EPISODE 643

[INTRODUCTION]

[0:00:00.3] JM: A token is a unit of virtual currency. Most tokens are built on a blockchain-based cryptocurrency platform, such as Ethereum. Building on top of a platform like Ethereum allows these tokens to form their own financial ecosystem while leveraging the scale of an existing currency. Tokens became highly popular in early 2018 with the boom in ICOs, Initial Coin Offerings. Many of these coins offer a value proposition of a “utility token.” The idea of a utility token is that the token is necessary to transact in a particular ecosystem, so that in order to get a transaction in that ecosystem you have to buy the token that is necessary for the utility exchange within that ecosystem.

For an example, let's say Amazon decided to create their own token. If Amazon were to require you to transact in their Amazon coins, that would require you to convert US dollars to Amazon coins in order to buy items on Amazon, and the Amazon coin would be the utility token. The utility being you would be able to buy items within the Amazon ecosystem.

There are many different kinds of utility token schemes. Time will tell if this model makes sense for the cryptocurrency investment landscape. How it has been used today is the ICOs get issued and people buy these utility tokens. Today they don't have any utility, but the promise is that someday the ecosystem that you're buying into will have enough transaction volume and enough network effects to give that token some actual value beyond purely speculative value.

Another type of token is the “security token,” in which a token represents a share in an organization. This token type is more like a stock, or a bond, or a certificate of ownership, or of a financial instrument. These types of tokens also have their share of criticism. If I start a company today, most of my assets are not represented on a blockchain. I can't represent them on a blockchain. These are assets like hiring contract and intellectual property and real estate. The legal ownership of these assets is settled by a complicated legal system which has no notion of a blockchain, so it's unclear how the claims of a security token today would be enforced, or why a security token is actually a better option for raising capital than traditional equity or debt instruments.

As we've seen, the tokens and the models for token issuance are very immature. Felipe Pereira is the author of On the Immaturity of Tokenized Value Capture Mechanisms, which is a Medium article in which Felipe documents different types of token systems, including several flavors of utility tokens and security tokens. He's also co-founder at a company called Paratii.

He joins the show to discuss the present viability of token-based systems and what blockchains have actually proven to be useful for today. We had a great discussion about the usefulness of blockchains and what's truly been proven to be useful and what is still up for debate.

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[INTERVIEW]

[0:06:00.7] JM: Felipe Pereira is the Co-Founder of Paratii and he writes on Medium about cryptocurrencies and blockchains. Felipe, welcome to Software Engineering Daily.

[0:06:10.6] FP: Thank you very much, Jeff. It's a big pleasure to be here. I'm a big fan of the show.

[0:06:15.8] JM: Thanks for listening. You wrote this article called On the Immaturity of Tokenized Value Capture Mechanisms. I thought it was a pretty good explanation of are these different token types valuable, or is any of this stuff valuable at this point? You really explored the question of value. That's what I'd like our conversation to focus on is token types and the nature of what makes something valuable ultimately.

I want to start with a more contextual question and a contemporary question. Why even talk about this stuff in 2018? Isn't it too early? Haven't we determined at this point that crypto is a big scam, all the ICOs are scams, none of this stuff works at scale, Bitcoin centralized, Ethereum's like almost decentralized. Why are we even talking about this stuff right now?

[0:07:07.9] FP: Yeah. We definitely have come to some, I wouldn't say conclusions, but to some clearer thoughts on tokens throughout the past year and this year. You're completely right

when you say that there's a lot of stuff out there that maybe shouldn't even be launched, or maybe shouldn't even be tried in the open market.

I guess, to be clear, or at least in my mind, there's two big use cases for cryptocurrencies that have been proven. One of them is the insatiable store of value use case, which is what Bitcoin has been doing for almost 10 years now. That's useful for the world and for society. People in a lot of countries that suffer with hyperinflation are actually running to Bitcoin to preserve their wealth and to be able to transfer it to other people around the world. That's a checkbox there.

