POD OF JAKE
#161 - DAVID SCHWARTZ
AI-GENERATED TRANSCRIPT

Jake 00:16
Thank you, David, for coming on to join me on the podcast today. I really appreciate you taking the time. You are the CTO of ripple. And one of the original architects of the XRP. Ledger, you've been there for 12 years now working in the ecosystem. So definitely one of the OGS in crypto and even working, sort of prior to ripple and you know, crypto related fields and everything like that had an old patent and everything like that. So looking forward to diving into a lot of this. But I think before we really dig in, it would be great just to hear your story from as early as you were willing to start to where you are today and some of the decisions you made along the way.

David Schwartz 00:52
Oh, thanks, Jake. It's great to be here. Yeah, I was I was incredibly curious about how the world works. As a kid I pocket calculators programmable pocket calculators are my favorite toys. And I followed their evolution into computers. My mom tells it tells a story. Once I was sitting outside a grocery store and someone walked up to her and said, Your assign is either really smart, or really dumb, which is like, Excuse me, what do you have, apparently, what I was doing was I was testing, there was a beam brake sensor that would open the doors. And I was putting my hand in the beam brake sensor. So the doors would open and then close, open and close. And I was doing it over and over again. And she noticed that I was doing it a little bit differently each time, I wasn't just repeating the same thing to watch the doors open. But I was sort of experimenting with the operating envelope of the door opener. And I'm sure people have heard stories about me taking doorknobs off, I just love screwdrivers and screws taking things apart. I later learned to put them back together again, which is you know, if you're a magician cuss on women and half is great, but being able to put them back together afterwards is important too. And then I moved into, you know, I had the early that early patent in distributed computing. And then I started working at companies that was that were doing, you know, software that involve distributed computing, encryption, secure messaging, Cloud Storage. And that was a pretty natural segue into into blockchain in 2011 or so.

Jake 02:16

Can you talk about why you went and got that early patent and distributed computing? Like what was the intention of what you were building there?

David Schwartz 02:24
Yeah, so this was a long time ago. And it seems crazy today. But the anticipation at the time was that more than Moore's the limit of the Moore's Law was going to break down fairly imminently. And so we weren't going to be able to keep making faster processors. And it's funny, because we always seem to think that Moore's law is going to break them. And hopefully, you've probably heard a lot of news lately about people saying that, well, they were definitely saying that back then, like they thought that they had already hit the wall, that quantum effects would make it impossible to make faster processes. So what I was thinking is like, imagine you're in, you're in an enterprise, where you have 200 computers in, in the building, all owned by the same company, and most of them are sitting idle at any particular time. So the idea was that you could use the computing power of the computers that were sitting idle. But what happened with the reality was that processors kept getting faster, and networks didn't really get that much faster until much later. So the world moved in the wrong direction for the pattern to be useful. But which is unfortunate, but it was still it was, you know, still interesting, it got me interested in distributed systems very early, and obviously, I continued to move in that same direction. Right?

Jake 03:28
So what were you doing when you first heard of Bitcoin? Not like in that exact moment, necessarily, but overall in life? What were you focused on? And then when did Bitcoin first sort of like really get your attention? How'd you discover it? And what was interesting about it, because I understand you spent a lot of time you know, very interested in Bitcoin and accumulating some bitcoin before realizing, hey, there's some problems here. And I think we can do something better.

David Schwartz 03:53
It was it was it was actually somewhat fortunate timing obviously, I wish I discovered Bitcoin earlier. Everybody who discovered it, no

matter when you discovered Bitcoin, everybody wishes they discovered it earlier. So it was 2011. For me, what had happened in my life was I was working for a software company in Santa Clara called webmaster, they had that name before it meant what it means today. Interestingly enough, they grabbed the domain webmaster.com, which turned out to be like their number one asset, it's kind of a funny story. But the company had basically just imploded the system due to some poor financial decisions that they've made. It's an interesting story, but probably not worth getting into here. And I was like, I can't really stay at this company anymore, because they're just not they're just not executing well and making a series of bad decisions. And so I was looking for something else to do. When I stumbled on Bitcoin, literally, there's a website called stumble upon where you tell it what you're interested in, it tells you what you should be interested in. And so of course, when I told that, that I was interested in cryptography and distributed systems and I come from a family with a very libertarian bent that I have a pretty libertarian bent myself and it's like, well, you bitcoin is like a 10 for 10 match on on your interest, and I immediately real I was like that was that that was that was like, definitely, you know, tell cryptographer that cryptography is gonna be like to eat the economy. And there's certainly like, who doesn't like money. But also like I always from my libertarian background, I kind of understood that information was a tool of control. You know, I watched the Berlin Wall come down and a big factor. And there was the people in East Berlin wanted the material things, you know, like blue jeans that people in West Berlin had. And that's it. It was information that had that political effect that was a tool of liberation. And I saw control over money as sort of like the neck of the next place where that could be that kind of liberation. And so Bitcoin really, really resonated with me. And I think it was, you know, it wasn't that long before the first cracks in the sort of proof of work narrative started to appear in particular. I know it sounds crazy today. But the early narrative was that like, everybody was mine. You know, like, if you had solar power somewhere, and you didn't want to sell it to the grid, you would just mined to make money. And it's ridiculously economically naive. I mean, obviously, they just said, Well, someone is going to have the cheapest power, someone's going to have the cheapest mining hardware, and they're going to put everyone else out of business. And we know now

that that that was very naive. And so I think it was very early, particularly, you know, to Jed McCaleb, myself and Arthur Britto started to realize that, contrary to what most people at the time were thinking, proof of work was not what was the amazing thing about Bitcoin? It was the fact that the Ledger was public. It was the fact that transactions were public, it was the fact that everybody could make sure that all the rules were enforced, like, there was no as the fact that were no administrative functions like that, how it happens to solve the double spend problem wasn't the secret sauce.

