

Tokenisation_ an engine for convergence

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You're listening to the OMFIF podcast, the show that explores the latest insights and discussions on Global Finance, Economics and Policy. For people who love staying informed about the rapidly evolving landscape of the financial world. Join us as we break down complex topics, interview key thought leaders and provide essential insights to keep you informed about the evolving world of finance. Hello and welcome to the OMFIF podcast. My name is Lewis McClellan. I'm the editor of the digital monetary Institute here at OMFIF, and today I'm delighted to be joined by Richard Brown, the CTO of r3 Richard, great to have you with us. Can you tell a little bit about yourself please? Yeah, hi, Louis. Thanks for having me on so yeah, I'm Richard Brown, chief technology and product officer. Actually, at all three. My role changed a few weeks ago, and I guess the reasons for that may emerge as we work through some of the questions on this podcast. But yeah, I've been at all three pretty much since the beginning, and led the team that designed and brought to market corda, which is, By most estimates, the world's most widely deployed permission blockchain platform used by dozens and dozens of live production networks around the world. So I led the team that designed that, and I'm delighted now to get to not only directly the technology of it, but also what we do from a product perspective as well. So I'm looking forward to our conversation. Fantastic. Great to have you. And, yeah, our three very well known name, I think, for those involved in tokenization with permission blockchains and looking at the future of finance, can you tell us a little bit, a little bit more about our three you mentioned, you know, you've been there since the more or less the beginning. When was that? And can you tell us a little bit about the the future for finance that you guys are are working towards? Yeah, so we came to prominence in 2015



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so this is our 10 year anniversary, and it November will also be the 10th anniversary of when the first line of code of corda was written. So it's something that that is both close to my heart, but also very much on my mind, because if we look back to 2015 that was also the year that the Ethereum network launched. So if we look at almost like the big two of the original programmable blockchain platforms, the permissionless one in the case of Ethereum, and the permissioned one in the case of corda, we can both trace important anniversaries, back to that time, and here we are, 10 years later. And if we talk about what our three is today, I guess we probably call ourselves the leader in the tokenization of real world assets on permission chains. You look across the live networks, we have billions of dollars of assets deployed across all various customer networks, the Swiss stock exchange, the six digital exchange, is built on quarter. Euroclear is decentralized. Financial market infrastructure is multiple startups solving specific problems in financial markets are all building and have built on quarter. So I kind of see us as a leader in the tokenization of real world assets, starting on the tradfi side. So bringing tradfi to the world of tokenization. We also are a leader in digital currencies. We pretty much pioneered the concept of central bank digital currency, and have some large projects around

the world delivering that. And then the final thing we focus on is interoperability, as we might get onto that's a unique challenge and perhaps a unique problem to solve in the permission space, because unlike in the permissionless world, where there's typically a small number of very large, multi use networks, the permissioned ecosystem has evolved separately and differently, where each of these networks is typically more isolated, and so we really have to work hard to make sure they interoperate. In terms of our vision, it's very similar to what we started out with, which was, if we look at what the permissionless blockchain platforms have achieved, this idea of bringing entire networks of participants who want to transact with each other to a point of common consensus about which assets exist, who owns them, what the rules are for transacting them, and to do that at a large, huge, cross firm, cross jurisdictional scale. That's what we're aspiring to do, but focusing on the on starting, focusing, at least starting with the traditional, regulated financial markets, and bringing that potential, bringing that opportunity to them. So imagine a future where individuals and institutions can truly transact in a trusted and an advanced way, confidently and securely.



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Very exciting indeed. All right, well, a lot in there. We'll unpack some of that. But you mentioned tokenizing RWA, tokenizing real world assets as something that our three has had a big role in. That's a topic that you know, we've certainly talked a lot about OMFIF lately. And generally, there seems to be not, not an entirely new concept, but it seems to have a lot of momentum at the moment. Can you talk a little bit about our three's role in that? What you're doing that's maybe different from the way others are approaching it? Yeah. So maybe, I mean, I'm always warned by our team not to get into sort of pedantry and definitions, so I won't try and advance a sort of a.



