkets™ host David Greely sits down with Josh and Ian to discuss asset tokenization and Abaxx Technologies' approach to it – focusing on secure digital identity, privacy, and legal finality as the foundations for institutional grade commercial transactions.

Josh Crumb (00s):
So assets, securities, commodities, the rights and title to commodities. These all live in the law and these all live offline, so it's very hard to reconcile that natively into the ledger. That was the problem that we have been working to solve is not just reconciling the ledger, but multi-party reconciliation of legal claims. That also can give that, again, that machine readability, that machine verification that can speed up commerce and speed up trust in the system.

Announcer (29s):
Welcome to SmarterMarkets, a weekly podcast featuring the icons and entrepreneurs of technology, commodities, and finance ranting on the inadequacies of our systems and riffing on ideas for how to solve them. Together we examine the questions: are we facing a crisis of information or a crisis of trust, and will building Smarter Markets be the antidote?
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David Greely (01m 19s):
Welcome to our new podcast series, *Re-engineering Tokenization* on SmarterMarkets. I am Dave Greely, Chief Economist at Abaxx Technologies. Our guests today are Josh Crumb and Ian Forester, CEO and Head of Product at Abaxx Technologies. We will be discussing asset tokenization and Abaxx Technologies approach to it, focusing on secure digital identity, privacy, and legal finality as the foundations for institutional grade commercial transactions. Hello Josh and Ian. Welcome back to SmarterMarkets.

Josh Crumb (01m 54s):
Hey Dave, it's great to be here.

David Greely (01m 56s):
It's great to have you both here again. We've talked a number of times over the years about the ID++ technology you have been building at Abaxx and how it's at the core of your approach to using technology to build smarter markets. You have announced the first three of a series of pilots demonstrating and providing the use case of what you've been calling digital title in real commercial transactions and because the commercial need for these new tools is so great, there are a lot of companies working on similar problems, drawing on similar technologies, all of which could be called asset tokenization, but using very different approaches. So in this series, we really want to talk about what tokenization is, why it's so important, the different ways it's being applied, and why those differences matter for achieving real commercial objectives and this is certainly the moment for these conversations as this week BlackRock, CEO, Larry Fink caught everyone's attention when he stated that the financial industry is quote at the beginning of the tokenization of all assets. And so with that background, I would like to start kind of at the beginning and maybe just start with the basics, Josh, and could you just kind of tell us what do people mean by the tokenization of an asset?

Josh Crumb (03m 18s):
Yeah, thanks Dave. Look, there's nothing new about digitization obviously. We have been in a path of digitizing finance and you know, as I think I have said on podcasts before that the history of markets, it runs completely in parallel and lockstep with the history of information technology because at the end of the day, it's the information, it's the discovery of prices and quantities. This is all about data and the flow of information. You are the economist, Dave, so I won't remember exactly, but perfect information was always the

biggest assumption in markets. So the digitization has clearly been an ongoing path for decades, but when we talk about tokenization, it's really the next step. I will let Ian define tokenization or, or someone probably a little bit closer to IT systems. In my mind, the difference between digitization and this ongoing path and tokenization is just you are giving more and more information for the machine to read.

Josh Crumb (04m 18s):
We have been building our pre-trade and post-trade systems and these closed databases, but the reconciliation of those databases and systems has still been very manual. Everyone doing it in parallel, double entry accounting of markets and finance. But the more that we can automate in machines, I think that's really the path we are on when I talk about tokenization. And now, you know, very broadly we also talk about blockchain tokenization and smart contracts, but we think there is a lot more information that needs to be machine readable than just simple smart contracts. So, we will, I know I am sure we will get further into that, into this series, but really it's just the ongoing path of digitization and machine readable processes that aren't so manual and paper-based.

David Greely (05m 07s):
Thanks, Ian. I would love to turn to you in terms of the practical aspects of tokenizing an asset and in terms of the technology that's used for tokenization, how are you looking at that and what technology are you drawing on?

Ian Forester (05m 22s):
When you are talking about tokenization, you are almost universally talking about public-private key cryptography. And I think it's worth making a distinction between digitization and tokenization. And one of the ways that we draw the distinction is digitization. You can think of taking a paper form and making it a PDF, but fundamentally when you are talking about securing that data, you are still likely trusting a platform. You are still likely trusting a service provider, an internet service provider, and so doing, you are giving them a certain amount of power over your transactions. I think where we like to draw the line between digitization and tokenization is that with tokenization, you are really trusting the cryptography. So it's, it's agnostic to the platform and this opens up and, and sort of breaks those silos of liquidity that can form under just a sort of a digitization framework.