Jake 06:34
But if that wasn't the secret sauce, didn't you still need to find sort of a different an equally or better or more adequate solution to that problem?

David Schwartz 06:42
Yeah, and that seemed really hard at first. So there's two aspects to that problem. One of them is the initial distribution of the currency, like Bitcoin uses proof of work to do the distribution of its currency. We didn't come up with any substitute for that. And so all of the XRP and inception was just sitting in an account for anybody who wanted to take it. But the other problem at first, it did seem daunting, because like, everybody did think that proof of work was the secret sauce of Bitcoin. But what we quickly realized is that all you need is a global transaction order. All if it right, the only problem that you really everybody knows what transactions are valid, everybody knows which transactions are invalid, you don't need any consensus mechanism for that. But you do need a global transaction order. So if I'm, if I'm a jerk, and I have one Bitcoin, and I make one transaction to send that Bitcoin to Alice and one transaction to send that Bitcoin to Bob, we need to make sure that we eventually agree who gets the Bitcoin, Alice or Bob, otherwise, the system breaks down. And all you need to do that is to agree on which transaction comes first. And so we start as we started to sort of break the technical problem down, we realized all we needed was a global transaction ordering, and then transactions or numbers, so you can just sort them in order. So like imposing a global transaction ordering, and the first is just sort of transactions in order and apply them in order. But then the problem that you have is what if there's a transaction to Alice and a

transaction to Bob for the same Bitcoin and we all sort them in order in the one to Alice comes first. The problem is, there might also be a Bitcoin transaction sending that same Bitcoin to Charlie that only some people have seen. And that might sort first scenario, a problem that the people who have seen that transaction might not realize it comes to us. So it comes down to just a problem of agreeing what transactions have been seen. And it turns out that it's not that difficult to write an algorithm, people just say, we've seen this transaction. And that's basically what consensus does, it just facilitates the global ordering by literally agreeing on what transactions have been seen before a cut off, and which will be sort of deferred after the cut off. And I think the last thing that makes it not as hard as you might think, is that all you really have to do is either say let's execute this transaction right now, because we saw it before the cutoff, but let's just execute it in the next round. And that's enough to preserve consensus just either agree which transactions execute now in which to defer. So agree to agreeing to either execute now, or defer is literally all you need, you need one bit per transaction. And it's not that hard to write an algorithm to do that. So the problem kind of fell apart as we worked on it. Okay,

Jake 08:56
so basically, you guys looked at the proof of work as a solution to the double spend problem. And you said, this is not necessary. And there may be a better way to do this. And let's go build our own, you know, system or blockchain, and I think it was called, like new coin or something originally. Let's go see if we can sort of make like Bitcoin is awesome. But let's go see if we can make a better version. Right. At this time. It's like super early still, you mentioned you wish you had discovered earlier, I certainly would have been happy to discover it in 2011. But But you go and you start this new project, what was like, Can you can you bring people who are more like me, who came in you know, several years later, can you bring people back to like, what the landscape was like at that time? And there were other projects that were coming up, that were aiming to innovate in slightly, you know, in different ways. How did you sort of look at what Bitcoin was where it fell short in your view? You know, what you wanted to do differently and then what others were trying to do differently did any other projects out there were they intriguing at

all or exciting or basically you kind of liked Bitcoin but thought you can do Something a little better.

David Schwartz 10:02
I think initially, we thought that sort of all there was were was Bitcoin and exact clones of Bitcoin, that, you know, that made minor changes, they, you know, meme coins that were a long long list of meme coins that were essentially just cut and paste the Bitcoin software and change the name change the distribution algorithm changed the mining algorithm. So I've said, Well, you know, maybe mining algorithms that work best on CPUs might be more interesting mining algorithms that require memory or storage might be more interesting there was the innovation was happening within the very tight confines of basically all the systems were by today's standards, very, very Bitcoin like, and so we had the idea at first that that proof, the cracks and proof of work was starting to emerge that it wouldn't be this decentralizing back then it was very expensive, you know, millions of dollars a day. And so we thought, let's try a sort of distributed agreement algorithm. And it could be worse, like we didn't know, we didn't know ahead of time what the properties of that algorithm would be. But we just thought, Let's build it, see if it's technically possible, and then see what it's good for. And what we discovered after we built it is that it's really, really good for payments and for sort of a decentralized exchange, because you don't have a dictator who can order the transactions, you can keep the fees low, you know, the properties of the algorithm, are such that it's really suitable for sort of payments type of use cases, all at the same time, that sort of the next big project was Aetherium. You know, Stefan Thomas, who was CTO at the time, and myself spent some time with Vitalik, we were gonna hire him Funny story, new coin didn't exist for six months yet as a legal entity. And so we couldn't, we couldn't sponsor batalik come to the United States. It's such a shame, imagine the great things he could have done at ripple. That's Joe. But that was an interesting project, too, that was sort of bringing the smart contract on chain, you know, on chain, rather than having the smart contract, you know, be somewhere else. And then, and then, you know, obviously, the ecosystem has evolved from there. So I think we kind of transited from from building a better Bitcoin to kind of building a better system. One of the things that got us early was we

realized, like, even if you were even if you thought Bitcoin was going to take over the world, and everybody's going to use Bitcoin for everything there have, there had to be bridges, because all of the world's value was not in Bitcoin at the time, you know, 99.999% of the world's value was in systems other than Bitcoin. And so we wanted a system that could support assets other than what we call stable coins today. We call them issued assets, we built the decks in 2012. And we created this platform for sort of interoperability of different kinds of different currencies and assets from different issuers. And we built a sort of social credit and lending system built into the system from the beginning. And I think we were we were sort of very laser focused on solving the payment problem.