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Definition of tokenization. But I think we do have to distinguish it from what has gone before. Because, you know, if we look at, you look at the major major, say this, major securities depositories, or, you know, the major major financial markets institutions across the world. You know, they digitized decades ago. You know, the move from from paper records happened in the 60s and 70s, you know, it was a major achievement of the traditional IT sector. So digitization has already happened. But if we, but if we look at how that was achieved, it was with one or two notable exceptions. You know, all done at the level of the firm, individual securities depositories, individual exchanges, individual banks adopted technology to optimize and improve like how they manage their books and records. So you look at a given look at a particular central securities depository, they've got their courses similar, manages and keeps track of the assets that they're custody and they're responsible for and who owns them. That digitalization problem has been solved. But of course, these firms are running different technology. They're not fully integrated with each other or or even with other parts of the market, necessarily, and it's very hard to imagine scenarios where they all work together, or where it's possible to take an asset issued in one place and move it to a completely different place, or to transact one asset against another in a seamless way. But if we look at what the permissionless world has achieved, they've shown a path to doing that which is based on these open, large, shared networks, neutral networks with that where you don't require permission to connect or transact. And they've shown that different entities, possibly competitors or maybe adversaries, can use that common substrate to to issue or record the existence of assets,

whether it's a crypto asset or or digital representation of a real world asset. They've shown how to how that can be done. And in a way, you can imagine, it's almost like it's projecting these, the these records from what were previously private systems onto the these public, shared systems that then allows transactions to happen far more, far more effectively, possibly at lower cost, and allows transactions that were previously impossible to be contemplated and so. So for me, this idea of tokenization is is partly the projection of the books and records out of individual systems and individual entities onto a shared substrate. But it's also doing it in a way that's highly standardized, highly composable, highly interoperable, so that we can, we can almost imagine, you know, what we're regulated equivalent of these permissions networks potentially look like, Yeah, can I jump in there?



07:21

Very, very valuable indeed. I'm gonna give you the opportunity to go into the definitions that you've been warned not to a little bit you've referred to permissionless and permissioned and private and public a couple of times. Can you just go into that in a little bit of detail and talk about where our three sits and how that kind of differentiates our three from from other DLT offerings like Ethereum, etc, yeah, sure. So maybe, maybe that's a good time to go back 10 years and sort of replay some of the thought process we had then. So we as all three began, we're not now, we're now, we're now. We're now a commercial firm, but we began as a consortium of dozens and dozens of financial institutions. And the thing that united us, you know, the reason why we all came together and why all three was it was, if you like, you know, put in this position, was we wanted to figure out, how could we apply some of the the exciting opportunities, how could we capture some of the exciting opportunities that networks like Ethereum or Bitcoin before it had shown more possible, but we had a big strength, but also a constraint. So the strength was, this was the world's existing financial system, where there are trillions of dollars of assets being transacted. This is the heart of the global economy. So it was, it was, if you like, the real economy, figuring out how to use this technology. But there was also a constraint or a problem, which was, although we could see the future, we could see this idea of, like, large, open, shared, neutral networks. There was no way to use them at that point, and that was for several reasons. One was they were permissionless in every way. And by patient permissionless, I mean anybody could connect, anybody could transact, and therefore with them, because there was no identity layer, you had no idea with whom you were transacting. So that just wasn't it was just so hard to imagine how that could be made compatible with, you're just, you're just basic regulations like KYC, that was also, it was also permissionless in the sense of, like, who was that? Who was actually confirming the transactions? And how did you know? So back then, the big, the big debate, or the big problem, was transactions were not even confirmed with any kind of determinism that the Bitcoin model would you know, which persists to today is based on probability. So you get to a point where you're very, very sure there's a high probability that your transaction won't be reversed. But that probability is not zero. Try explaining that to, you know, the boss of a CSD who has to explain and demonstrate how they're compliant with them. You know, the CSDR regulations in Europe. So that idea of probabilistic finality wasn't acceptable, and those networks were completely open, and there was no there was no privacy. So so we had this kind of dilemma, which was, these, these open, shared networks, are clearly the future. They're clearly going to give so many benefits that we can't get when you're completely isolated and separated, but we can't use them because there's at that point, because of all the reasons I just described.



