EPISODE 573

[INTRODUCTION]

[0:00:00.3] JM: Podcasting about cryptocurrencies is a strange occupation. You get e-mails all the time from companies that are doing a token sale that you would never want to be affiliated with. You get angry tweets from anonymous Twitter accounts that are on one side or another of the Bitcoin scaling debate, and you also get to interview extreme personalities. The technical discussions around cryptocurrencies can be highly educational.

Brian Fabian Crain started the Epicenter Podcast four years ago. Podcasting about cryptocurrencies allows a podcaster like Brian to report on a wide variety of areas; economics, software, philosophy and the stories within the blockchain world itself are overlapping among all these different topics. Epicenter is one of my favorite podcasts about cryptocurrencies, because Brian is always prepared enough to ask sophisticated questions.

In this episode, we talk about a wide variety of things. We talked about ICOs, when does an ICO makes sense. It seems that many token economies could function just as well without a token involved. We discuss what these token economies will become if their token is not necessary. We discussed the scaling approaches of Bitcoin and Ethereum; why are these two block chains taking very different approaches to their scaling plans. We also talked about Chorus which is the company that Brian founded to build infrastructure for proof of stake cryptocurrencies.

I enjoyed talking to Brian about all these different subjects and I look forward to having him on again in the future. I recommend anybody who is a fan of the cryptocurrency shows we've done to check out Epicenter. It's really a great show.

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[0:02:00.4] JM: Azure Container Service simplifies the deployment, management and operations of Kubernetes. Eliminate the complicated planning and deployment of fully orchestrated containerized applications with Kubernetes.

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To learn more about Azure Container Service and other Azure services, as well as receive a free e-book by Brendan Burns, go to aka.ms/sedaily. Brendan Burns is the creator of Kubernetes and his e-book is about some of the distributed systems design lessons that he has learned building Kubernetes.

That e-book is available at aka.ms/sedaily.

[INTERVIEW]

[0:03:35.9] JM: Brian Fabian Crain, you are the host of Epicenter. Welcome to Software Engineering Daily.

[0:03:40.6] BFC: Thanks so much for having me.

[0:03:42.7] JM: I enjoy Epicenter. It's a podcast about blockchain technology. Why did you start podcasting about blockchains?

[0:03:50.7] BFC: Yes, I learned about Bitcoin in the summer of 2013, the early summer and at the time I was finishing a master thesis, so I was busy with that and it's okay, how do I learn about Bitcoin? Just what I did was whenever I was on the way anywhere, I would listen to a podcast and specifically Lesser Bitcoin, which was the only podcast at the time. That's how I learned about Bitcoin and I had been interested in the podcasting format for a long time and felt

it was just a really powerful way to learn about the topic and you get into a field and an industry as well.

Then soon afterwards, I wanted to work full-time in the Bitcoin space. At the time, there wasn't really any jobs and I didn't have a business idea myself. What I did was, the first thing I did was I started a meetup group and I started organizing events. Back then it was every two weeks and get people to do talks and I gave a lot of talks myself at the time about, I would just take a topic and give a talk about a particular aspect, what it was like, how these work in Bitcoin, or particular aspects about mining, or security of Bitcoin etc.

The second thing I did was that I started this podcast, which was back in December 2013 together with Sebastien Couture. Yeah, we've been running that podcast every single week since the first week of January 2014.

[0:05:16.4] JM: Before you went full-on into cryptocurrencies, you did spend some time in the traditional finance world. I think he worked as a commodities trader. How does the traditional finance world compare to the cryptocurrency world?

[0:05:32.3] BFC: Yes, this is a good question. I grew up in Switzerland and then after high school, I went to the US for college. I went to Chicago and I studied economics at the University of Chicago. Of course, that's a traditional well-known economics department. I had this goal of going to the US from a long time and studying economics.

Then once I got there, I was a bit, I had reached that goal and I didn't have a goal beyond that and I was a little bit lost about what to do. I think like it in many good universities, if you go to an economics department and undergrad people, many of them at that time went into investment banking, and I didn't know what else to do so I did the same thing. I ended up doing an internship with HSBC in New York in debt capital market, so it's creating bonds, corporate bonds.

I liked it and I hated it. What I liked about it is actually finance. I found it was really interesting and I was good at. At the same time, I really hated the environment and getting in there every

morning and there was just so much about this whole structure that I revolted against. In the end, I decided not to do a job there and I went to go traveling around the world for a while.

Then I was again lost and I went back to Switzerland where I'm from and I worked a little bit in this commodities trading thing. I wasn't trading myself. I was doing the trade execution stuff. That was not my favorite job. It was pretty boring. Yeah, I was a little bit lost and then I ended up doing – going back to school and master in economics and then I became interested in startups and technology.

[0:07:15.7] JM: I hear you. I can relate to that. When I was in school, I found finance interesting. I played poker and I liked the incentives, the – I liked looking at charts and thinking about human behavior and how that translates into prices and things like that. Then I found myself looking for a job out of school, and I went into a trading company and then certain aspect – like you said, you love certain aspects of it and you hate other aspects of it.