Jake 12:45
Right? And then, so if we can sort of carry that forward to today, I think a lot of people, you know, we talked about this a little bit before starting the recording, I think a lot of people are sort of everyone knows, ripple, anyone, everyone in crypto and, and I think there's like a wide sort of appreciation that it's, you know, one of like the OGS, and, you know, just pre existed pretty much everything else besides Bitcoin, maybe a couple others that aren't nearly as prominent today. Basically, nothing has been started so early on how does much staying power with the exception of Bitcoin, and people appreciate it as that but at the same time, I think it's easy, you know, there's, there's newer blockchains that have come about whether it's Aetherium, or Solana or whatever it might be, which people are sort of, at least a lot of, like sort of my audience may be more familiar with, what are people sort of not appreciating about ripple? Like, what has enabled that staying power? And is it you know, how do you think about like, it's just a different use case, right? Where, you know, I think ripple is largely focused, like you said, laser focused on on sort of payments and bringing these, you know, other assets, like sort of connecting it and making the interruptive interoperability happen, working with financial institutions, as opposed to just strictly trying to disrupt. So what's sort of like the misunderstanding, what don't people really seem to get about ripple?

David Schwartz 14:10

Well, one thing that I think I kind of have to point out is that like, ripple is a company that has, you know, employees and has offices, and we have a product called ripple net, which is an enterprise payment system that's not really decentralized. It's, you know, it's regulatory compliant, it does sanction screening, it's, you know, integrate in payment companies and banks in their transaction flows. And we built that to enable sort of top down adoption of blockchains because, you know, in 2014 or 2015 when we embarked on that strategy enterprises didn't want to touch blockchains they had no right it's a very different now but they had no interest in touching blockchain. So let's build a payment system that can settle using digital assets, but that provides better better features even if you know even if they can use for their traditional Forex tasks even if they're going to not use touch a cryptocurrency they still get a better payment experience, and they're able to settle with cryptocurrency whenever they're willing to do so. And of course now, you know, we pretty much only looking for customers that are willing that will settle with a cryptocurrency. And that allows enterprises to access blockchains, like the XRP ledger and tokens like XRP without being exposed to a system where they might receive money from a terrorist or they might, you know, if you enter if you enter, enter public key and operate on a Dex, you have no control over your counterparties. Right. And that's not that's a no go for institution. So ripple is a company like on the institutional adoption side has built this compliance system on top of public blockchains. Like the XRP ledger. As far as the XRP ledger ecosystem itself. I still think the XRP ledger is the best blockchain for payments, you know, transactions are completed in a couple of seconds, they cost a tiny fraction of a penny, we have, you know, full fledged decks, we have issued assets, we have NFT support, we have a variety of what we have most of the things that you would want to do with a smart contract probably 80% of what you'd want to do with a smart contract, we do through smart transactors. But the downside is if you want to do something that can't be done with the existing transactors, just like a Bitcoin, like if you want to have collateralized lending on Bitcoin, Bitcoin doesn't have any way the Bitcoin Blockchain doesn't have any way to provide that smart contract capability. I would say think about the XRP ledger as sort of somewhere between Bitcoin and Aetherium. In terms of functionality, in other words, it provides more functionality than Bitcoin but not as much as Aetherium.

But it balanced against that is it's much faster, it's much cheaper, and it's also much more secure. I'm sure you've heard stories about people who agree to smart contracts and don't know what the smart contracts do. You don't have that prot like you can't use a Dex within on a theory without interacting with a smart contract. You can't use an NFT without interacting with a smart contract, you don't need a smart contract. And so that means your tool understands all of the behavior of the DAX and all of the behavior of the blockchain because their core blockchain functions. So it's not as flexible as a theory. But in exchange faster, cheaper, and you have that higher level of security where you can't you don't have to worry about a smart contract doing something you didn't anticipate.

Jake 17:01
Right. So one, just quick sort of confirming question, is it? Is it fair to think about the sort of centralized blockchain that you guys made to help sort of institutions come in is a sort of like a gateway blockchain almost where people are like coming in. And they're more comfortable using that because it's not, you know, because it's not decentralized. But then they have the opportunity to sort of interact with that decentralized blockchain world from that blockchain.

David Schwartz 17:28
I think enterprises, what enterprises see this attractive about ripple net ripple net is that they can control their interaction with it completely, like they're in all their transaction flows, right, it doesn't execute a transaction for them sort of behind their back, and they can control who has access, they can veto operations that provides them that very, very high high level of control, I don't think they're going to be willing to interact with blockchains more tightly, until and unless we have sort of compliant islands sanction screening, like if you can receive money from a terrorist or send money to a terrorist, that's a problem. So that's a no go for enterprises interacting with most exes. And so and so what we realized was that there would have to be this sort of compliant Island. And that's what ripple net is. But XRP is a token can still be used on ripple net, of course, what will happen is a server will command a transaction, either through an exchange or on the XRP ledger where the actual XRP token was, so you have the settlement mechanism that you

can settle continuously rather than daily, or even, you know, every several days, you can do t plus nearly zero settlement, and its jurisdiction was asset. And so it can be neutral. Of course, it still ripple net itself was not jurisdiction list, because ripple has significant control over the system. It's our software. And of course, you know, we have we're in the US court orders us to do something, we have to do it. So it's it's somewhere in a middle ground between a traditional payment system and a blockchain a blockchain system. And then as enterprises increase their comfort level with what they're willing to do, we definitely expect to be offering more blockchain services to enterprises, you know, in the coming year. Yeah.