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Right? So we said, Well, there's two things we could do. One is we just throw our hands up in despair and say, well, let's just wait. Let's do nothing until those networks can be used. But because we didn't do that, what we said was, well, there's a lot we can do. Nevertheless, we can be inspired by those technologies. But we can, we can, in effect, you know, take the ideas and build something that captures as many of the insights and hopefully captures as many of the benefits, but which doesn't have the things that would otherwise make it impossible to use. And that was really the genesis of corda is, you know, can we build it? Can we build a platform that allows regulated institutions to build networks between themselves, that allows them to back to my previous point of project, parts of their books and records represent the existence of real world assets or trades or deals or whatever it is transacting safety, with identity, with transaction finality, with privacy. Can we do that? And it was probably a mistake, because it's it's set up and as versus them, and it wasn't the intent, but we described it as as either either private networks or permission networks, private in the idea of trying to signal privacy, and also that the only people on that network were people you knew and permissioned, in the sense that the people who were confirming the transactions were known, and therefore, you know, you knew who to sue if something went wrong. But of course, he had the potentially downside of, as I say, positioning us as a nurse versus them, when, in reality, it wasn't. It was it wasn't, it was, it was a wholehearted and sort of like, you know, honest attempt to make as much progress as we possibly could, whilst, whilst knowing we couldn't use the the existing public technologies. But it did create an us versus them, which is regret. But hopefully that gives an indication of why we why we've had to take the path we did. But also, and then maybe my final point on this is what we learned along the way, which I think is probably the absolute key to what happens next, is the choice of technology is just one small part of it, because to get, just to get any one of those customers that are on the all three networks live, you also have to do things like integrate with existing systems. You've got to build a business model. You've got to figure out, how am I the the operator one of these networks going to sell it to my customers, you have to get the right legal opinions, you have to get the right regulatory approvals, and all those things are necessary, irrespective of the technology. And so by starting when we did that's all done there, we've got 25 plus of these live networks, all of whom have done that. They've got a business model, legal opinion, customers, a brand reputation, all those things. That's all done, whereas had we waited for the public networks to become ready, that work would all lie ahead of us. I guess we'll get onto food in a bit, but that's that's a key part of my thinking about where we take the business.



12:33

Excellent, very exciting. So talking about tokenized real world assets, and you know, you've kind of laid out a case for the value that they provide, as opposed to the current, digitized, rather than tokenized system, Standard Chartered, I think projects that the market for tokenized real world assets will exceed 30 trillion by 2032



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Can you talk a little bit about what that trajectory looks like? What's driving the demand for these and how that's going to evolve? Yeah, I think there's a few things going on. So one way to look at it might be to start with the, if you like, the the two separate worlds, tradfi, traditional finance and a defy decentralized finance. Start with, start by looking at the the dynamics in

each of those two separate networks. And then I'll make a case or an argument that I think those two worlds are coming together, and the problems of one are the advantages of one can be the solution to the problems of the other, and vice versa. So I look at traditional finance first by going down this tokenization path in the way I've just described. You know, we've managed to help several of the world's largest CSDs and exchanges modernize and move to a point where assets can move far more freely settle intraday. Look at HQ lax, which is one of the one of the innovators building on our networks. They allow baskets of government bonds that sit in a CSD to be projected onto their blockchain, onto their quarter network, and then these baskets of bonds can be settled and traded between banks on a real time basis, settled in real time intraday. So they're getting real benefits today, and it's starting that journey of moving from these digital records to these tokenized records. So that's growing, and I think as we begin to connect those networks, we'll see it grow even further. But if I was to summarize like how much value is on those networks, it's in the low 10s of billions. Now, of course, that, or at least not of course, but that low 10s of billions is actually significantly more than the amount of real world assets deployed to public networks. I'll make that case in a moment. But so and therefore all that stuff I talked about, about how important it is to do the integration and the legals and the compliance that explains, as well as the technology explains why they've been able to achieve that. But of course, 10s of billions, compared to the trillions of asset dollars of assets that exist in the tradfi world, it's barely a drop in the ocean. And so that Standard Chartered number that you quote that says in the market for tokenized owas may exceed 30 trillion in the next 10 years. What that's really saying?