Then I'd say that the second case that has been working is that of fund raising. When Ethereum came and people started doing this ICOs all around, it has grown and became a bubble, but it's clear for me that we've moved towards more scalable maybe model of crowdfunding, and a model that allows investors all over the world to invest in projects that they believe in, regardless of their level of accreditedness, or level of sophistication as investors.

Being on the store of value in the fundraising use case, I agree with you that it's mostly speculation at this point, especially because networks are still on their very early days. I do think that among some of the models that have been tried for tokens, which are basically digital assets, I do believe that some of them have a high chance of accruing value and of actually opening up, or paving the path for the third and the fourth big use cases for cryptocurrencies, which we haven't seen in scale yet, but I'm hopeful we will come to see them next years.

[0:08:56.2] JM: I'm actually going to articulate three more use cases that I think have been proven and I want to get your feedback on it. The other three use cases; first, there's the digitization of unique objects on the internet, or the verifiably unique digital objects. There are mechanisms, the whole thing that came out of CryptoKitties and why Andreessen Horowitz put a bunch of money into the CryptoKitties' founders is because they brought to market the functionality of having a provably unique digital asset.

Like if you pick up a sword in a video game, you can now prove that this is the only sword that exists. That's obviously, it's being applied to gaming, but it's pretty easy to think about ways in which having a provably unique digital asset could be valuable. The other thing that I think is interesting is the idea of a blockchain is a distributed consensus mechanism, and that is novel.

Even just as a computer science concept that we don't maybe even have a widespread use case for yet, unless you count the things that you just enumerated already. Even if you just look at it as a fundamental computer science concept, that is a breakthrough and that is a tool in the computer scientist's toolkit.

The third thing that you didn't mention that I think also has not been proven, but is sort of proven is the digitization of the contract. Right now, my digital contract experience is I get a PDF in an e-mail from a lawyer, or from somebody I'm making a deal with. It's like, is a PDF really the way that we want to describe something that should be well-formed and well documented? I think the idea of a smart contract, where you have a digital rule-based unambiguous contract that is another potential breakthrough that actually depends on the same things that the value, that uncensorability and the distributed consensus mechanisms, the things in the purposes one through four of crypto. I think, I want to hear your feedback on that, but if you agree with those, that's five use cases for blockchain-related technologies.

[0:11:10.0] FP: Yeah. I would say I completely agree that they are use cases. I wouldn't agree that they are proven yet, I guess. Mostly because we haven't seen growth in user bases, like even for CryptoKitties, I'm not sure of the data exactly, but I would suppose or guess that if you go to analytic sites and check how many daily users actually exchanging kitties are playing with them, even if you count all the applications built on top of the original CryptoKitties, I wouldn't say there's more than a thousand people every day around the world playing with it.

Of course, it's still early and these investors are all making bets. I'm also bullish on the digitization of property basically, not only in the case of collectibles in games, but also in the case of property, real estate and many other cases.

When it comes to decentralized consensus, yeah, that's a big breakthrough I guess, and we've seen with witnessing the birth of new families of protocols, which try to tackle the issue in different manners than Satoshi did in the beginning. We're starting to see a lot of tradeoffs become more clear and clear, in the sense that we can be, or we can build protocols as decentralized as we want, in the sense that we will have to pay off some security, or some scalability to reach that decentralization and we can balance this trade off in multiple ways. I agree that that's a powerful new concept in the computer scientist toolbox.

When it comes to contracts, that's I guess the most delicate thing. I don't really – personally, I don't have many problems with signing stuff on PDFs, although I'd like them to be, I don't know, more automatable, or maybe more easy-to-use, or I don't know. When it comes to smart contracts in Ethereum or any other platform, first, we don't really have an ambiguous contracts yet. I mean, stuff happens as the code determines it should happen, but in the end of the day we're talking people making interpretations of things. Even in cases where contracts work exactly as they should have, like in the case of the Ethereum DAO, the DAO, people might just gather and say, "Hey, actually what we wanted was not exactly." We're still not at the point on which we can have a truly code is law constitution, even for small communities, I guess.