Jake 19:03
And so I understand, like, part of your original motivation was basically seeing how, you know, archaic the SWIFT system was, and realizing that there could be a much better system there. And it would be far easier to start from a blank slate with these new technologies than to go and try to reform an old and broken technology. Can you explain to people, you know, what was so broken? Or what is so broken about Swift? And why that blank slate approach sort of made sense and sort of relate that to what you've just said, around, you know, both XRP. Net and XRP ledger? Sure.

David Schwartz 19:38
So there are a couple of there are a couple of problems with Swift. But the big one is that is just ancient, you know, when you use an app from your bank, you know, from your bank or financial institution, if the website looks cool, the app looks cool, but if you go down just a couple of layers into the plumbing, it's like getting into a time machine. You know, you're back in the 60s and 70s, you know, 70s If you're lucky 60s, if You're not lucky, they don't use any of the cryptographic algorithms that have secured the modern internet. You know, they may be used them for, they maybe have an authentication layer wrapped on top that uses them or like, but they don't use them like in their fundamental internals. And it's just a messaging system, it just pushes messages around, it doesn't like check to make sure that the recipient exists before the debit occurs at the source, it doesn't make sure that the recipient can accept the flow of money before the money starts to flow. It doesn't it doesn't negotiate fees

ahead of time, it doesn't even know the path that the money is going to take. Email is so much more technically sophisticated than then Swift, that it's just ridiculous. Some of the delays in the system come back from the days where somebody literally physically had to take a tape from one machine to another machine. And they can only do that when the bank was closed. Because when the bank was open, the tape needed to be on the bank machine. And when the bank was closed, it went to the machine that would like synchronize with other banks. And so swift is a slick messaging layer. But that's all it is, it just sends a message, it just sends a message from one point to another point, it doesn't really do much of anything else. And what we realized is that if crypto institutions were going to adopt cryptocurrencies, they couldn't use a messaging system like that, they couldn't just move money around and hoped that it got to the destination a couple of days later, like, they'd have to know the path, they'd have to know the rate. They'd have to, you know, they'd have to have clothes, they have to know what compliance information they needed ahead of time. And we heard from banks that payments, like were terrible, their experience with payments was bad, because customers would call them up and say, hey, my recipient didn't get this payment. And they'd be like, Oh, maybe give it another couple days. Okay, we'll look into it. And then they didn't know they would have to, you know, they would have to call up like institutions in the path and try to track now the experience was just very poor. And most of the time, the problem was just that they didn't have the information that was needed at the beginning. But like, email does all of those things with that negotiation ahead of time. And so we realized, like, if we wanted that institutions to be able to adopt cryptocurrency, first of all, our in would be a better payment system. And then that payment system would enable settlement with a digital asset, and so on. And so and so that's kind of what we built and institutions were receptive, even in the early days, even if they had no interest in cryptocurrency, they were still receptive to having a better payment system. And so some a lot, you know, a lot of our early customers just wanted to use it, you know, to move to move assets, Fiat assets around and that's fine. And then it's transitioned today to a network that settles using the movement of the digital assets. So it can it can settle, you know, day or night, like the crypto the

crypto ecosystem runs 24/7. It doesn't have holidays, it's global. And so that passes all those benefits down to institutions.

Jake 22:37
Right, so what's your current sort of view on the landscape? Like, obviously, Bitcoin has, you know, persisted since you first got into it? And ripple, we, you know, we talked to talked about the same and Aetherium as well. Like, how many obviously, there's 1000s 10s of 1000s. However, many of these projects, how many of them do you think have a genuine sort of position in the market, sort of a lasting position and are genuinely useful? versus things that are not so useful? Do you look at you know, like, ripple is going to be this is like the end all be all in the number one and everything else is going to fade? Or is this going to play one part of a broader ecosystem in which you sort of respect and understand the uses of multiple different blockchains? I'm very

David Schwartz 23:24
firmly convinced that it's going to be the latter approach. You know, what, if you think about, like, what makes the internet so great, it's the fact that you can access lots of different things. And there's websites that there may be 50 people that care about it, but it's but there were 1000s of those websites. And so this, you know, 10s of 1000s of people, hundreds of 1000s of people who benefit from that the great thing about the internet is whatever you want, you can find it somewhere. And if it's not on the internet, well, why the hell is it on the internet? Like, what's what's going on, right? Like you expect everything that you need, from an information point of view to be on the internet. And that's what makes it great. And the fact that if I want to build something, I come up with some new idea, I can put it on the internet, and everybody can access it immediately. I don't have to go, I can start to grow my audience, from a group of people who can easily access the thing that I'm producing. That has to be what happens to the cryptocurrency ecosystem? I don't see I don't see any way where there's one where there's one winner, I just I don't think like, you know, big bitcoin is the granddaddy and it has high value. But if you couldn't add smart contracts like directly to it, you would have to at least add them because because you're going to you're going to take away what makes it great. You can't have you know, NF TS bloat