David Greely (06m 16s):
And I would like to come back to you, Josh, with the use case because whether it's the futures contracts that you are launching through Abaxx Exchange or the products you are developing at Abaxx Technologies, you are always focused on meeting the commercial needs of the market. You are always very intentional in making that first. So I wanted to ask you, what's the commercial need for tokenization that you are trying to meet right now?

Josh Crumb (06m 44s):
Absolutely, and look, this series that we go through will probably get into the weeds sometimes of how the watch is made. But we like the old adage, people don't care how the watch is made, they just want to know the time. That said, I think it is important sometimes when you have new technology to understand a little bit the how and the why. But focusing on the why, we come down to the movement of collateral, particularly when you are talking about futures exchange and the collateral that's needed in this market. The global clear derivatives industry is sitting on somewhere in the order of magnitude of a trillion dollars in, in assets as collateral initial margin and the variation margins as markets move. But that collateral is still predominantly moved in very slow settlement systems. Sure the trade can happen in, you know, fractions of a millisecond, but the actual clearing and, and the movement of collateral in the settlement still takes many days, particularly if we're talking about international commodity markets.

Josh Crumb (07m 43s):
So that's really the use case. Now blockchain markets and digital markets, digital asset markets has been very interesting and for many, unlike a lot of markets, it really developed in the retail outside of institutions and so there has been a focus probably over the last 10 years on general concepts like democratization, right being able to buy an equity share of Apple or something in, in markets all around the world or moving foreign exchange or dollars around the world, unlocking illiquid markets like real estate or art. There has been this very retail focus of things that are, you know, broadly known as democratizing access. But if you look at what institutions are really thinking about, it's very different. Again, it's the movement of collateral because ultimately if you look at some of those markets that we talked about, even, even the other day, people are like, oh, now you can buy income from real estate on the blockchain.

Josh Crumb (08m 39s):
It's like, well, we have had pretty good markets for REITs for a long time. Institutions have been able to make this. Sure it's not as accessible both in the information or maybe even the brokerage platform for retail, but blockchain's not really solving new liquidity markets in real estate, right? So we look at these two very different problems from a retail or a more institutional context, but the institutional side, that movement of collateral, you know, really is a very big deal. And particularly if you are looking at our markets, which are really centered from a physical and supply and demand side, is really looking at Asia, and I am using very rough numbers here, but say something like 70% of the world's commodity trade happens in Asia, but at the end of the day, the financing is still predominantly in the US and London. And why is that? That's where the dollars are, that's where the collateral is. And so if we can free that collateral to be as mobile and at center of gravity, move closer to Asia, we think that that just opens up more financial infrastructure, more flow of goods, more markets. So that's why institutions, and that's why Abaxx and our clients are really focused on the secure and real time movement of collateral, particularly out in Asia.

David Greely (09m 54s):
And I wanted to follow up with you on that, Josh, and I wanted to ask you, why do you think that the current approaches to tokenization, many of which were developed more, as you said in the retail or the cryptocurrency space, why do you think those approaches won't work and need to be re-engineered to meet these more institutional commercial needs that you are discussing?

Josh Crumb (10m 17s):
We can kind of go through our framework and the way we think about legal finality privacy embedded identity, so all of the things that are required, but stepping back at its simplest, I like to say in the early crypto markets, when the asset lives in the ledger, the ledger reconciliation is what matters. When the asset lives in the law, it's the legal reconciliation that matters. So diving into that phrase again, what does that mean? So really the revolutionary technology of Nakamoto consensus, what we know as Bitcoin and the Bitcoin blockchain, you know, was really, really the, the fundamental technology here of what some might call triple ledger entry accounting, right? Like, so we've always had this double entry accounting since the time of the Medici or whatever it is, the assets and liabilities. But what blockchain really did is by creating that incentive system and that proof of work token that lived in the ledger, it allowed an incentive mechanism for that ledger to be reconciled all over the place without a central counter party.

Josh Crumb (11m 19s):
And then Ethereum and Solana and a number of these blockchains have taken it to the next level with proof of stake. But again, the asset itself and the consensus mechanism and incentives are an asset that lives in the ledger. So for 10, 15 years, we have been very focused on how fast and what's the finality of settling this ledger. But again, the problem is in securities, the asset lives in the law, it doesn't live in the ledger. So at best what we've seen is these ledgers that are, again, multi parties can reconcile them in real time, which is great, but they ultimately are just pointing offline to a legal system somewhere else. So assets, securities, commodities, the rights entitled to commodities. These all live in the law and these all live offline, so it's very hard to reconcile that natively into the ledger. That was the problem that we have been working to solve is not just reconciling the ledger, but multi-party reconciliation of legal claims that also can give that, again, that machine readability, that machine verification that can speed up commerce and, and speed up trust in the system.