Of course, I'm a fan of the possibility of signing a contract with people anywhere in the world, making automated escrows and making value programmable. Like when it comes to contracts specifically, I always to cite a very simple example that I've seen one of these days, which is a very simple contract for friends that RSVP'ing into a party.

Say you are a guy and you're bringing a lot of people to your house, you invite 20 people, everyone RSVP's to this party and everyone puts one ether or one small token in this contract. Then when people come to your house, they just check in in your cellphone, prove that they're there and they get their token back. If you have friends who are not good enough, or close to your heart enough and that don't show up in your house, everyone that showed up is going to get a little piece of the token that this guy who confirmed they did show up, actually is losing. That's very simple, almost dumb, but it shows a novel coordination mechanism. I think that's where the power of contracts lie.

[0:14:28.3] JM: I love that example. I hadn't heard that one before. That's a really good simple example. Because it's like, you need to put up some resources just to put together a party, hire a DJ, buy some chips and dip, buy some pizza. If the party organizer organizes a party for 50 people who confirm on Facebook and those 50 people have no skin in the game, maybe only get 15 people, and you've ordered way too much pizza, you've hired a DJ for 15 people and you don't enough people to have a good dance party. This escrow mechanism serves a great purpose.

Then I guess, the value comes from describing in a contract as a – like you could do this through Venmo, but because it's a well-formed, but yet strange transaction mechanism, it might be made easier by just having the system where people just check in and you have this automated value transfer that occurs upon the check-in. That seemed like a good example of something where the difference between using the party, the contract for the house party is significantly simpler than just using Venmo, or Paypal, or whatever other centralized payment mechanism.

[0:15:45.5] FP: Yeah. These are the cases we should be looking at, I guess. Circling back to the three examples you brought; digitization of objects and decentralized consensus and contracts themselves, just going back to the token side of things, I don't – I'm not convinced that any of this three inherently need a token to work, either digitization of objects or running contracts, which you can do on existing platforms, or even the centralized consensus, which you can now also piggyback on Ethereum or other platforms. That's what I wanted to mean when I said that surely, these are big use cases, but maybe not for tokens.

[0:16:23.2] JM: Just to go a little bit deeper on what you said about like the PDF contract versus the digital contract, the value of the PDF contract is in some sense the ambiguity, humans – we don't want to enumerate every edge case, and so if you have a complex contract you're trying to draw up, it may be worth it to leave some ambiguity in the contract. Whereas, a digital contract, a blockchain-based contract has no ambiguity. It's extremely explicit.

I think in crypto, you actually see this tension between ambiguity and specificity explored not just at this PDF versus digital contract level, but you also see it in the governance level where you have some people who are fans of completely the on-chain governance model, where everything is laid out specifically on-chain. Then you have the counter – the other political side of it that says, “You know, this is too complicated, right? It's too ambiguous. We don't know how to build a blockchain and therefore, we shouldn't have governance be this on-chain model.”

I didn't plan to discuss this with you, but maybe could you talk about the on-chain governance versus off-chain governance? Am I capturing the two sides of that debate correctly?

[0:17:40.4] FP: Yeah, I guess so. I think you've pinned down things when you said that digital contracts leave less room for ambiguity. You're right when you mentioned that on higher levels, like when it comes to governance and to the people governing these networks, there's a lot of ambiguity actually and there are some bad intentions, and sometimes in misinforming people.

Why do I say that? This whole movement began in well, I mean, the crypto movement began in 2018 or 2009 with Bitcoin. It was really pushed by the wish of Satoshi, or by the desire of this community to create an alternative to the financial system that was completely open and completely decentralized and completely uncensorable. It made sense to pursue fully fledged decentralization in that case.