the size of the database and the number of transactions but people love them, should we say should we have to make a yes or no decision for like the universe of whether NF T's are going to be a yes or no? Then there's going to be all of these painful trade offs that we have to make and innovation will be hard. Like and one of the great things about innovation is you can build a new project whether it's on an existing blockchain a new blockchain bridge, whatever you want. What we what we need is like a group of people, millions and millions of people who have access to the entire ecosystem, just like they have access to the entire ecosystem of information with the Internet. And then they can find whatever they want and get great experiences. I don't foresee any world where there's one company. Imagine a world where Google is the only successful internet company. It's preposterous, right? It can't possibly, it can't possibly happen, because Google would have no target customers, right? Google, Google's target customers are like people who live on the internet, like they're their number one, target customers. If you look at Twitter, I love Twitter, Twitter benefits in the fact that I have home internet access and smartphone. But I wouldn't have those things just for Twitter. It's not that maybe I would, but most by Twitter wouldn't be as popular as it was, if you had to buy a smartphone and a computer and internet access, like just to access Twitter, it wouldn't have a target market, it wouldn't, the ecosystem wouldn't be attractive to people, I think there's going to be a world where there's room for lots of projects to eat to find a niche. And I would say also, like, it's very stupid for us to fight over who has a bigger slice of the pie today, because the pie should be many, many, many times bigger than it is right the set of people who are using who in the cryptocurrency ecosystem is tiny, and we should be working on giving people better experiences. That's why I think interoperability is important. And you know, if you love a particular token, but but the chain that that like, you might love Bitcoin, you want to hold lots and lots of Bitcoin, but you want to interact with smart contracts, like that shouldn't be painful, that should be that should be painless, because that's the thing that like lots of people might want to do. And if you give, you know, when you build a business, you can either give customers great experiences, or you can give them terrible experiences, but build them in a way that benefits you. And if you try the latter approach, you just won't have any customers, right? Because

they're not going to get good experiences. So my philosophy has always been give the customer the best experiences they can whether or not you know, if they really want to use the technology, that's not one of our technologies, give them a great experience. So you'll have them as a customer. You know, one of the arguments that we get sometimes is like, Well, why do you allow people to use other assets on ripple net shouldn't just be XRP, it's like, well, but then if somebody can't use XRP, then they can't be a ripple net customer. And then when they can use XRP, or when we do have when we have to acquire them as a customer. And then our customers will get, you know, poor experiences. You know, imagine if Twitter tried to lock Twitter users into just using Twitter and not being able to use like Amazon? How would how would that you have to be so powerful and so dominant to get away with that strategy, and you still produce a worse experience for your users. And we're at the point now, where we have to give people phenomenal user experiences. Because growing the set of people in the space, it should be our number one priority, like the pie should be 100 times bigger than it is. And so fighting over who gets what slice as far as the XRP ledger is niche. I'm not exactly sure what the right niche is. I mean, it was designed for payments in the beginning. And I think payments are definitely like a use case where there's good product market fit. I also think that you might see a growth of sort of side chains around the XRP ledger with the XRP ledger because of like a hub for group of side chains where a lot of the liquidity and payments take place on the XRP ledger, but the smart contracts and maybe things like NFT storage and all these weirder you know longtail use cases happen like in other parts of the ecosystem, where the sort of the benefit of the XRP ledger is that sort of fast, cheap, reliable glue that holds some of those other pieces together. It is a little it was a little hard to say. And of course it's not it's certainly not my decision, like how the XRP ledger ecosystem evolves, everybody's building different things. And it's hard for us to predict, you know, what's going to be successful?

Jake 28:36
Yeah, no, I definitely echo a lot of that sentiment on on growing the pie rather than, you know, fighting over the size of a slice and everything like that. It sounds like you know, you're you're very focused on interoperability. I know you've written about this as well.

Obviously, being in the space for over a decade. Interoperability, I'm sure it's something that you've sort of like thought about for a long time. And I guess what's your sort of? Are you surprised that things are still somewhat as siloed as they as they are? And sort of what do you think of the status of interoperability today and where it could be in you know, five years or sometime in the future? And, you know, maybe speaking to the role that ripple can play there as well.

David Schwartz 29:20
I guess, I'm not sure whether I'm surprised or not. I mean, I guess it's I don't part of the problem is that people are very tribal. And there's a very strong instinct to try to lock people into your ecosystem and sort of not let them go. I think we've tried to fight against that. And I've tried to I've tried to sort of evangelize against that but even like, even with people like who I who I speak to a lot and who sort of say the right things about it. It's still this instinct to kind of trap people in your to build walls around your customers so they can't escape. And it's a very even when you convince people like hey, it's not in your interest to do so you will you will be more successful if you don't do that there's still this sort of instinct of tribalism in the space Harvard is because it's so tightly connected to money. And so if I threaten your narrative, I'm like taking food out of your children's mouths. And so it's like, it's not that surprising to me that people are very tribal. And that's dragging on interoperability. It's also really hard. Just from a technical standpoint, I mean, we could talk for a long time about the challenges in their operability. But the big the big, it presents security challenges that we don't face and other parts of like, you can't steal Bitcoin from the Bitcoin Blockchain because the only place Bitcoin can be is on the Bitcoin Blockchain. Right? The one place you can steal Bitcoin from is the Bitcoin Blockchain. So the Bitcoin Blockchain doesn't have to protect Bitcoin from sort of leaving its ecosystem. But when you have these when you have bridges, and when you have the side chains, you have the risk of the cryptocurrency leaving the ecosystem, and there's no recovery at that point. And that creates interesting security challenges. And people are really laser focused on fixing that problem right now. I think there's a huge, there's a lot of different companies working on working on technologies like zero knowledge proofs, and other other types of getting the incentives

right, I think we're seeing a lot of focus on interoperability, not just as talking points, but like as technological evolution of better ways to create interoperability. So that's, that's encouraging to me, you know, it's one thing when everybody will say, hey, we think interoperability is great, and there's a lot of hype around it. But you understand that, like, a lot of people don't really see it as in their best interest to build that technology. It's another thing, when you actually see rapid technological evolution, things like DK roll ups, which like, directly improve the ability to do to solve these kinds of problems. So I'm excited, I do think within the next year or two, we will really start to see solutions that like we're really, really happy with but, you know, I'm sure you've heard stories of funds being stolen from bridges and side chains. And so we have to we have the security problem is is very technically challenging. So, okay, we gotta get that right.