David Greely (12m 28s):
And I want to come back and dig into that a little bit more as, as we continue this conversation. But first I wanted to ask you, Ian, when you hear Josh talking about how we need to re-engineer tokenization and achieve these slightly different objectives, I wanted to ask you, do we have the technology now to accomplish that re-engineering or is that something that has to be developed?

Ian Forester (12m 50s):
Yeah, absolutely, I think the cryptography that underpins blockchain and, and really other systems all over the internet, including, you know, transport layer security that forms the foundation of HTTPS and ensures that we can use websites safely, that cryptography is very robust and can be relied on. It's really about how, how you organize that, right, and how you organize, what is the sort of foundational unit that sort of triggers things to move forward. The way that we look at it is we think that the system as it is, is it's got thousands of years of Lindy, right? It's got all sorts of case law around it. We don't think we need to throw that system out, we just think we need to make it move faster. So applying cryptographic technology to that system, we really looked at it from the bottom up and said, okay, does a blockchain make sense here?

Ian Forester (1351):
And if not, what are the sort of components or the pieces that do make sense and how do we tease those out and apply those in a way that that makes the most sense for solving the problems of the market and for us, that comes back to the, the cryptographic signature. That's the event, right? That is the trigger event. So then it becomes how does that signature get organized? How does it get recorded? How do we make sure that the four pillars of any transaction, which are secure intent, a secure asset, secure identities and secure records, how do we make sure that those things all stay secure so that the transaction can be recorded as to the intent of the parties and so that it can't be re-characterized later on.

David Greely (14m 41s):
And Josh, you spoke earlier of when you look at the pilot programs for digital title, emphasizing that your approach provides that trusted identity, privacy, legal finality. And I want to dig into each of those pieces, but first just to kind of set that up, could you explain for people who may not be as familiar, how do you think of your digital title as a form of tokenization? How should people be relating those two things

Josh Crumb (15m 09s):
Without getting in again into the weeds of the specific technology it's kind of back to what Ian just said, is moving that trusted cryptography and moving the machine, doing more work to build that trust in real time and, and audit trails and log records and so forth. That's the part that we are trying to solve for as far as the underlying agreement, the buy sell, the securities law, all of that complex ends up looking like a hundred page documents sometimes. How do you make all of that machine readable and trusted so that we, that we do have those electronic records that stay sort of permanent secure and the only people that could sign them are, are the ones that are authorized. Just again, keeping it high level and simple, I like to say right now we still see, particularly in the financial system, we still see paper record keeping as more secure and better than electronic commerce is more important than e-commerce.

Josh Crumb (16m 06s):
And that started flipping where the e-commerce became more important than offline commerce at some point. But when we're looking at record keeping, an e-signature still is kind of mentally inferior to, to a paper-based system in a quarter law and record keeping. But when we can get to the point where it, it's more certain people just mentally and data wise feel more secure that Josh signed this paper electronically than somebody analyzing my, my handwriting as you know, squiggly in court to see if it was me or not. When it becomes more certain that that that happened electronically, then e-signatures become more important than paper-based signatures and we are not there yet. I think the wave of digitization, particularly during the COVID period where firms got more comfortable with DocuSign and hello signs and zoom calls and all of these things, I think that moved the world a long way, but for the absolute bedrock of trust, we're not there yet. And so this is the part that we're trying to solve, that solving that trust where electronic signatures become more comfortable and more valid handwriting signatures and that's the ultimate goal that all of this technology is trying to achieve because once that happens, again, things become machine readable and just infinitely faster and scalable than, than the human form.

David Greely (17m 28s):
And I would like to follow up with you on that because as you said, many of the other approaches to tokenization are very ledger focused and it's like, let's get the ledger right, let's get the ledger right. Clearly you are focused more on the signature and who is doing the signing? The world of pen and paper, that's still considered superior, right? We've got all the tools of that. We've got driver's licenses, photo id, passports, notaries, all sorts of things built around proving identity. But with your approach to socialization and through digital title, you have really been focused on solving the identity problem first. How do you do that? Maybe first would be an elaboration on some of what you said perhaps so like why did you choose that path? Why this identity first approach to tokenization?