When I was at a trading company, what I longed for and what I would see in other areas of the technology world is that people, there's other areas of a technology world where stuff really gets built. At a trading company, stuff does get built, but it's mostly its securities, its internal technology to make trading more efficient. Outside of the trading world, you see technology companies where they're building very new things.

In the cryptocurrency world, you see a whole lot of very new things getting built. Do you think these two worlds are colliding? Are the world traditional finance, is that colliding with the world of cryptocurrencies today?

[0:08:30.6] BFC: Well yes and no. I think there is a lot of technology that's encroaching on that world and trying to reinvent it and redo it, but at the same time I think these institutions are so – there's such an institutional inertia on them and so much conservatism and have such a hard time to innovate and do anything new.

I'm quite skeptical about their ability to adapt to this new world. I spent from about middle of 2015 to the end of 2016. I was working for this company called Monex, and that was – they started in 2014 and was the first company at that time to do enterprise Ethereum applications. I

was doing business development for that company, so I spent a lot of time speaking with exactly innovation people at banks and insurance companies and stuff like that.

Nothing ever happened. You have so many conversations and maybe there's some POC after months and they build a little thing and then it dies somewhere. I feel even today if you look, so little has happened on the whole enterprise and corporate side. I feel it's much more that we're going to fundamentally redesign and reinvent how financial interactions work based on blockchain and decentralized technologies. I don't really feel there's going to be so much of a merger as a replacement of the existing system.

[0:09:58.3] JM: What kind of topics do you try to cover on your podcast on Epicenter?

[0:10:02.1] BFC: We try to cover whatever we find most interesting personally and what we find is most important, in terms of the development of all of this technology. That has of course evolved over time. In the beginning, it was at least in title it was called Epicenter Bitcoin. That being said we started doing episodes about Ethereum just a few months in, and we started doing a lot of different topics.

Then over time, a lot of things about regulation, about scalability, about ICOs, about just a lot of different projects, where applications that people were building on Ethereum, or the investment side has also become a pretty big thing, like how to think about tokens and devaluation of tokens and these new crypto funds. We are very broad, and I think we try to cover pretty much anything that's interesting in this wide universe.

[0:10:52.0] JM: Do you try to vet any of these – I've had some companies on the show and when I start researching them, some of these ICO companies I'm a little skeptical of the technical quality of what they're building. I do think it's useful to get a snapshot into the time that we live in, where companies with not very well-developed technology can raise tons of money, or at least they could raise tons of money four or five months ago. Sometimes I wonder, maybe I shouldn't have even had these kinds of companies on the show in the first place though. How thoroughly do you try to vet the projects before you accept them as guests?

[0:11:37.6] BFC: Yeah, well I mean, first of all, we don't have the knowledge nor the time to do some deep technical vetting or look at co-pays or anything like that. Of course, we do look at let's say read the white papers. Okay, is this coherent? Does it make sense? Or maybe look at somehow what stage are they?

In particular, when it comes to projects doing ICOs, what we try to do is unless they have a track record where it's extremely the original idea or the team has done very interesting things in the past or something like that that makes you really stand out, our default answer to that is, “Well, let's do the episode once you guys have launched your product. Then come back to us.”

We do try to not to have too many projects that are in this ICO promotion phase. That being said, we've definitely had projects on the podcast where afterwards we felt, “We shouldn’t have done that. We should have done better, instead of – that was probably wrong to give them a platform.”

We have gotten a lot of criticism for that point. We've gotten so many comments, people saying, “Oh, you guys are promoting shitty projects and you’re not being critical enough.” This is probably number one criticism of us is that we're not being critical enough. We try to be, but we often don't live up to it.

[0:12:59.4] JM: Well, the thing is it's really easy to ask critical questions of these ICO companies, because so many of these ICO companies look extremely opportunistic. Unfortunately, it's impossible to tell the ones who just look opportunistic from the ones who might actually be still standing in five years, like some of these companies I hope will be durable.

[0:13:27.1] BFC: Yeah, I think that's an interesting question, to what extent is it predictable? I do feel it's actually possible to vet projects reasonably well. In particular, okay have they worked on this problem for a long time? I think anyone who comes along and just starts a project, because now there is this ICO thing and you can actually monetize it. That's probably a project we have a skeptical about.

Yeah, I think especially for outsiders of the industry, or who aren't spending a huge amount of time in this, it's very hard to vet projects. Especially it was obvious in the November, December, October last year time when we really had this massive bubble and so many new people started getting interest in this.

All of a sudden, I had all of these people writing me and e-mailing me, they're like, “Oh, I'm starting to get – I'm starting to invest too and I'm buying this coin and buying that coin.” The quality of project that these people will buy is very low, so I think there is a big division, maybe also in terms of who these projects target, when some projects are really just focusing on and then they feel the people who are knowledgeable they will find it. Then there's others that just focus on the marketing, and then they find all of the people who running after this new shiny thing with big promises.

[0:14:51.3] JM: Some of these ICOs, you know I saw the vesting schedules for some of these and they have a two-year – they'll have a two-year vesting schedule, so you'll have people who are starting a technology product, they're doing an ICO and they themselves are running the technology. There's a two-year vesting schedule for their shares of token.