For a lot of other use cases where blockchains or cryptocurrencies might be useful or helpful, you don't actually need 100% decentralization in a network in order to make it more valuable than the traditional alternatives. For example, the peer-to-peer file-sharing history is full of examples of networks that try to be more or less decentralized and that played a lot in this trade-off between scalability and the centralization and security.

In the end of the day, I had the feeling that users always flocked to the systems that were the last decentralized as possible, which is a lesson to us. When you look at the evolution of Napster, Freenet, Torrents and everything, you don't need to be fully decentralized as you need to provide an experience that's better than the one that your users had before, and also give them more value. I think that the key here is actually on value.

On public blockchains today, you see a lot of this discussion going on, like we see Ethereum striving to be as decentralized as it can, but with a caveat that it still relies on a very influential leader, then we see other chains that are paying off in decentralization from day one in order to achieve higher scalability. For example EOs. It's all still a big question mark. We're not sure yet which applications will actually require the level of decentralization that Ethereum aims to provide and I'm not sure of which applications are actually going to work fine with the level of decentralization that EOs is going to provide. I think that more important than trying to get things black-on-white, right or wrong is to actually understand the subtleties in these trade-offs and to examine case-by-case.

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[0:20:15.2] JM: At Software Engineering Daily, we have a web app, we have an iOS app, an Android app and a back-end that serves all of these frontends. Our code has a lot of surface area and we need visibility into problems that occur across all of these different surfaces. When a user's mobile app crashes while playing a podcast, or reading an article, Airbrake alerts us in real-time and gives us the diagnostics that let us identify and fix the problem in minutes, instead of hours.

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Thank you to Airbrake.

[INTERVIEW CONTINUED]

[0:21:34.9] JM: The one other thing before we get to your article, I guess we're in a time where everything is political. I have just been surprised by the politics of there are people who will just be completely dismissive of cryptocurrencies in blockchain technology. Still, even still, I got an e-mail yesterday and I don't mean to be throwing this listener under the bus, because I've gotten other e-mails from listeners like this who are like, "Why are you covering this technology?" It's like there's a active resistance for people accepting that this is potentially useful technology, or proven useful technology.

I think it's proven that it is useful at this point. Obviously, we've talked about uncensorable cryptocurrency, that was the first thing you mentioned when in fact it is censorable, because if 51% attack could be conducted by Bitmain today. Even if you just consider it a prototype, it's a very successful prototype today. It's extremely successful prototype. I see people e-mailing me.

You also see people like Vint Cerf. I saw Vint Cerf tweet, this slide it was him presenting something and there was a slide that he was presenting that was one of these sarcastic flowcharts, where you have just two things in the flow chart, two places in the flow chart and an arrow from the first one and the second one. The first one is, “Do you need a blockchain?” There's an arrow pointing to the next place in the flow chart and says, “No.” The idea being you never need a blockchain for anything.

Maybe that's true today. Maybe we don't really need a blockchain for anything today. If we just cloned what Bitcoin is in actuality and it was on AWS instead of on Bitmain’s servers, that would be – we would probably be thinking of that as more centralized, even though that would just basically be the same thing rebranded.

The thing is I just think the optics there specifically, like Vint Cerf works at Google. I think this would like be if Microsoft 1995, earlier than 1999, because I think in 1999 the open-ended that was proven, but 1995 things like MSN and AOL were still like, “Oh, this is the internet. We're using the internet.” It would be like, if Microsoft or AOL in 1995 would have said, “Do you need the open internet? No.” If they would have presented that flowchart.

It's really surprising to me how dismissive this attitude is. From not just the people e-mailing me, because they're unfamiliar with blockchains and they're like, “Why is this important?” Something like Vint Cerf, I think Vince Cerf is one – I don't know if he's won a Turing award, but I think he invented TCP/IP, so – maybe he's smarter than I am and I'm completely wrong. Just I am surprised by the politics and the dismissiveness of in this case, a complete incumbent.