Josh Crumb (18m 18s):
Yeah, so I am a mining engineer, so I like to keep things very simple, slow moving systems and not always necessarily reinvent the wheel. So thinking about sort of the first principles or the foundations of why is a signature on a document so important to commercial practice. Ultimately it's this concept of skin in the game identity, skin in the game. It's about who's signing that document. If it's a person with great responsibility, great power, that's very different than just somebody, just a random person signing it, right? That's why in corporations we have signing authorities and ultimately those are people that are the most trusted, perhaps have criminal liability for defrauding their signature. So that signature is always the foundation of our systems. And then, yeah, back to your point, notaries, you know, why is a notary so important? They are verifying as a third party with their reputational skin in the game, right?

Josh Crumb (19m 10s):
If a notary breaks that law, there is higher consequences than your neighbor witnessing a sign that nobody knows who your neighbor is. So that all of this foundation is built on this principles of skin in the game. I am mistaking re my reputation potentially legally or criminally, but likely a lawyer would be disbarred. So there is always these different thresholds. So our entire trust system is really built on that first principle of identity skin in the game. So again, if we are trying to digitize, I am not trying to reinvent the wheel, let's keep those same principles that have worked and built organizations relatively like hierarchies and business and commerce and governance for centuries. And let's just try to take those same principles and make them machine readable, make them to be able to move faster. But we can't throw out that human trust foundation. You can't start over. So again, back to the point of tokenization and our approach versus others.

Josh Crumb (20m 04s):
So if you think about the blockchain wallets, again, if we were talking about an asset to move around pseudo anonymously in a public private key pair where you are, there's no specific person, it's just a wallet address. Again, that's fine in certain use cases of moving these digital assets tokens, but that doesn't work in the law, right? In the law you actually have to know who is the signer. It's not just a public key address. And so again, that that's why these systems are not necessarily purpose built. And so we have to put all of these other wrappers of these other things offline to try to match the offline law, the offline identities to the online, you know, ledger reconciliation. So we have just taken a, a very different approach than putting privacy or identity or all of, or legal finality, rather than putting on those on top of a blockchain, we have kind of rethought the system of let's make that the foundation of what we do rather than a bolt-on to a different system.

Ian Forester (21m 01s):
In terms of the ledger, I think this is pretty important with sort of your standard blockchain ledgers, which is a very natural jump for people when they think about digitizing real world assets using cryptography, the reconciling those transactions. It's a bit like balancing your checkbook on a whiteboard, right? It's kind of there for everyone to see and check your math and so that's kind of where we started with, hey, this is a challenge that we need to overcome, but then thinking more deeply about it, we realized that there already are so many ledgers, there is so many ledgers that are trusted. You think about a, the ledger at a bank or the ledger at a fund. These are already trusted books. We don't fundamentally have to solve the ledger problem. And by introducing another ledger, well now you have two sets of books that you have to keep reconciled.

Ian Forester (21m 51s):
One that may be reflecting the intent of the market, the other that may be reflecting the underlying sort of legal claims and legal state of the assets. So, you know, we took the approach of saying, okay, we are going to digitize and we are going to tokenize, but we are going to leave the ledger to the person who's actually controlling the assets right to the custodian or the person who's holding the physical good. And this is because it's their core business and they bear the risk of a double spend. And so we can really trust them as a part of the, the sort of trusted infrastructure of the transaction to sort of protect that line and give them tools around it.

David Greely (22m 34s):
There's a way we do digital identity online now, and a lot of us might not have thought too deeply about it, but we do it every day. And then there's the way that we will be doing it in the future and I was hoping you could just kind of walk us through that very briefly, like how are we doing it now? How do you think we will be doing it in the future? And how does the ID++ that you have developed facilitate that transition?

Ian Forester (23m 01s):
The way that digital identity is done? Now, there's a couple of different protocols out there. Fundamentally it works through trust transfer mechanisms and, and these are similar to the trust transfer mechanisms that we are using to secure digital title. I think the difference between what we're doing with decentralized identities and what the sort of centralized identity providers are doing is that fundamentally, and this sounds like a small thing, but that DID, that serial number if you want to call it that, is globally resolvable. That means that no matter, no matter where in the world, that serial number will always resolve to the same person, right? The public key of that serial number will always resolve to the same private key holder and private key controller, right? And so this means that now instead of having a single golden record that must be maintained by a single entity who forms sort of a choke point in all transactions, they always need a call home before they will authorize any action.