To me, that's the biggest red flag ever, where it's basically, yeah, after two years I can just leave this project and take all of my coins with me. I look at that and make – I mean, maybe that's a cutting-edge idea, maybe that's okay, you leave your project after two years with the idea that your open source community is going to take it over, or is that just self-delusional, do you think? Do you think it's insane to think that after two years, if you start an ICO, if you start a source tokenized platform, in two years if your tokens vest, do you think there are some of these projects where the open source community will just have purchased these tokens and so they will have a vested interest in the project and they will be able to continue to harbor developments in the technology? What should the vesting schedules for these be?

[0:16:14.7] BFC: Yeah. Well I mean, so you're saying two-year vesting schedules, but I think it's much worse. Right, so first of all, even when they have a two-year vesting schedule, for the most part they start vesting immediately and it's more like they vest monthly right over two years. They can actually start cashing out immediately. Of course, if you have – let's say you have a market cap of 100 million and the team has 20% or things like that, then that vesting

over two years, that means you have almost a million dollars' worth of that particular token, that this team can start selling every single month.

Of course, they haven't built anything at that time, at least for the most part, or they've just started. I think you're absolutely right to point out that these projects will not – I think the idea that okay, after two years there's some community that takes it over and runs with it and it just runs itself forever is certainly an illusion. I think we are going to see a massive amount of scams, and we have seen a lot of scams, but I think it's going to be much worse and that there's just so many projects that raises money and they have these tokens and they're going to cash it out, and then these projects all going to die a slow death.

[SPONSOR MESSAGE]

[0:17:39.7] JM: We are running an experiment to find out if Software Engineering Daily listeners are above average engineers. At triplebyte.com/sedaily you can take a quiz to help us gather data. I took the quiz and it covered a wide range of topics; general programming ability, a little security, a little system design. It was a nice short test to measure how my practical engineering skills have changed since I started this podcast.

I will admit that, though I've gotten better at talking about software engineering, I have definitely gotten worse at actually writing code and doing software engineering myself. If you want to take that quiz yourself, you can help us gather data and take that quiz at triplybyte.com/sedaily.

We have been running this experiment for a few weeks and I'm happy to report that Software Engineering Daily listeners are absolutely crushing it so far. Triplebyte has told me that everyone who has taken the test on average is three times more likely to be in their top bracket of quiz scores.

If you're looking for a job, Triplebyte is a great place to start your search, it fast-tracks you at hundreds of top tech companies. Triplebyte takes engineers seriously and does not waste their time, which is what I try to do with Software Engineering Daily myself. I recommend checking out triplebyte.com/sedaily. That's T-R-I-P-L-E-B-Y-T-E.com/sedaily. Triplebyte, byte as in 8-bytes.

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[INTERVIEW CONTINUED]

[0:19:37.7] JM: What do you think is the psychology of these ICO hawkers? Because obviously some of them know that they are complete scammers. I think I saw – what was this one yesterday, like a drone ICO company, or something, where the founder had literally changed the website to some South Park meme that was like, “Hey, I took your money and ran away with it.” That's the extreme end of it.

At the more subtle granularities of this ICO insanity, you have people who are self-delusional, where they have convinced themselves to some degree that their project makes sense and then they're actually building some useful technology, but at the same time they have something like a two-year vesting schedule that like you said, has monthly vesting and so there's some disconnect there. You've interacted with enough of these people, like what do you think is the psychology there?

[0:20:36.3] BFC: Right. I think you're totally right that amount of actual scams is probably not that high, but the amount of projects that are going to turn into some quasi-scam I think is very high. The quasi-scam is exactly the self-delusional thing. Someone with some half-baked idea starts something, they don't really question enough whether this whole thing makes sense, they don't do enough research. Then they run out, they start raising money and put a lot of effort in the marketing. Maybe they raise money.

Maybe ought to say all of the time, just doubt, does it really make sense? Are we competent enough? Can we do this? You go ahead, and let's say people actually put money in it and then I think it's very easy to start believing that this whole thing makes sense, right? The market is evaluating it. It must be a good idea. Then let's say this token starts trading, and of course again, it is very easy to say, “Okay, we have succeeded. We have launched something here.”

Yeah, I think actually the aspect that they're immediately liquid and that you have this market feedback mechanism, can probably contribute a lot to projects thinking they're competent and

they're on the right track and they're doing something and that they're going to succeed and that they have to build value. I think this is the other illusion, right? Just because people are trading it and buying for a particular amount, the idea that okay, now I I deserved these 10 million that these tokens are worth.

[0:21:56.9] JM: Right. Are you convinced that the ICO is a useful tool at this point? Because I've tried to ask some of these ICO companies a question, why not just – if you need a currency for your product, if you need a specific currency, why not just use Ethereum? You could just use or ether. You could just use ether as the currency, your domain-specific currency. I do see the value of having these domain-specific coins within certain contexts just like at an arcade, maybe it makes sense to have Chuck E. Cheese coins at the Chuck E. Cheese arcade.