I know Vint Cerf is a researcher guy that is just probably gets a great salary to hang out at Google, but he basically gets to operate as a researcher. He probably doesn't really feel he is a Googler. Even just the optics there of like, you don't need a blockchain for anything when blockchains are in the most grandiose sense of the vision, potentially disruptive to a business like Google.

[0:24:48.9] FP: Yeah, you know what's curious? I met Vint two years ago in a conference and I sent a question to his panel on blockchains. What are you guys are doing – at Google doing in respect to this technology? What's your vision in relation to it and so on? He gave an answer

pretty much along the same lines of this slide pretty radical. Not much have changed in the past two years for him, I guess.

I of course respect him a lot. He and Bob Kahn invented the TCP/IP protocols. He's right when he says that you don't probably need a blockchain for most use cases when it comes to teams developing something together today. The fact is that this is still a big research and development experiment, just like TCP/IP spawned a lot of research and experimentation with the internet back then.

Yes, we have some proven use cases and I think that part of dismissive attitude from these guys, comes from the fact that the ecosystem is still very, very much unregulated and very, very much heterogeneous. On one side, you have teams that are super, super full of integrity developing cutting-edge, very useful technology for privacy preservation, for example. Then on the other side of the spectrum, you have this huge teams from crazy places around the role, raising big amounts of money to actually deliver products that either don't work, or are not useful, or just not comprehensible, or not needed now.

We're still finding our North here when it comes to research and development. When it comes to decentralized applications, which are another thing we can come to talk afterwards, we still didn't have our iPhone moment. We still didn't have this moment on which a certain application clicked for critical mass of users and then that achieved a tipping point and started to generate enough network effects to grow and maintain itself. We're still looking for that.

It might happen in some different forms, I have some ideas, but until that happens and this whole energy that's being dedicated to research actually concentrates on the one, two or three paths that yeah, we're seeing that provide clear value, I think that that dismissive attitude is going to be less radical, be less aggressive and so on.

It's just as possible that in three, four or five years, we're actually not talking about blockchains or cryptocurrencies that broadly anymore, and are actually restricting our talks to this one, two, or three use cases that actually matter, and then maybe the attacks and dismissive attitudes will be less common, I hope.

[0:27:22.5] JM: The potential for an iPhone moment, you said you had some ideas in mind of what might lead to the “iPhone moment.” What are those applications that you see as potential iPhone moments?

[0:27:35.3] FP: Yeah. I like to think a lot about user generated work. The web showed us that we can reward user-generated content, but we are all aware that users on social media, or every other kinds of social networks are doing lots of work for the maintainer of these networks, in the sense that they provide activities that these networks monetize by themselves and not necessarily reward the users. I think that social applications that somehow incorporate prediction markets, or some easier way for users to provide this work and be rewarded for it according to how much value they are providing, I think this can be one killer application in the near future.

For example, a Tinder for just analyzing stuff you receive on your feed and if you're good at predicting what other people will like, you're going to get rewarded daily, or something along these lines. I think there's potential in this.

[0:28:28.7] JM: That’s a great idea.

[0:28:29.8] FP: Yeah, and I'm also a big believer on digital assets and crypto collectibles. Maybe not in the way that they’re being marketed today, because we're still in the early days again, but I do believe in the potential of a world of games where you can take assets from one game and bring that to another game, or sell a sword from one game as you mentioned to a player that is actually going to build something completely different with that sword on another game and so on.

There are already projects that are doing some really interesting work on crypto composables, which is the idea that you can get these sorts of items, these sorts of assets and combine them to create something that's notable and scars as well. If you can apply that to an ecosystem that's not tied to a single game, I think we're going to see some really amazing narratives in that sense.