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Is that drip of tokenization that has happened on the tradfi side so far, within 10 years, everything will have been because 30 trillion is it was close to all assets in the world. So, so we've started the journey there, but we need to massively accelerate it. If I then look on the defi side, it's kind of a different situation. So, so we've got insane product market fit in various areas on these public networks. I'm sure many of your listeners will be intimately familiar with with defi itself from a few years ago, which I define as that, that just explosion of creativity a few years ago when all these really interesting on chain contracts were deployed, first to Ethereum and then elsewhere, that were able to interoperate with each other. Assets could go from one then to the other. They could compose this. We could see the outline of a new financial system enabled by on chain business logic that could talk to other examples of itself. So, so we saw that, and then we saw perhaps the next big example of insane product market fit that the public networks have, which is the emergence of stable coins. So, you know, usdt, USDC, you know, we're seeing huge growth there. But if we then look at like the next obvious thing, which is because stable coins are, if you like, the first with the first tentative step towards bringing real world, real world value onto these public networks. Previously, it was just, you know, crypto assets that were being traded, stable coins brought representations of real value. You look at where the the end game could be, or where we're going is, well, why just representations of cash? Why not? Why not interest bearing accounts, which is, yield coins, which is, is, is probably, probably the next wave. But in reality, why not every asset? Why couldn't every asset be represented? And the answer is, and of course, under this there's, there's the question about demand, which is, well, that's where there's a huge number of investors, both retail and increasingly institutional investors. So there's clearly demand there, but there's a problem, and I think this is where the two worlds come together, which is, is the point I made earlier, which is just because there's demand for high quality assets, high quality real world assets to invest in, it doesn't mean the supply is easy, because you've got to integrate with existing systems. You've got to extract them from the existing systems, project

them onto the blockchain. You've got to solve the reg problem, the compliance problem, the business model problem, and all those things. And so if you zoom out, you think you see, okay, well, the supply is on tradfi. That's where those \$30 trillion of exist, \$30 trillion worth of assets exist, and the corda networks have figured out how to, how to access that supply and how to progressively move it on chain. The the increased, or, if you like, the new source of demand, however, is on the public side. You know, that's where there's this hunger for high quality assets. And so it kind of feels like there's, there's like, there's an opportunity to a win win trade, if you like, which is to help bring these two worlds together, so that for those for whom it's the right thing to do, assets that were originated on the tradfi side could flow with the appropriate controls to where the demand is, which is on the public side. So I think Standard Chartered, I think they're being optimistic there, but the thing I've learned over the last 10 years is things always take longer than you expect. So maybe not by 2032 but I think that the implied statement they're making there, which is all assets will eventually be tokenized. I think that's arguably going to be the case.



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Excellent. All right, yeah, it does seem like, it seems like often, in this case, we underestimate the sort of long term potential, but also how long it's going to take to get there. Kelly, yeah,



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you've mentioned, yeah. So you've mentioned quarter, sort of solving a lot of the existing challenges for real world asset are there? Can you go into a little bit more depth of what those challenges are? How are threes addressing them, and if there's any still remaining, I guess. Yeah. So maybe, just, maybe, just maybe we just drill into one to start with. So



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I think when people first come into this space, or they first look at it, they they, they think that the only problem to be solved is, is one of, if you like representation, one of saying, Well, you know, rather than representing the existence and ownership of an asset in a legacy mainframe or an existing database, rather than representing it that way, then we'll represent it in quotes on the blockchain. And that's clearly true in part, because that is what we're doing. We're taking these, these, like these historical legacy representations, and moving them to this to it to be like a shared higher quality, high fidelity representation, whether that's on corda or a fully permissionless chain. So that has to happen. But I think the thing people miss is that's necessary, but not sufficient, because what you also have to do, of course, is manage the workflows, the business processes that sit around that. So who needs to approve that when that asset has moved, when it representation has moved from one system to another, well, what do you do when? When something happens, there's a corporate action, the borrower defaults. You know, loan is repaid. How is that information conveyed? You know, which, which of that information do you convey all the way onto the chain, and which? Counter intuitively, do you decide not to? Do you decide not to because it would over complicate things, and you keep it on the on the traditional side, so that.