Ian Forester (24m 08s):
Well, now you have this sort of globally distributed register that can be built in an emergent fashion, right? Where I deal with you and now I have a record of your DID attached to your identity, and I have a record that this is Dave's identity, this is Dave's serial number. So now when I send you a transaction to sign, I only need to look up in my own records because I can trust that that ID hasn't changed hands, right? You are still going to be the controller of the private key, and that sounds like a small thing, small, but it's one of these like really powerful foundational nuggets that then opens up a whole lot of second, third, and fourth order effects that we're eager to, to get in and explore in the market.

David Greely (24m 52s):
And is that what the ID++ protocol enables?

Ian Forester (24m 57s):
Yeah, exactly. The ID++ protocol is really an implementation of the WC3 standards around digital identity, decentralized identity, as well as using verifiable credentials and private data stores. So it's a sort of a combination of a bunch of different standards implemented as a library that we can then build a service layer on top of and use that service layer for various platforms in the market to again, sort of go beyond digitization where you are sort of locked into a single domain or ecosystem and really have trusted instructions that can move between different ecosystems on this standard.

David Greely (25m 40s):
And I want to come back to the privacy piece. And I know, Josh, you have stated that one of the important features of your approach is that it provides privacy, but not necessarily anonymity and I was just wondering if you could explain the difference and why it's important In commercial transactions,

Josh Crumb (25m 59s):
We tend to think about privacy on the internet in particular as this some sort of, you know, right, to be anonymous, right? So internet privacy has a lot of times been kind of associated with that. It's the old meme that I think came out, which I am going to use again, the cartoon in the early mid-nineties or whatever on the internet, no one knows you are a dog, right? So that's kind of the concept of anonymity and privacy on the internet. But when we are talking about financial transactions you know, you want privacy and proprietary trades and ability, ability to do things that's not giving away your commercial strategies and so you want a level of privacy, but that's not anonymity, right? You have to know who your counterparty is getting back to. We were talking about before about the foundational principle is the signature on the contract, you putting your skin in the game and your reputation that you are going to make good on whatever obligations you've signed to all of your reps and warranties.

Josh Crumb (26m 57s):
So ultimately you need to know who the other signer is. Anonymity does not make a lot of sense in that counterparty bilateral transaction, right? We want a level of privacy that the entire internet can't see what happened, just like you might be signing that commercial contract behind closed doors and not disclosing it to the entire world. So privacy and anonymity is very different in this context. And I feel like we have been overly focused on, you know, maybe some of the cipher punk ethos was looking for that internet level of anonymity and privacy. That's just not what we're trying to solve for in financial markets. And so privacy is still key. You don't want big central parties or your competitors, you don't want anybody sort of looking at your commercial transactions and your strategies, but it's not anonymity. We got to figure out how do we solve that hard problem of having absolute certainty who is on the other end of the line, but at the same time that's the only person on the other end of the line that can actually see this.

Ian Forester (27m 56s):
I just want to add onto that because I think anonymity or the demand for anonymity was a perfectly reasonable response to the, the sort of the perfect surveillance of the state of the internet, especially for the last 20, 25 years. When you are sort of in the midst of a Panopticon and everyone can see everything you are doing or, or at least certain very powerful parties can see everything you are doing the only option is really to be anonymous. I think where our aims with ID++ are to provide a safe space around the user where they can have their own little piece of the internet, their own little station, their own outpost that is protected, that is sort of their own cloister from which to operate and the idea the plan is for this sort of operating base to allow them the right to be known or the right to not be known and by giving the user that choice, we can now sort of make the demand for, hey, you need to be known for this transaction. Without that choice, the demand doesn't make sense. The requirement can't truly be met, right? So sort of by providing that gradient, we can enable transactions to have a higher resolution of steps and outputs and ensure that privacy between those

parties can be kept and sort of mirror the way that we build trust in the real world online and in digital systems, which hasn't really been possible before.

David Greely (29m 33s):
And Josh, you have talked a number of times in this conversation about the fundamental need in commercial transactions to have that legal finality and that many of the other tokenization efforts are kind of focused on the ledger. While you have been focused on the legal finality piece, you talk with a lot of people in the space, you talk with a lot of folks in the investment community, the asset management industry. When you bring up this distinction of the ledger versus the law in tokenization efforts, what's the response you are getting?