[0:29:17.1] JM: I love the idea of the Tinder for content. Have you seen anybody that's working on – I mean, I've seen so many vaporware prediction markets and vaporware Facebook for crypto things. I mean, that seems something that could just exist today, or somebody could build that. If I understand your example correctly, the idea would be that you have people who are the curators and they're just swiping left or swiping right on is this content valuable? Then you need some reward mechanism. I guess, you could do something where people that actually end up reading that content, if they indicate that it's valuable either by reading that piece of content and spending enough engagement on the page, or by uploading it or something, then they could reward the people who swiped right on that piece of content. Actually, even just talking about them like, this is actually pretty complicated and swipe doesn't exist.

[0:30:12.7] FP: You're right. It's not that simple.

[0:30:14.1] JM: Subjective. It's ultimately subjective and probably subject to bot traffic and gaming the system. That's probably why it doesn't exist.

[0:30:23.7] FP: Yeah, you're right. It's not that simple. The first prediction market just went live on Ethereum, or the first prediction market on Ethereum, which is Augur. It's supposed to be a very simple prediction market, where you just post a question and people bet on outcomes for it, and it's already complicated enough. When you put UX on top of that, it gets more complicated. When you get the synchronization times you need to actually make the program work well, it gets even more complicated.

Yeah, there's really, really a large path between a great idea and a great product in this space. There is really a large amount of craftsmanship that's needed to cross this chasm. Of course, having better infrastructure is what we need to be able to experiment more freely in the application layer of things. While Ethereum is not scalable, how are we going to be able to think of an app where people can just swipe right or left and make quick transactions, or stakes, or whatever like that? That's not going to happen today. Unless, we're willing to pay off some decentralization and to move towards other pieces of infrastructure that can actually provide decent enough UX, or more scalability at this point.

Yeah, just to wrap-up discussion on this, there was an app that I really liked, that was called Hyper. I think it doesn't exist anymore, but it just gave me 10 amazing videos per day. I just told the app, if I like them or not, short videos, and then on the other day it gave me more 10 videos. That was it. I just watched it on the toilet in the morning, swipe left, swipe right and I always kept thinking like, “Wow, these guys are making recommendations out of this stuff that I'm telling them. These guys are using these to show to other people and to potentially earn money somehow. What if I could earn some of that back?”

Of course, when you abstract all these stuff, all the complexity away, that could come to be just an app with a wallet, where you choose if you like or dislike stuff, and then you get in the end of the day a message telling you how much money you made because of the recommendations. Again, you need a lot of infrastructure and we're still developing this infrastructure.

[0:32:23.3] JM: Okay. I didn't play in this, but to get into some of the discussion of the tokenized value capture mechanism, so you mentioned Augur. Prediction markets is just built with an ERC20 token. It's a tokenized prediction market?

[0:32:38.4] FP: Yeah. Augur has a dual token model, if I'm not mistaken. There is one token which you use to generally speaking and I'm not completely sure of this, but there's one token which you use to stake so that you can provide some attestation work to the network. There's other token, which is more like means of payment token. It's a dual token model and the model is called, or has been called that of a work token, because you have to stake one token, so that you can provide some work. Then if you provide this work well, you get more tokens back from inflation generally. If you provide the work badly, or if you do bad work, or if you try to cheat, the stake that you made is lashed.

This is the general idea behind this model, in the sense that if you're providing work to the network, you have to stake some tokens, so the velocity of the tokens is pushed down and then you always have that skin in the game and you're incentivize to provide the right work. That's how the general idea goes.

[0:35:33.5] FP: This space is very immature, just like the title of the article I wrote you mentioned. These token models are very immature. For most cases, we're not even sure if

they're needed after all. In the four or three years that took Augur from their ICO back then to launch, now they probably have come to conclusions that they didn't have back then, but they are already committed to all those investors. They have sold tokens to a lot of people, so they just have to push things in the way that they are.