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Question about how the workflows occur and how the permissions and the approvals are done, how the data is the like, the metadata, the corporate actions data and so forth, is is flown. That also has to be solved, and that that's a real sweet spot, certainly for quarter, because one of quarters, if you like, sort of like superpowers, is, is it it real focus on inter firm workflow, this idea of managing the process and the communication flows between parties,



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indeed, you know, it's sometimes I look at what the public chains have achieved and what Cordray has achieved. And I think the reason why this space for both is because they really optimize for different things. You know, the public chains have really, have really shown us, how have you really simplify and standard? And really simplify and standardize things like using ERC 20, you know, a definition, a very simple definition for tokens. If you standardize and simplify, you can achieve a lot, because everybody can just align to that same standard. But you also need the complexity to live somewhere, because you because some of that is just irreducible, and that complexity that backwards and forwards between the participants, the workflow, the and the management of that that also has to exist somewhere, and we probably shouldn't pollute the public networks with that. That should probably stay as close to source as possible. And that's where, that's where COVID excels. So so you can kind of like, if you the future is always unclear, but if you sort of like, look between the as the clouds begin to part, and the fog clears, you can sort of see the sweet spots for these different technologies and how they could work together. That's interesting. Talking about these technologies working together. Can you talk a little bit more about about that, like what they're each contributing potentially? And yeah, if this is not so much an alternative, but something that is actually going to combine, are we? Are we seeing that? Yeah. What does that look like? Yeah. So, I mean one, one example would be, let's take HQ lax, so HPL x is, is a quarter customer. So, so here the the technologies being combined are the the existing custody system actually in Clearstream, one of the two huge iclds, the existing custody system, or, you know, the Depository system in Clearstream, and the new HQ lax system that allows banks primarily to define it and manage baskets of bonds. It's interesting looking at the split of responsibilities between those two platforms. So, so things like corporate actions and interest calculations, all this, all this, all the bond math, I guess, as you call it, all of that pretty much still lives in Clear Stream, because it's already been coded and and it just has to happen in one place. Whereas what's moved to the, if you like, the more modern platforms, to the quarter based HQ, Alex platform, it's the, it's just that, that that which is necessary to facilitate real time, intraday settlement and to make it very possible for the participants, the the the buyer and the seller, to find each other and and conclude the deal. And so it's, I guess, the and the lesson I'm taking from that, and I guess the the Insight I'm trying to trying to convey is the goal is not to take everything that exists in traditional finance, all that complexity, all that richness, and just rebuild it and re implement it on a permissionless chain in the end state. You know, what would be the point? We just be polluting, polluting the new world with all the complexity of the past, instead the the, I think the thing that would be the real win is we identify, almost like, what's the irreducible core? What is the piece that we need to move to the public chain to give visibility to allow the transactions to occur and allow new types of deals to be done? What is just that piece that needs to move? Which I think is the definition of the asset, the ownership and the rules around who can own it, or how it can be fractionalized, but keep the rest of the complexity where it is. So you end up with, you don't end up with all the business logic moving, you just end up with the key pieces that facilitate these new types of trades, moving, and everything else stays where it is. So I

guess time will tell, but I think that's possibly a good example. Yeah, it's an interesting one. I think you can kind of see a similar case in payments. We look at cross border payments, and if that's arranged on with stable coins, in normal payment systems, there's a lot of other information that is sent alongside that, who it's from, and that sort of thing for AML requirements. But with Blockchain based payments, you don't want all that information going onto the blockchain. You want that sent separately in another messaging system. So I suppose, yeah, this idea of keeping what is actually being transferred on the blockchain to be as thin a layer as possible is something that we're seeing in a few different areas. I think so. And maybe just one other thing on the I guess this is the engineer or computer scientist in me, which is



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a lot of the huge amount of the value of the defi and the public networks are offering is this idea of everything in one place. So rather than there being one network for one type of asset and a different network for a different type of asset, you look at the public Ethereum or Solana or Cardano network, whatever it is, there are multiple different types of asset and use case all living in the same place.