Jake 31:47
Yeah, I feel like the interoperability, you know, it's been like a story for a long time. And it feels like the the sort of practical execution of the philosophical approach of growing the pie rather than, you know, fighting over slices. And so hopefully, that comes along sooner than later. I want to talk about a couple other sort of elements that I know you've been thinking and writing and talking about recently, in regards to sort of like, where, where things are in 2024, and where they're headed. One of those is sort of the tokenization of real world assets like real estate, you know, treasuries and bonds and, and how that could become sort of a driving force for the blockchain economy. Can you speak to sort of your thesis there, and where we are, again, sort of on on the progression of things and not sort of line of growth?

David Schwartz 32:39
Well, I'm very fortunate that that's an area that the XRP ledger technology fits very, very well to, you know, we have issued, we have issued assets, we have an NFT platform that can that can map real world assets, we have a decentralized exchange, and we have pools of liquidity. So it's a good place to use that type of technology. And I think that's going to be a it's going to be a big one. Things like carbon markets, commodities, treasuries and bonds. And one of the big

advantages is transparency, more less friction in the transactions. And I think another big one is that it's tied directly to collateralized lending. So I think people being able to monetize their portfolios of real world assets is going to be, you know, a major use case. And I just want to say one thing about that just just as sort of a side here is that people think that like, oh, that's just a way for like rich people to tax optimize, like, Why should I be excited? Yeah, it's great to help rich people, but tax advisers money men doing it, but why? Why should I be excited about that? You know, I think the reason that you should be excited about that is, is don't think about the borrower or think about the lender, the lender has a way to get a low risk, because it's collateralized right by real world, so they get a low risk return. And that's something that you know, maybe if you live in the United States or the EU, you have access to your money, you have access to any number of investment products that allow you to easily get a return at whatever level of risk you want. But there's a lot of people who their choice is basically stuffing money in a mattress or putting it in a bank that may or may not like be stable, or where their currency may depreciate, their ability to lend assets, hard assets, whatever assets they want, that are secured by portfolios of real world assets could be, you know, a tremendous tool for Financial Inclusion. So it's exciting, it's exciting in that way, and this is also a good way to bridge find that, you know, traditional finance onto blockchain. You know, I it's, it's much harder to see like traditional institutions like participating in a DAX, or participating in weird smart contract banks, but hear, all they're doing is what they've always done. Like they've, they've basically, they've basically made digital representations of every, every every brokerage gives you a digital representation of your ownership of a security, right, and they allow you to trade that and that's all they have to do. And it's tied right into this defi ecosystem. So I think that's good for institutional adoption, good for sort of retail adoption, and also interesting for things like financial inclusion, you know, for people who don't have access to those those great products. I think you're gonna see, you know, better pools of liquidity, better institutional adoption, and so on. And I think like, that's really accelerating. Now I think like the landscape at the end of this year is gonna look very different than it does today. Right.

Jake 35:12
So one other question sort of going off of that. I feel like so, ripple seems to me, it's there's always been sort of a story of, you know, working with corporations and banks and financial institutions and things like that, I'd say more so than, you know, some of the other like larger block chains and things like that. Is there any I know you're like, huge on, you know, censorship resistance, you talked about when you discovered Bitcoin in the first place, like it was just like a 10 out of 10. For all these matches, that sort of the things that you care about, and are interested in your philosophy and everything like that? Is there any sort of risk, from your perspective, that sort of the institutions become sort of that not only do they get into, you know, these various blockchains and crypto, but they sort of become so prominent and so powerful, as actors within them that we sort of lose the opportunity that blockchains brought to, or decentralized blockchain is brought to, you know, sort of enable that censorship resistance, we sort of forfeit it to some of these large, powerful parties.

David Schwartz 36:13
So I give us sort of qualified yes to that. I do think that is a real risk. And I think you're already like, the best example that already happening is you're already seeing like, in blockchains, like Bitcoin and Aetherium, where some miners are just choosing not to include transactions from addresses that have been sanctioned by major jurisdictions, like you're already seeing those sort of first inklings of censorship and the communities are going to have to decide do they value institutional adoption? Or do they value censorship resistance? And is the is it a red line that there can't be any, any censorship resistance at all? Or is there a line that like if something is widely understood to belong to a terrorist organization or something like will tolerate that level of censorship? I think every blockchain is going to have to tangle with that. When and if there's regulatory interest in that blockchain, you know, Aetherium, didn't want tornado cat, you know, nobody wanted. Nobody in the blockchain ecosystem wanted the tornado cache issue to happen where like specific addresses on a blockchain were published as addresses not to interact with and we understand that if you're in that jurisdiction, it's very difficult if you're a block producer, it's very difficult to produce

transactions that you know, that you could be criminally charged with, like knowingly, you know, it's not good. And so so that's, that's gonna happen, and that's going to play out across the entire ecosystem. And I don't think that technologies are going to matter. I don't think any blocked. Every blockchain censorship, resistance depends on people not tolerating censorship. Like if the miners decide that it's more than the institutional adoption is more valid miners and Bitcoin decide the institutional adoption is more valuable to them than pure censorship resistance, then they might do that. And then people might decide, like, maybe we'll switch to switch, like, it's not impossible to switch Bitcoin into proof of stake. But boy, that's really like, that's a, you know, that's not something that would have been trimmed, and they would they could face a choice where they're gonna say, Are we willing to abandon the way that we generate blocks and change it to something else? Or are we willing to tolerate some censorship, but then you have the boiling frog thing? Like, right? Like, you get censorship, envy, like if the United States government can censor tornado cash, then maybe, you know, Russia is going to want to censor money that's going to people in the Ukraine who they claim, you know, some people may see this freedom fighters, they may see them as terrorists, you know, it's gonna be like, Oh, well, do we tolerate that or not? And then we get that that is gone, that is gone, we're going to have that Shakedown. And I think it's technologically independent, I don't think that design of the blockchain makes any difference for how that works. I really don't. Because ultimately, what it's going to come down to is do the users of the blockchain tolerate the censorship resistance, because you can use it as a blockchain can change any rules that chain right, there's nothing in Bitcoin that couldn't be changed, if node operators decided to change it. There's nothing in the XRP ledger or software or behavior that couldn't be changed. If the people who run that software want to change it ripple can't stop them, you know, Satoshi can't stop them. Vittala can't stop people from changing the Ethereum software if they want to change it. And ultimately, it's going to come down to what the communities are willing to stand for. And I don't see that happening in the short short term, particularly, but I do think that is going to be a long term issue. I think that's gonna happen across the industry. Yeah, it's,