Josh Crumb (30m 08s):
Very frankly, a lot of light bulbs go off. I think I actually had one prominent institutional fund working on this for a long time, kind of actually do like the head slap. A lot of people are trying to bolt on the real world asset bridges from the ledger reconciliation systems of Bitcoin or Ethereum or so forth. I think people realized that maybe they were, ultimately they're all trying to solve that problem, right? But I think they were just taking a little bit different approach, putting other things in aspects in front of the other. We like to say for a complete proper decentralization, we kind of look at this triangle. The ledger has to be decentralized, the identity has to be decentralized, and the privacy mechanisms kind of what Ian was just talking about, that also has to be decentralized or user's choice.

Josh Crumb (30m 55s):
But the problem is all of our bolt-on solutions so far around taking the fundamental technology of distributed ledgers or decentralized ledgers, we have ultimately ended up centralizing the other two points of the triangle to try to make that work. So we have permission. Blockchains obviously highly centralized the identity piece, that's kind of the piece that the most people default to. And it's not like a lot of people are working on decentralized identity. Most of these blockchain initiatives use the W3C standards for verifiable credentials and decentralized identity. They are not particularly simple business models and they're not, other than selling tokens, that seems to be the only, you know, business model that a lot of the decentralized identity businesses have approached. And we are not sure if that token ones makes a lot of sense. So that's been one problem. But also just the libraries and working with these are not simple compared to all of the tooling that's been built for OIDC and you know, other sort of login standards, your login with Google or these types of things.

Josh Crumb (31m 56s):
So it's not simple to work with. So most of the time we get, yeah, we thought about decentralized identity and we will get to that, we will get to that later. So a lot of the work has been focused on the ledger and not focused on identity. And we just took the business approach that, hey, there's lots of people working on ledgers at this point, billions and billions of dollars. But if we put identity first, that's where we want to put our focus because we think the ledger ultimately gets commoditized in some way. And then of course, the privacy piece as well. So for true anti-fragile sort of decentralization, all three of those points need to have end user choice and it can't be reliant on just defaulting back to centralization.

David Greely (32m 35s):
Well, I want to thank you both for this introduction to some of these big issues and asset tokenization. It's been great to have both of you here to set the stage for the conversations we are going to be having throughout the rest of this podcast series. And Ian, you are going to be back next week to take us a little bit more deeply through some of these issues in identity, in signatures, in making sure that the digital signature maps to the right person so that we can have real institutional grade tokenization efforts and transactions. So with that, I think I will give the last word to Josh before we go and I wanted to ask you this question, Josh, in the spirit of Larry Fink's comments this week, you often refer to the technology you are building as not the thing, but the thing that leads to the thing. And so I was curious at this stage, what is the thing you are most focused on building, and what is the thing that that will lead to next?

Josh Crumb (33m 31s):
Yeah, you are kind of giving away the long-term prize here, but I know ultimately, again, I think the foundation of, of everything's, we are not going to reverse this path of digitization, right? We are not going to reverse this path in my view of things that are happening in artificial intelligence and, you know, machine learning, and we are not going to reverse this path to people wanting more transparent financial markets, more open access, more democratization. All of those trends are continuous in our view as we build bigger information highways. And so ultimately, identity is going to be the key to all of these things. Like how do you know who you are

talking to is not a robot or a bot, even with GPT two or whatever system even before it became popular, clearly passed the Turing test, right? You know, where, where it's going to be very hard to know if you are just talking to an AI on the other side of the line.

Josh Crumb (34m 26s):
And so that has all sorts of aspects, all sorts of impacts in our business transactions, in our political lives, in the type of content we consume, knowing on who's on the other side of the line of these technologies, that's an identity problem and a privacy problem. And we think that that's just the biggest problem to work on. Frankly, it's kind of the foundation of every other problem. We are trying to deal with content and AI and financial trust and institutional trust. So that is the big one. It's not a simple one, which is why everyone's not doing it, but that's ultimately the mission. And of course, abstract sense, it's a massive mission, but we like to take little bite-size pieces of it, solve the problems that are somewhat in your control with that end goal in mind. So that's why we are focusing on things like moving a money market in real time with a clearinghouse, which again, we think is fundamentally an identity in digital signature problem. So focus on that problem we can tackle. But if you tackle that in a very trusted and high stakes environment, you can start spreading those systems into other environments. So that's the big mission and, and that's why Id plus, plus and identity was always the core of Abaxx. All these markets, all of these things are what gets us there.

David Greely (35m 40s):
Thanks again to Josh Crumb and Ian Forester, CEO and Head of Product at Abaxx Technologies. We hope you enjoyed the episode. We will be back next week with another episode of *Re-engineering Tokenization*. We hope you will join us.

Announcer (35m 56s):
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