I think it all comes back to the fact that again, as I was saying the beginning, for a lot of networks, a token is actually not needed and there's a lot of space for playing with crypto-economics, playing with incentives and doing all these stuff without a token in many cases. When there is a token, there's a strange duality to it, because participants who are hosting nodes in a network and providing services to it and actually ripping profits of it earning in tokens, they're interested in seeing this token increasing value, because then they're going to earn more for their work.

Participants who are actually buying this service from the network are actually looking for a service that's cheaper than decentralized alternative. They're actually looking for a tokens that's as cheap as possible. There's a strange duality there, and when you put in investors and founders that are of course looking to the appreciation of the token, but also to keeping a network that's healthy and that can provide services relatively low cost, it's a mess.

Tokens are, they come out really as speculative assets, they're freely traded in a liquid market where everyone can participate, where their utility is not there yet.

The point is if we commit to tokens early enough, and then sometime I had – we just realized that they weren't needed, what to do? Are you going to kill this piece of equity that you have sold investors, or are you going to push forward and try to eat the rate things and fix the Frankenstein product as you go on? It's a very, very delicate thing, because to exist in the first moment, most of these teams have to sell tokens, or have to sell something to investors, so they are just propelled to sell what everyone else is selling.

In my call here, what I would like to leave us a message is consider a lot whether you actually need a token or not, if you are creating one, or if you are planning on investing or using one, because some of the times you don't need that. If you come to realize that later on, and that's too late, you might be in trouble. which might be what you're trying to illustrate with Augur.

[0:39:39.7] FP: Yeah, Augur claims to do infrastructure for prediction markets, but they've put a lot of work on their frontend and on their actual product, like the software that people are downloading. There are some other projects which are really focused on infrastructure, in which the average people or the end-user might not notice that much about, but some of them are doing amazing work when it comes to token design and to actually providing a decent service that can be cheaper, or better than in the past days.

One example is Livepeer. Livepeer is building a network of video transcoding nodes. When you look at the pipeline to publish video on a self-publishing platform, or whichever online platform, video processing, which means getting the original raw file and adapting its bitrate, size, format so that it can play well on every device in connection, this work is super expensive for – well, it's a lot of the cost that YouTube incurs and that Vimeo incurs and other platforms incurs. Most of this work is outsourced to Amazon nowadays actually. Of course, this work is done by GPUs mostly, and GPUs are also being used to mine cryptocurrencies in a lot of places in Asia on so on.

There's a lot of research pointing towards the fact that if you get this GPUs, you can leave them mining whichever cryptocurrencies you want, and actually use their encoding and decoding chips with a very small increment in energy consumption, in a way that you can do a lot of transcoding while you're still mining with this GPU. This is not something a normal end-user would do, but Bitmain manager in China would probably be able to set this up.

What does that mean? Well, that if you get a lot of people, or a lot of machines providing this transcoding service, we can actually have a public transcoding network that's way cheaper than the service that AWS provides. In a way that YouTube, Vimeo, or whoever incumbent players can use it to cheapen their costs, but also people who are building decentralized or semi-decentralized applications can use in order to access this cheaper and uncensorable to save some service.

These guys have been doing a pretty amazing work at research development and implementation. In a little bit over a year, they went from the first prototypes to the main net and the protocols running on the main net. Now there's 10 transcoders shuffling workaround and 20

candidates for transcoders waiting in line to do so. The network is growing, not many people are talking about it. They have a token that follows a similar model than that of Augur a little bit more simple. They're not being traded in any exchanges or anything, like no shilling, no pump and dumps, and it's working. This is the thing I'm excited about following [inaudible 0:42:30.2].

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[INTERVIEW CONTINUED]

[0:44:22.9] JM: We just did a show about transcoding and how hard this problem is actually, because when somebody uploads a video, if you want to deliver that video to all these different surfaces, like if you want to deliver it to a smartphone on a shaky connection, but you also want to be able to deliver it in high-fidelity to somebody who's sitting on a T1 connection in their nice

apartment, you actually have to transcode it in multiple ways. Meaning, you have to compress it using different bitrate trade-off algorithms. There's a huge spectrum when you consider the different types of connectivity, the different types of phones people can be on, the different types of computers people can be on, you actually create this bitrate ladder, which is all of these different versions of the video that get delivered to the consumer.