Jake 39:18
it's interesting to think about, like, I don't know that I have, like a fully formed perspective on it. But what I sort of observe is like, you know, there was, you know, Bitcoin and ripple and Aetherium and Solana, and they've progressively become, you know, less decentralized and sort of devalued the importance of censorship resistance relative to how fast is this or how cheap is this or something?

David Schwartz 39:44
Is that is that I mean, I don't know that that's, I mean, I don't know if that's true. I certainly in the XRP ledger ecosystem, I haven't seen anybody pushing for any kind of censorship at all. I mean, I have ever seen anything.

Jake 39:55
Well, so would you would you accept the premise that taking XR PL out of the equation? Obviously, you know that's that's the world in which you're in, but I'm just looking at Bitcoin Aetherium and Solana like Bitcoin is more decentralized than Aetherium, which is more decentralized than Solana.

David Schwartz 40:14
I guess it gets it gets, it gets tricky. I mean, I understand why people say that, and I understand what's behind that. But I think like in all cases, what it's going to come down to is like, if you think about why do I want us system to be decentralized? Because I want censorship resistance? Which of those systems? Is Bitcoin really more censorship resistant than Aetherium? You know, is it?

Jake 40:36
Well, so I guess you're I don't know, I'm planning this out sort of in real time. But I guess, going off of what you were saying that ultimately lies in the hands of sort of like the node operators, it would be easier to accumulate a consensus in the more recent blockchain than in Bitcoin, for example.

David Schwartz 40:55
I think that's probably I think that's probably too I think, I think what you're looking at is how hard is it to change up so this is a

plus and minus. So what was were we really against? Like? How hard is it to change a blockchain? But bitcoin is very, very hard to change. Aetherium is not as hard to change, but still pretty hard. Solana is a little bit easier to change. But I mean, obviously, there's a good and a bad in that, you know, the XRP ledger is probably I don't know, God, I think that's a it's probably easier to change than Aetherium. But I don't know if that's a bad thing. I mean, if the XRP Ledger was hard to change, it would be today the same way it was, you know, in 2012, and it wouldn't have NFT support, it wouldn't have escrow support, like it wouldn't have. I don't know that being easy to change isn't necessarily a bad thing. As long as you know, as long as you can sort of put the brakes on when you need to which I think, you know, if you look at what happened with Aetherium, Aetherium, classic fork, like there was a dispute over governance, and then they parted ways. And you can always part ways. I don't know. I guess I guess what I would encourage people to think about is when you talk about whether something is decentralized or not, don't just think of that as a switch that has like a position to think about, why do I care whether this is decentralized? What do I want to be able to happen? Or what do I want to not be able to happen? And then really think through, like, how likely is that to happen or not happen? And that's sort of like the way you should be thinking about it, rather than having this box called decentralization that does all these different things in it that that kind of gets confusing,

Jake 42:26
right? Yeah, no, I tend to think of it as sort of like degrees of decentralization, rather than sort of an on off switch, like you said, and to me, the primary, the primary sort of benefit, like decentralization is a means as opposed to an end. And I think of it especially when it comes to money as being a censorship resistance sort of issue as like, sort of the end of the means of of decentralization. So, anyway, I look at that sort of whether you agree with the premise of the trend or not, I guess, my concern, or just the thing that I've been aware of is like, do people actually care about censorship resistance, like people say that they care, but they're to the point where they will prioritize it, when there's all sorts of other trade offs? And like enterprise adoption? Exactly. And so if they don't, what happens to sort of the current era of blockchain

projects regardless, you know, pick your project? And is there another opportunity in the future to, for someone to come along and create something new, that, again, gives us this opportunity to have more absolute censorship resistance? Or is this sort of like a, you know, one shot at you take it or leave it sort of situation? That's irreparable, irreparable? I don't even know how to say it, but not replicable? To some degree?

David Schwartz 43:48
Yeah, I think I think you're absolutely right. I think that is the right question. I think one data point is if you look at change, like z, cash and Mineiro, that have these sort of extra privacy features that make censorship more difficult, because you don't know your targeting, they have not really been all that popular about that might be because of it, you know, because for other reasons, but like if people really, really wanted censorship, resistance is a big thing. You would think that those platforms that can that can more strongly provide it would be more popular. And I think right now, there is a trade off of like, we don't want to adopt features, specifically to hide the origin and destination of funds, because we want us to tional adoption, we don't want to provoke regulatory, you know, there were there were regulatory sanctions in some countries, specifically against projects like z cash or Manero, that didn't affect other projects. Like I don't want to be on the list of the projects that like, you know, exchanges in this country in various countries can't access I think there's a tension between everybody who, like you said says they want censorship resistance, but when the rubber meets the road, and it's like, well, that might if we add these features that might get us banned in some countries, that might mean there's less institutional adoption. That might mean this, this regulatory pushback projects don't want to like when the rubber meets the road. People were concerned about the bottom line and more concerned about their bottom line than their philosophy in many cases, and I think that is going to be something that you're going to see throughout you're going to see that tension throughout At the industry, and you can make technical changes to blockchains that give them more censorship resistance. And it's interesting that like, there generally is not that people are not that receptive, like Bitcoin could add, you know, a zero knowledge proof of fund transfer mechanism. How popular Do you