I'm a little dubious, like you look at Amazon for example, most of the transactions that go through Amazon are in USD. They don't have some – they don't encourage people to build the Amazon gift certificate economy and transact in Amazon gift certificates all the time. I mean, I guess they do have the Amazon credit card, where you get 5% off if you use the Amazon credit card. ICOs could do something like that, where you wash your ether in some ICO transact, or some domain-specific transactionality and then you get a discount or something. I don't know. I just wonder if actually we need so many tokens.

[0:23:19.3] BFC: Right. I think there's multiple things here. One is the question of are all of these tokens necessary? I'm sure in many cases, they're not. They're just there, because they're a great way to raise money. Of course, I'm very skeptical that those projects will succeed, not least because generally they'll be open source. If the token is just added to raise money, probably the token doesn't have a core functionality, it actually adds friction to the product, it makes it a worse product.

You can just fork it, get rid of the token and you have a better product. Then of course, the value proposition is extremely bad. Yeah, so that's one problem. That being said, I do think the idea of creating these incentive systems and rewarding people with tokens, or having tokens for some staking function, or maybe sometimes for payments in an application, I think there is a lot of interesting and positive effect, or aspects of this too.

Of course, Ethereum is a great example. Many good things and so much innovation has come out of that and that and that wasn't ICO. I think that it is both. Now at this point of course, the ICO has become, I think an extremely risky way to go, also from a legal and regulatory perspective, especially if you do anything with US residents, US people.

It seems pretty clear that at this point to trend this very clearly away from ICOs and having some private sales and then having maybe tokens that are given now to users in an application. There's pros and cons to that. I mean, on the one hand, maybe it will mean less fraud maybe. It's certainly less risky for these projects, but on the other hand it's also a little bit sad, because even though there are a lot of bad things about ICOs and we've spoken about the bad things and about these tokens, one of the great things is that it has opened up access to investing in these things to just a huge range of people. That's great, right? This democratization of finance and of these applications, they are getting lost currently.

[0:25:38.8] JM: Completely agree with that. I really like your point, if the technology make sense, but the fundraising – it's not clear how to fundraise, so they tack on a token in order to facilitate fundraising. Well, if the quality of the technology pans out, then somebody can just fork it and make it compliant with ether, or make it compliant with USD, or Bitcoin, or whatever is a more widely accepted currency than the value of the token is just going to go away.

You're an economist. Take something like Filecoin, right? Filecoin is widely accepted, even among a lot of the skeptics as this is one of the higher quality token sales. I could imagine a Filecoin network where you don't – you're not required to transact with Filecoin. From your economist side of your brain, do you have a set of criteria where you can look at an economy and say, "Okay, this economy is something that is going to make use of a token in the long-term, rather than just a short-term fundraising vector."

[0:26:49.6] BFC: I think that the key question, or the key point to start at just is it would it be possible to build this application without that token, or does this application gain something essential from having a particular token?

If you look at something at Bitcoin, you could not have Bitcoin without Bitcoin of course. Again with Ethereum, you couldn't have Ethereum without the native token to pay for gas and

transaction fees, right? In each of those cases, they're actually absolutely fundamental component of the network.

Again, if you look at now a proof of stake networks, well the staking token is essential for the security from network, so you need that. Then I think there's a strong use case for it. Now if you look at the – a token to pay for particular application, then I think probably in most cases you don't need that. I think I'll probably look at it through that lens. First of all, is this token necessary?

Then assuming it is necessary, then of course there's questions about valuation and supply and the quality of the project, the quality of the team. I think, I would probably look at it through those two angles.

[0:27:57.8] JM: Yeah. What I wonder is to what degree the network effect comes into it? Because if you look into, I like everybody else in the Silicon Valley herd has taken a look at Sapiens and Sapiens, he writes a lot about why do people use money. A lot of the reasons that people use money is because we have all told ourselves enough of a story about paper money that we all believe it, and so we're all willing to transact with it. There's this network effect quality, where it doesn't even matter if there's some intrinsic need for it once a currency passes a certain threshold of wide acceptability, it becomes valuable.

There is this network effect that can emerge this tulip phenomenon. It's almost like, maybe trying to pin down some intrinsic value is less important than is the project structured in a way where the token can achieve network effects. You look at something like Filecoin, okay so IPFS is useful even without the foul coin network, as we've seen with the Wikipedia, it's like censorship-resistant file storage network potentially. We saw with the Wikipedia in Turkey thing that evaded censorship. I'm not sure to what degree people were actually using it, but there were some practicality there.

You could imagine IPFS becoming widely useful, and at the same time you're gradually having investors have access to Filecoin via presale, so maybe Filecoin makes its way around the world and so you have people using Filecoin, or people having Filecoin as an investment. Once the file coin network comes online, you have people who are incentivized to set up these nodes,

and the nodes have an economy that is backed by Filecoin and it becomes like a self-fulfilling prophecy, because they architected the distribution of the coins well enough.

It's so hard to predict how these things will play out, but I can understand the high speculation and the high anticipation of Filecoin, just because of the quality of the core technology and the, I guess the sophistication of the team in terms of how they know the network effects need to develop. I don't know. I don't have any concise thoughts there, but.