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Place, which is great, but there's, there's always going to be a natural limit. So some chains are highly, more highly performant than others. Some transactions can do more transactions per second than the others, but at some point you will reach a limit, and then, and then, the only way to solve that is with things like, you know, layer twos, or partitioning and, and, and there's always a danger then that, you know, you get back to the problems of the past, or siloing and inconsistent data one, really, in addition to choosing the right layer one, choosing a high performance, low latency, high quality layer one, which clearly would give us a huge amount of runway for these kinds of ideas. The other thing is, is to say, Well, only have that layer one do the absolute necessary work, and anything that isn't necessary, do it somewhere else and so and of course, the less you do, the more headroom you've got, the more transactions you can do, rather than the more complexities that's cluttering up the blocks. In effect,



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can you expand on that a little bit? You mentioned the layer twos and the other kind of solutions that you know, the permissionless networks use for, I guess, to kind of apply the relevant permission. And can you talk a little bit about those and how they compare to, to the r3 the quarter model as well?



26:11

Yeah. So I guess for listeners, the starting point is compared to things. So you take a take the take the quarter design quarters haven't gone into this, but it's probably necessary for this answer quarters, quarter is very much based on a point to point. Need to Know model so, so you could ultimately have arbitrarily large quarter networks doing lots of things and and it

would scale because it would go as, if you like, as it's not, not everybody has to see everything, and not everybody has to process. Has to process everything, and therefore you and me deciding to do more trades doesn't impose an obligation on somebody else to upgrade their system. And so it can naturally scale, however, for, I think, for probably good business model and regulatory reasons, it turns out that each quarter network today is actually quite separate. So, so that performance advantage isn't something that many of our customers actually are not. They're not pushing the boundaries yet. Two or three of them are, but, but the rest aren't. And so there's still a lot of headroom. And as they come together, that should be good, but, but that, but that model doesn't work in the in the permissionless space. So this idea, when I say permissionless, you know, I'm really thinking here about these, these open, shared networks that are neutral. Anyone can use them, the security analysis of those networks for them to work. Ultimately, you work through all the details, and what you conclude is you need a large number of participants validating and processing every transaction. And therefore, as if you and I decide to do more transactions that imposes a cost on all those validators. That's why those networks charge things like gas or transaction fees. If you're going to impose a cost on someone, then you need to pay for it. So do you then end up with this, this dynamic which is different, these different layer one networks, these different public networks, there's simply a limit on how many transactions per second they can process, or how much data they can process. Now, it turns out some of them are, are massively more scalable, massively more performant than others, to the extent that they they're not going to hit these performance problems for a long time, but theoretically they're still there and on the be like, you know, the granddaddy of these, of these public networks, Ethereum, you know, they've hit that limit some time ago. And so the question is, well, if we can only process so many transactions per second on, say, something like Ethereum, and yet, there's still demand. What do we do? And the approach that that community has taken, which is entirely legitimate, but it does have some downsides as well, the approach that community has taken is to say, well, you know, let's, let's identify some situations where, where we in effect, you know, take all the business logic. Take all the transactions off chain. We'll move them somewhere else for a bit. We'll move them to a layer two. We'll do a lot of the transactions there, because perhaps it's just a bit of backwards and forwards, or maybe there's, like, there's, there's just a lot of other stuff happening. And then periodically, we'll net it down and say, What was the net effect of all that? And then we'll update the layer one. So it's elegant, technically, and, you know, and it self evidently, works, but it also creates some siloing, because if you and I have decided to use a particular layer two, but some other people have chosen to use a different one, then the only way we can sort of transact with each other is to then go back via the layer one. And it's all doable, but there's a cognitive load, and it gets a bit it gets a bit complex, and so and so. I'm not saying that it's good or bad. It's just, just a natural artifact, I think, of of a successful platform, the more successful you are, more people want to use it, and at some point you hit a limit. And therefore, you know, as I'm thinking about, how do I, how do I allow these, these quarter networks, to transact with each other, but also to transact with these public networks? You've got to be very careful about, you know, which public networks you work with first, which ones you choose because you want ones ultimately that are high performance and highly scalable, so that you don't have to hit this layer two problem for the foreseeable future. I see, okay, very interesting. And so we've talked a little bit so far about this idea of some convergence and collaboration between public and permission networks. Can you talk a little bit more about.