think that would improve its censorship resistance? And I think you'll find that people are not super interested in doing that, because they don't want to rock the boat like they don't want to be I don't want to institutional adoption back off because it affects them. You know, everybody who if you believe bitcoin is going to be the next best thing, you probably own some bitcoin. And so you have a financial stake in bitcoins, like acceleration not being taken off track. And the question is, are you going to sacrifice your principles for that is a funny thing. When I when I first looked at Bitcoin, a lot of the narrative was like, the big banks and the big financial institutions and the government's are going to tell you to use the technologies that enrich them and not these way better newer technologies. And now like you see big Bitcoin, I feel silly, saying that basically saying the same thing. Like don't use these other technologies that might be cheaper and faster, and might be better suited to your use case, use Bitcoin, because it's decentralized. But what they really mean is because it enriches me because I own a lot of Bitcoin. And in an ideal world, we would have this perfect synergy where we could maintain principles like censorship, resistance, and also, you know, but obviously, it remains to be seen how people are going to make the act when they when they actually have to make that trade off. They may like they may let censorship resistant slip. And I don't know if there's anything we can do about it. Because they don't they we build the technologies that allow them to be more censorship resistant than we like, Yeah, we don't want to do that. Yeah,

Jake 46:30
I think at the end of the day, people will get what they really want. And we'll just see what people really want.

David Schwartz 46:35
Not what they should want what we think they should want, right? Like people should want more privacy, but

Jake 46:39
or even what even what we want to walk. Like, you know, you might want to want to, you know, do your exercise or whatever, but you really want you just want the pizza, you just grab the pizza. It's definitely something. It's a hard.

David Schwartz 46:52
It's a hard problem. We struggle with it in all areas of life. And I don't think this is an exception.

Jake 46:56
Yeah. So I'm glad you brought up Z cash and Manero. I remember, like, when I first sort of came across z cash, I don't remember the exact time or anything, but I remember I was just like, wow, this makes like a ton of sense. Like, this is really interesting. And this is definitely going to like, catch and be like super popular and everything like that. And then you just like wait, like, year after year after year, just like nothing happens. I'm like, oh, like, that's not really sure why, like, intellectually, I would think this would be very popular and important, but like relative to Bitcoin, for example. But it's just didn't happen.

David Schwartz 47:34
So you know, how many times how many times have you heard of, like, venture capital, people will hear a pitch like, I'm gonna have this great idea. It's just like Twitter, except you have to pay for it. But we like protect your privacy. Like, yeah, that's not gonna, people should want that. But they don't. Right.

Jake 47:50
So anyway, I know, we're coming up on time, pretty soon. But um, we I know, we've hardly scratched the surface on XRP ledger. But is there anything in particular that, you know, we haven't touched upon that is worth mentioning, especially just sort of in the context of where we are, you know, starting the year 2024. Looking forward to the future, and you've been there for a dozen years now? Is it going to be a dozen more? Or what do you think?

David Schwartz 48:16
Well, for me, personally, I can't I keep telling, I keep feeling like there's one more thing I need to do, and then my work is going to be done. And then I'm going to slow down. And I've slowed down a little bit. But you know, I had the pedal to the metal for like, eight years, just working every it was amazing in the beginning, but obviously

that's not sustainable. And I'm getting older. And so I'm trying to focus on where I can have the most impact without being you know, me writing code 24 hours a day or so. And so for me personally, like, you know, I mean, obviously, I'm still involved in this project. And I keep finding one more thing to do, I think, for the last four years, and like when I finished this one last thing, but I really profoundly feel like my work isn't done. And I do profoundly feel like a sense of of ownership and pride in you know, what the ecosystem has become, as far as the XRP ledger goes today. You know, we had that victory in court that XRP is not itself a security which is, which is great. We have a blockchain that's produced almost 80 million Ledger's now, I think just over 78 million, Ledger's you know, operating since 2012. You get the transactions in three to five seconds at a tiny tiny fraction of a penny you know, low energy use. So you've got we've got the world's first DAX, we've got issued assets, we've got all these features. We've got this new features in the pipeline, like an automated market maker, cross chain bridges, side chain ecosystem that's growing. So I think it's I think it's an exciting ecosystem. I think part of our vision for the future is like in the XRP ledger as a hub for sec for side chains, which will allow people to innovate right at the blockchain layer. It's exciting in and I'm also excited about all the technological innovations going on in space like we talked about particular About bridges and interoperability and, and also like all the partnerships, that ripple is built around things like real world asset tokenization right now is that's kind of like being a big area of looking for partnerships for us so and then I get to go to great events like, like apex, which is going to be an Amsterdam this year, which is going to be a group of XRP ledger developers. And that's, that's always just fun. That's always just fun. For me. It's just, it's just an amazing thing to see what other people have built on top of, you know, technologies that you've been working with. Yeah, it hasn't been more than a decade now. So yeah, maybe 10 more, we'll see.

Jake 50:37
Ya know, no, I respect the persistence. Basically, anyone working on anything for over a decade is a lot of sticking to it. And that's definitely a respectful thing. So anyway, I know we're up on time, but I really appreciate you taking the time. It's been awesome talking

with you. And you know, before this conversation, I really enjoyed reading some of your writing and listening to you speak as well. So, but it's been a pleasure. I really appreciate it and I look forward to keeping in touch. Thanks, Jack. This

David Schwartz 51:02
was this was a lot of fun. I really appreciate the opportunity to talk to you