[0:30:21.5] BFC: Yeah, I mean, I think you bring up network effects and that's an important point. I think if the token is a key way to create network effects, then that may well be a totally legitimate and strong use case for token. Yeah, I think if that's the case, if you have this token and the token is going to be the key incentive mechanism to create these massive network effects, well fantastic. Then perhaps there is really a big use case for it. I don't honestly have an opinion on whether that's the case with Filecoin. I don't understand that project well enough, but maybe the case.

[0:30:57.8] JM: Yeah, likewise. Yeah, likewise. Well I'll have to ask somebody from that team about it. Let's talk about more tangential things, or tangible things, I should say. Bitcoin and Ethereum, you have dove deep into both of these communities. How would you describe the differences between the Bitcoin and the Ethereum communities?

[0:31:18.1] BFC: Sure. I mean, I think the Bitcoin community, they have mostly been interested and captured by this idea of global decentralized money and this digital gold and this cipher punky ideas. Maybe at some point, it was a little bit more diverse and there were other people who were less focused on just that, but still part of the Bitcoin community. I think those people probably left for the most part and gone through Ethereum or gone on to do other things.

I think at this point, the Bitcoin community is very, very focused on that particular use case. It's also very political community, very libertarian, very anti-government, very radical, I think. Then the Ethereum community it's just much more open-minded, I would say, much less ideological, more practical, more pragmatic, maybe don't have such strong shared values. I think that's how I see those two communities.

[0:32:23.8] JM: Why did the different sides of the Bitcoin community emerge in this huge rift around block size?

[0:32:30.7] BFC: Yes, that's a good question. We have done many podcasts about this. Well, to me it doesn't exactly make sense, because for me I always understood this core Bitcoin, digital gold, value proposition, it made so much sense to me. This is actually a big reason why I initially got interested in Bitcoin. That being said, I was also very interested in other applications, then I had absolutely – Ethereum was great, etc.

With Bitcoin, my eyes it made a lot of sense to increase this block size and to bring on more capacity and thus have more users. With Epicenter we've been running a business for years and we would accept Bitcoin from advertisers who pay our people in Bitcoin and that worked fine, and then at some point it stopped working, because transaction cost $30 or $50, and if we had to pay or designer in India in Bitcoin, that just made zero sense, right? We had to actually stop using it, or move to Bitcoin Cash partially. It was highly irritating.

It was like if you're using Bitcoin, this seemed such an obvious thing to me and it seems like something that shouldn't be a political thing, but more a question of what's the right choice? I honestly do not fully understand why there's been this opposition to increasing the block size to some extent. Then I think what happen is just that we had to split and we have these different ideologies and camps and I think they became entrenched. In the end, I think this actual issue that was just being discussed was almost a non-issue. It's a weird thing. I do not have any entirely satisfying answer of why it went that course.

[0:34:13.9] JM: Yeah, I need to interview somebody from Blockstream or a lightning network company about this, because I'm equally confused. I just did a show with Roger Ver and I was talking to him about this. I mean, I guess I can understand it from the standpoint of if I was to try to give the strongest argument for the smaller block size is that you could imagine a world where everybody wants to have a full node that runs on their mobile device and it's connected over lightning network, but I don't know, I'm not enough of an expert to really understand why that will be useful.

Do you do you have a sense of the state of lightning network development? Is there some reason to emphasize smaller blocks for the sake of the lightning network?

[0:35:03.2] BFC: Well, so we did the first episode about lightning network, I guess when that white paper came out which was three years ago, or something like that. Even at the time, actually we talked about the block size in that episode, I remember that. Because one of the things was lightning network is that the security of you having Bitcoins on the lightning network actually depends on you being able to close the channel and create a transaction on the main net. If you have full blocks on Bitcoin, then it can get difficult to close up your lightning network channel. It actually becomes less secure and less usable, the lightning network.

[0:35:39.5] JM: It becomes less usable if you have big blocks?

[0:35:41.5] BFC: If you have small blocks, right? Because if you want to – first of all, opening a channel cost more money. Second of all, closing a channel costs more money. Third of all, you have a time limit, sometimes to close a channel and to get your money, so if you can't close a channel in time, somebody can potentially steal your money. If you have full blocks and you have to wait for a long time, lightning networks can become insecure.
We talked back then with the authors of the white papers. There was Joseph Poon and Thaddeus Dryja, and I think they actually agree, you need bigger blocks for the lightning network. I don't think there's any reason why the lightning network implies that you shouldn't have bigger blocks.

Of course, it is true that you have to have some demand moved to the lightning network, so overall it will decrease the necessity of doing on-chain transactions. Even for the lightning network, I think bigger blocks that aren't full would be much, much better.

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[0:36:45.1] JM: Software workflows are different at every company. Product development, design and engineering teams each see things differently. These different teams need to collaborate with each other, but they also need to be able to be creative and productive on their own terms.

Airtable allows software teams to design their own unique workflows. Airtable enables the creativity and engineering at companies like Tesla, Slack, Airbnb and Medium. Airtable is hiring creative engineers who believe in the importance of open-ended platforms that empower human creativity.