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What that means, and if that implies that we might see traditional finance actors moving more into crypto, getting more comfortable with with the assets on the on the public and

permissionless networks. Yeah, so I hinted. I hinted at this a bit earlier, so maybe I'll expand on that. So, so first thing I'm not I'm not saying that. I expect traditional finance firms to, as you say, in your ways, to get comfortable with crypto, or to start having a bunch of Trump coins on their balance sheets. You know, that's not what I'm saying. It's not what I'm expecting. Although you know, anything's possible these days, but I do think what could happen is if we begin to, if we, if we continue to see this increased demand on the public networks for this almost like this insatiable demand to buy, trade, invest, hold, high quality assets, whether it's stable coins initially, but you know, representations of real world assets in the future. If that demand grows, it's inevitable, I think, and entirely legitimate, that the supply side, which is the traditional finance sector, would want to help satisfy that demand, and we see some early examples of that. You know, the the Blackrock V, U, I, D, L, Biddle offering is quite interesting. And then there's, there's other firms active in this space, but, but the like the macro picture, that is dangerous, because things that seem obvious don't necessarily, not necessarily true, but it does seem obvious to me that that you've got, like I said earlier, you've got this, this growing demand on the public side for high quality assets that either allows, you know, investors on that side to have a hedge against crypto volatility, or just to have all their just have all their holdings in one place. You've got that growth on on that side, and then the supply, both in terms of, like, know, how expertise and sort of interesting, you know, just professionalism in terms of existing financial institutions, but also the supply of high quality assets that's in the traditional finance world. So, so tradify is clearly going to continue to satisfy and serve its existing clients, but it strikes me that there's, like, there's, there's an additional opportunity, some net new revenue opportunity for them on the defi side, which is to bridge that demand supply gap and make it possible for new owners of assets, their customers, to say, you know, what these assets that I currently own or I currently manage, I'd love them to be packaged up, tokenized in the right form, and in effect, you know, bridged across to defi so that they can be held by held by appropriate owners on the other side, it just feels like a new channel. You just to be completely generic about it, it's a new sales channel or a new a new customer class. Yeah, absolutely. And I think many in the crypto community are starting to realize what banks offer in terms of, you know, market making and those kinds of services and that sort of thing would be, would be sort of useful to give some maturity and depth to the to the crypto asset market and defi, defi sector as well. Yeah. Well, said exactly that,



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yeah, just on this convergence on public and permission networks. Can you talk a little bit about what each is contributing, and I guess, what each is benefiting as well. In a world where they're they're working together more closely. Yes, let's, let's take a I'm going to give an imaginary example now, because this is, this is future looking, and I can't speak for our customers, but let's imagine there was a an existing quarter called a permission network. So what does that look like? So that is a network that is managing the ownership, trading and maybe issuance and custody of some real world assets, bonds, stocks, whatever it might be. So that network has achieved that it's got the legal opinion, it's got the customers it we now have digitized, tokenized representations of real world assets sitting on the on this corner network, and then on the other side. Let's imagine that there is a collection of investors, a collection of, you know, whether it's retail or institutional crypto owners, who would like to buy those assets. They would like to hold them or use them in a pool, or whatever it is they might want to use it for. That we're making, making an assumption here, there is some demand here. Maybe they just want higher yield than they could get from a from a yielding stable coin. There's, I'm not going to make predictions about what that, what the composition of that demand is, but, but we know, but we can, we can,



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you know, normal portfolio construction by somebody might need, you know, a tokenized government bond. If all their infrastructure is tokenized, they might, you know, for normal reasons, one high quality assets, exactly that. So then, with my, my CTO hat on CTO and hat on with from a technology perspective, how can I? How can I help those two ecosystems serve each other's needs? And if I just look technically at how quarter works, a quarter network consists of a collection of nodes representing the legal entities, you know, the companies who are using that network. And then it and then it consists of something called the notary, which is the is the part of the network that the thing that is responsible for confirming the transactions, if it's our solution to that probabilistic finality problem I talked about earlier, we built it because we couldn't.