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[INTERVIEW CONTINUED]

[0:39:04.7] JM: Is there some set of vested interests that were able to shape the narrative here, because this is I think Roger's sentiment is that there are these vested interests and the coin

basis and the block streams of the world were able to shape the narrative, such that Bitcoin Core got to take the Bitcoin ticker, the BTC ticker symbol and run with it despite the fact that they didn't have a compelling reason to keep the block size small.

Then again, I don't even understand what their vested interest would be, why they will make more money off of this smaller block size. Do you have a sense of that? Are you a conspiracy theorist?

[0:39:50.1] BFC: I don't think it was about some secret business model for Blockstream or anything like that. I think to some extent it was just also about these different camps and this power and then it became for the core developers about, “Okay, no. We will not be coerced. We will resist, just because we can resist, and we don't want these companies or others with users to pressure us.”

The ironic thing is that even most of the blocks, we did podcast with Adam Back and Greg Maxwell and various people on that side of this debate, and they would all agree that yes, we should increase the block size, just not now and not this way. Then there may be some would say, “Okay, 2 megabytes a year from now, which may have been three years ago two years ago,” but then when the time came, again they would be against it.

I think it's a tragedy a little bit. I think for me, it certainly made very clear the importance of having processes for upgrading decentralized networks. I think these need to be explicit processes and the users of the network need to actually have a say and be able to execute this process.

I'm very interested in on-chain governance and using tokens for voting. I think that's a huge idea. I'm sure it's going to take many years for that to really mature and to work well, but I do think that that is needed. Yeah, I mean, maybe that there's some exception with Bitcoin and there's something to be said for being the chain that never changes. You know Bitcoin today is the same, or almost the same as what Bitcoin is going to be like in three years and ten years, because of course, if you have digital gold in mind, then that stability and continuity has value. I think for building technology and blockchain networks that are going to support many users, it's a terrible approach.

[0:41:50.7] JM: Didn't Vitalik and Vlad, who are guys that are pretty prominent in the Ethereum community, namely Vitalik who invented Ethereum, but didn't they both come out against on-chain voting?

[0:42:02.2] BFC: Yes, they did. Yeah, so they're against it. I think their argument is Plutarchy, and then if you have coin,

[0:42:11.8] JM: What's plutarchy?

[0:42:13.2] BFC: Plutarchy is the government of the rich and the wealthy. Of course, if you have one coin, one vote, somebody who has a 100,000 ether, with somebody has 0.1 ether, that one person has literally 1 million times to say in the system. If you have something like ether and you have voting with points, you will have a small number of people who have wales who basically would control the system.

I think that's absolutely correct. Now the issue is of course, now you also have a small number of people who control the system. Those are Ethereum core developers, of course Vlad and Vitalik being two of them. I think, sure their intentions are genuine and they think it's better for Ethereum and they may well be right that Ethereum is a little bit like Bitcoin, it's become a big system, a very valuable system, so it shouldn't do those experiments, but it should progress slowly. Probably it does not make sense for Ethereum to implement on-chain governance.

If you set up a new system, I think there's going to be so much innovation coming out of on-chain governance out of those votings. Of course, the powerful thing is that you can always fork the chain and you could cut out those wales. If you feel they act against the interest of the users, like someone who can take the chain and just say, "Okay, well your voting power is gone. We're going to launch our own network, we're going to distribute the coins in a different way," so you do have a powerful checks and balances in these systems. I think it's the right direction to pursue. I think we're going to see a lot of interesting things coming out of on-chain governance.

[0:43:49.1] JM: I wonder if, as applications get built on Ethereum, to what degree forking and building a new blockchain will remain feasible? Because you can imagine if somebody forked

Linux and made Linux non-compliant with a bunch of applications built on top of Linux, well probably the operating system would not see as much adoption. I mean, I guess that's a side point to the argument we were just having, but it was something I just thought of how much leverage will people have in the future as more and more infrastructure gets built on top of the core infrastructure we're getting today?

[0:44:27.5] BFC: Yeah, that's a good point. I think forking can become difficult at some point and yeah, I think it will depend a lot on the application. Of course, that provides some balance again that it's good that there's some threshold, it's good that isn't just super easy to cut out other people and wipe out what has been built up. You're right that if you have this base layer technology, that becomes very entrenched, maybe forking and changing the distribution, changing those things would become very, very difficult. I understand those arguments. Of course, then I think what's super important is the distribution of those tokens. I think then having wide and fairly egalitarian distributions will be valuable.

[0:45:11.0] JM: One thing I find interesting about the Ethereum versus Bitcoin community is that Ethereum's solution to scalability is I would say more ambitious than Bitcoin solution to scalability. I think Ethereum, they're not opposed to lightning networks. They will have ideas that are like lightning networks, but Ethereum is more pursuing this proof of steak avenue. Then they also have these – I talked to Christian Reitwiessner I think, about this other – what was it?

[0:45:44.0] BFC: Plasma?

[0:45:44.7] JM: Plasma. Yeah, where you have these trees of blockchains. These ideas are really cool, they're not exactly proven. Casper for example provides a rollout plan for proof of stake. Do you have a sense for how much progress has been made on the Ethereum scalability side of things?

[0:46:05.7] BFC: Yeah, we actually just did a podcast about this a few days ago with Karl Floersch. He's one of the people working on all of those.

[0:46:12.1] JM: Yes. Karl's the best.

[0:46:13.5] BFC: Yeah, he's cool.

[0:46:13.9] JM: I love Karl.

[0:46:16.6] BFC: Yeah, so I mean, my impression after that podcast was that actually the Ethereum scalability roadmap makes a lot of sense to me. I think it's very reasonable, it's well thought out and it feels to me that it actually has a good chance of succeeding. Now of those three things, so I think there's three key parts of it; one is proof of stake, the other is plasma and the third thing is sharding.

Now of those three things, sharding I really do not understand. We did do a podcast with Vitalik once years ago and try to explain it and I still didn't understand it. However, plasma seems actually pretty straightforward. I think that's totally going to work. I don't see any reason why that wouldn't work. The proof of stake, the Casper stuff, it doesn't look as trivial as plasma, or as simple as plasma, but I still think that they're going to, I think overall confidence is high that they will get this to work on some semi-reasonable timeline.

I actually think that Ethereum has a good roadmap, a good plan and that they will be able to execute that. If they, do maybe they have a chance of really having the space chain and then lots of plasma chains and being able to support a huge amount of applications.

[0:47:30.0] JM: Plasma chains, those are like application-specific side chains?

[0:47:34.9] BFC: They could be application-specific or they could not be, but they are basically side chains. The idea here is that the security is still guaranteed by the main Ethereum chain, but that you can then run computation and move tokens to sidechains and maybe the sidechains among each other would also be interoperable and could be configured in different ways.

It's actually similar to the original sidechains vision that Blockstream people published. Of course, Cosmos which I used to work on and still work on, it's a similar relation. I think this many chains being interoperable, like that is going to happen and it's going to work and it is going to bring a massive amount of scalability and interoperability to the blockchain world.

[0:48:24.1] JM: Do you think it'll lead interoperability between chains effectively, or do you think that's going to be dependent on the other chains, like will Bitcoin need to make certain adaptations in order to have significant interoperability, or what do you think the interoperability between currencies story will look like?

[0:48:43.3] BFC: Yeah, so of course with Cosmos right, so people – I think I saw you had Ethan Buchman on, so people will probably have some familiarity of Cosmos, right?

[0:48:51.7] JM: Yeah.

[0:48:52.1] BFC: Cosmos also the idea is that you're going to have this bridge to Bitcoin, so that you'll be able to basically lock up Bitcoin and move it to another chain and then use it on the other chain and at some point move it back to Bitcoin. Now the challenges with Bitcoin has a very limited capabilities of holding these Bitcoins in escrow. The only thing you can really use for that is multi-sig at this point and multi-sig is not good solution for that. It's not going to work well.

However, the blockstream guys and a lot of Bitcoin guys are very interested in this thing called Schnorr signatures, and I actually don't know much about it, but I think that should actually enable having those pegs as well to Bitcoin. I think probably in the long run, even Bitcoin will be connected to that and then when it comes to Ethereum or smart contract chains, I think it would be fairly easy to connect all those chains. I do think we are going to see an internet of blockchains.

[0:49:46.2] JM: Talk a little bit more about Tendermint and your involvement in that project.

[0:49:49.9] BFC: Yeah, as I mentioned before, I was working for Monex in 2015 and 16 and Monex is doing decentralized chains and they started with an Ethereum fork, and they wanted to have an Ethereum in private Ethereum chain. Of course, you can't use proof of work, because it doesn't make sense for all those consortium members to do mining.

The Monex guy, team discovered Tendermint, and so let's use Tendermint. Then Ethan, he was working at Monex at the time and he started to work on Tendermint as well and building

Tendermint. Then I joined Monex and we were basically trying to build and sell these applications, and press applications based on Tendermint.

Tendermint is really just, well again, people probably check out Ethan's podcast, it will be much more thorough explanation, but it's just a – it's a very simple consensus algorithm that allows particular number of parties to come to agreement about the order of transactions. Yeah, then they were started on Cosmos, and I joined Cosmos in January 2017. It was a few months before the token sale and I was just the first non-developer at that time and I was working on that fundraiser and scaling that company and basically realizing this internet of blockchain, a Cosmos vision.

Then I was working on that basically until the beginning of this year. Then I've left. Since then, I've started building a new company called Course One, and our focus right now is to run infrastructure for blockchain networks, and particularly to run validators for proof of stake networks. We are right now basically working on running some of that infrastructure of Cosmos once that network launches.

[0:51:34.9] JM: Tell me more about that. What does that mean that you're running validators for networks? Does that mean your infrastructure provider, so if you're – if you want to spin up some application-specific blockchain and you want additional validation infrastructure you provide that?

[0:51:55.4] BFC: That could be one thing, but actually did the simple thing first it's just that that the token in Cosmos is called Atom, so there's the staking token. The idea of Atoms is that you can use Atoms to secure the network. Atoms is a little bit like hashing power in Bitcoin. Let's say you have 10% of the Atoms, it's a bit like having 10% of the hashing power in Bitcoin.