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Rely on public networks to confirm transactions with finality and so so that. So that's the thing that tells you when a trade has happened. The existence of the notary is why HQ AX can do real time settlement. Because once the notary assign the transaction, it's final, and the legal opinion and all the rest of it, and it backs off that. So the, you know, the thought experiment is okay, well, if I, if I, if I've got that notary whose job it is to look at a transaction, check it's legit, and sign it off to say it's good. Well, what if that notary simply ran on on the layer one blockchain, it simply ran on the on the public blockchain. You know, notary is just some business logic. Well, business logic can be implemented by a smart contract. So what if that, though, that hypothetical quarter network I talked about, what if, instead of running its own notary, it simply runs that as a smart contract on the public network. So now, when a transaction is finalized on the quarter network, and perhaps that transaction, this is, I guess, foreshadowing, what might happen. Imagine that transaction is to lock the asset immediately the layer one knows that that asset has been locked, and we know it's locked with finality. So then the next step would simply be to say that smart contract, well, okay, now it's locked on quarter. Let's issue it, as they say, an ERC 20 token directly on the layer one. So just by, just by moving the just the technical operation of how transactions are confirmed, to converge them technically like that, suddenly you've opened up a bridge from the permissioned world to the permissionless world. But clearly there's a lot more detail to go through to and, you know, I'm just talking as there's a degree of speculation in what I say there. But technically, you know, from a CTO perspective, that's entirely, entirely plausible, and it's, it's something that couldn't have been done several years ago because it required the the quarter ecosystem to to get these assets, to get lives, to get these customers, and it required the permissionless ecosystems to solve the problems of transaction finality, which they have. And it also then required what's happened, probably in the last few weeks and months, which is regulatory clarity to settle and to make it clearer that such things could be countenanced. Whereas even six months ago, the idea of bringing these types of worlds together at all would have been absolutely unthinkable.



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Very exciting times indeed. And yes, it's interesting to see how this converges with policy makers decisions on this. Obviously, we're seeing some political momentum for this to become

easier in the US, but still some some hurdles remaining, and I guess we'll see. You know, for banks operating, well, maybe this will be a solution to that, actually. So what I was going to say is that there are still some regulatory hurdles for banks interacting with public blockchains. Is what you're talking about, the if they're already comfortable with working with solutions like cordov, where the legal structures are more similar to what they're used to, is that kind of a way for them to be able to get into public, Blockchain based business,



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potentially, yeah, because the thing that from a long, long, painful experience in the IT industry is customers don't like being told that to achieve some objective they have to rewrite half of their existing work. And so that sunk cost problem is absolutely real, and legacy code is, in reality, a huge amount of of codified business knowledge and experience. And so So customers who have all existing traditional institutions who have solved that problem of how to tokenize assets and get them onto to a modern blockchain platform like corda, if in the future, there was the ability, where appropriate, for some of those assets then to flow naturally on to a public network. It's immensely valuable to them, because the alternative would be, well, what would the alternative be? They'd have to build something from scratch. It would just be, it just be a lot of pain, whereas this is this, this principle, this could just be just a simple extra step. So like I say, these are, these are directions the world could go in my main, my main objective at the moment is to, is to really, really understand and and be able to communicate, you know, the competing objectives and problems of the public and private world, but, yeah, it's a super exciting time,



39:06

all right. Well, it's all very interesting, a very dynamic time. As we were saying, we're running out of time for this podcast, although it's much, much more to discuss. I'm sure in the future. Can we? Yeah, where can people find out more? If they if they want to hear more about this from you, Richard, you might you find me on Twitter as gendl, G, E, N, D, A, I, middle name, but for anything we've covered here, probably the best place to go is the r3 website, which is R three.com head over to the blogs and you'll see a ton of writing I've done on this. Yeah. Thank you. Terrific. All right. Well, thanks very much, Richard. It's been great to have you here. Likewise, thanks, Lewis. And for all our listeners, make sure you check out Richard's blog on the on the r3 website, there's some very interesting stuff there, as there is on on Fifth org, where we've got the our own commentaries and details of upcoming reports and events.



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And the most notable of these is the digital money Summit, which is on May 21 and 22nd so hope to see you there, and make sure you join us next time. Thanks for listening. Goodbye. Thank you for joining us for this edition of the OMFIF podcast. If you found today's conversation engaging, make sure to stay tuned for additional thought provoking discussions on artificial intelligence, Central Bank, digital currencies and digitalization of finance, by subscribing to our channel, stay connected of the latest developments by following us on our LinkedIn page. OMFIF, digital monetary Institute.