You can vote on the validity of blocks, you can participate in governance and those kind of things. If you're an Atom holder, you can basically say, "Okay, I want to participate in this process. I'm going to use my Atoms in this way, and I'm going to earn a block reward and transaction fees," just like you could by running a Bitcoin miner.

However, you as a for example a normal Atom token holder, you won't be running that node that has this high availability node and highly secure, and signs of blocks and all of that stuff, but this is a function a little bit like a mining pool. Someone who basically joins that voting power from the different miners, or in the case of Cosmos, so it joins that voting power from the different tokens and simply produces blocks, validates transactions and runs the consensus process. That's the function that we're building.

[0:53:13.0] JM: Is it hard to start a company around that's involved – heavily involved in cryptocurrencies in this climate, this regulatory climate?

[0:53:22.1] BFC: Well, I mean, starting a company is very simple. You just start a company. Of course, the question is how is this going to be treated once it's launched and once its live and once we run the service. You are right that it's a bit unclear how the service of validation and running these proof of stake networks will be treated by regulators. We think that it should be an unregulated activity and we have spoken with lawyers about this, but that remains to be seen and to be honest, we'll have to deal with the problems as they arise, if they will arise.

[0:53:56.2] JM: Okay, so Tendermint provided some infrastructure and algorithms for this Internet of blockchains. Ethereum has some space of internet of blockchains potential if the plasma and Casper projects pan out. Is this a winner-take-all internet of blockchains world, or do you envision a world where you have Ethereum and then you have this network of blockchains built around Ethereum and you have a more generalized blockchain network perhaps that can evolve with the Tendermint style blockchains the Cosmos network enables and you just have these different blockchain networks interacting with each other, or do you think there will be a winner-take-all? How do you think this will look in the scheme of things?

[0:54:50.2] BFC: I don't think it's going to be winner-take-all. I think many of these approaches may pan out and they have different pros and cons. For example, if you compare plasma and something like Cosmos, then with Cosmos if you run your Cosmos chain, then you can have your own governance and your own distribution of the staking tokens, you can have your community that really controls fully that chain.

Whereas with plasma, the idea is that you're inheriting the security of Ethereum, the root chain right, so you don't have that same level of control. I think those are different approaches. Now some applications may not care, but they will go in either one. It may be a winner take much, I don't know, or it could really be just a wide variety of blockchains used in for slightly different use cases, slightly different applications. I do think there's going to be a column solidation and maybe we will have three, or four, or maybe 10 blockchain networks, or types of blockchains. I don't think it's going to be a hundred.

[0:55:53.5] JM: Yeah, there's a lot of topics I wanted to continue to explore with you, unfortunately I'm almost out of time. We should definitely do another show in the future. I'd love to have you back on. What are you focused on right now with Chorus? What's the roadmap?

[0:56:06.5] BFC: We've been focusing on hiring primarily, so we hired our elite developer, we hired a researcher to really understand a lot of these new protocols coming up and the dynamics and the economics and what is it like to run a validator in those. That's what we're working on. We're still trying to hire a DevOps person, a DevOps engineer, so we were almost basically built the initial team. Now we're working on building that initial product. We want to be live when Cosmos goes live. We have the genesis block of Cosmos, like be there running that validator.

Then the next strings will be too look beyond that, whether that's maybe running different Cosmos chains, or maybe we're going to be running a validator on something like [inaudible 0:56:53.2], so some of the other networks coming up. Yeah, that's the roadmap, at least for this year I think that will be what we'll be focusing on.

[0:57:01.6] JM: Are there are a lot of applications on that Cosmos network?

[0:57:05.1] BFC: I mean, right now it's not live yet, so there's none. There is a decent amount of interest. In particular, one of the things that you'll be able to do in Cosmos, there's is thing called ether mint. Ether mint is basically the Ethereum virtual machine running on top of Tendermint. That means it's like you can run the exact same applications in Ethereum, except much faster and much cheaper.

What we can have in Cosmos is that you have this Cosmos hub and then connected to it. You can have one of these ether mint chains, or maybe many of the ether mint chains. If you have that, the nice thing is you could literally just take an application that runs today on Ethereum and you can port it over there and you will have – you can reuse your code and reuse your UI and it would be extremely easy to do that.

I think it may well be, or it's likely that this is going to be ready before the plasma chains. In that case, we really may be able to scale Ethereum in Cosmos earlier than Ethereum can scale Ethereum. If that succeeds, then I think there could be a huge amount of demand, because there's so many projects today that basically built their application for Ethereum.

It works, but it doesn't work because the gas cost, the transaction fees in Ethereum is so high and the capacity so low. They're waiting for better Ethereum, or more scalable and cheap Ethereum to come along. I think there's a real chance that the Cosmos may be able to do that. If that happens, then I think there's going to be – you have a very large demand, at least for data aspect very soon.

[0:58:41.0] JM: Brian Fabian Crain, thanks for coming on Software Engineering Daily. It's really great talking to you.

[0:58:44.7] BFC: Well, thanks much for having me, Jeff.

[END OF INTERVIEW]

learnings of the ThoughtWorks engineering team, who have talked about building the product in previous episodes of Software Engineering Daily, and it's great to see the continued progress on GoCD with the new Kubernetes integrations.

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