This is just a lot of processing power that goes into that. This seems like something that could work, could make sense for it to be on the blockchain in order to decentralize it and make it cheaper and to make it a cloud service that somebody like Bitmain could provide. To the token point, the example you gave earlier with the house party, where we were able to enumerate an actual purpose for a smart contract, the thing is in that house party example, you don't need a token. All you need is ether, right? You just need a contract that exchanges ether.

It makes me a little bit suspicious of the whole utility token model, because if you just had a transcoding type of system built with smart contracts that used Ethereum, or that used ether, instead of using this token, then there's no reason why you would need this token-based network that you gave in the example of Livepeer. Although, I'll admit that the token is a nice way to bootstrap the network and raise some money for these guys and girls that are hacking on Livepeer and making it work. Cool, that's great. Let’s remunerate them for their efforts.

Unfortunately, if it works, somebody can just clone it to a contract-based system that just uses ether and doesn't use their token that only has one specific purpose. I mean, doesn't that seem like a counter-argument against even a token for this Livepeer purpose?

[0:46:45.6] FP: It does. I agree with you that tokens are first and foremost a great bootstrapping mechanism. There is the issue that if you have providers in one side and consumers on one side and consumers just go away, or just come down from a peak activity and there's very few consumers and you've grown to a large amount of providers and they're not going to be earning money, because there's less consumers now, block rewards or inflation can help maintain the network in that sense.

Inflation is one reason. Having the control over monetary policy of a given supply is one reason to have a known token. That can be good, that can be bad, that can be well-done or bad-done.

I'm not going to get into that merit, but I guess, it's one of the reasons. Of course, serving as a way to remunerate the teams that make these things is probably the biggest reason why we're seeing that many tokens out there today to be very frank with you.

Just when you say that anyone can fork the thing and just build a mirror-read system that works without a token, I guess that's the beauty of it. At any time, anyone can just fork the Livepeer network and build a clone of it. I bet that in one or two months, the original project is already going to be way farther ahead than the clone, because they just keep developing and delivering stuff, because they hold the token and because they are incentivized to actually keep working for the network, so that more people are going to use it, so that more tokens are going to circle around, and so that the tokens is going to increase in value.

Tokens are really good means of keeping a community together and making them work towards the same goal. Yes, sometimes you don't need them, but sometimes that can be very effective. Two very quick examples; one of them is Bitcoin itself, which well, the discussion of whether to have a token or not doesn't even apply here, but it illustrates the feedback loop that I'm talking about really well, in the sense that Bitcoin pays off rewards to people who help secure the network by mining. It pays off these rewards in Bitcoin, which is its unit of account.

The more people securing the network, providing work to it, the more robust the network gets, the more useful it gets, the more people tend to use it, the more people tend to demand Bitcoins, so the value of Bitcoins tend to increase. When the value of Bitcoin increase, the value of the rewards the network is paying to these miners, or to these workers actually increase since Bitcoin is its unit of account.

You have this feedback loop, where everyone is willing to provide more work, to read more value and to grow the network as a whole, which is possible because they are all around this very same asset. This is an example of this feedback loop I'm trying to illustrate.

Another example is that of Z cash, which I think is a fascinating example because Z cash has one of the most brilliant teams of cryptographers in the space, like real cryptographers, not just the crypto part of it. Z cash has a big founder reward. Meaning that at every block that comes to

this Z cash blockchain, a share of the new Z cash that's being issued there goes to the founding team, goes to Zooko, which is one of the founders on so on.

Recently, I've seen his data that shows that Zooko, Z cash is founder earns four million dollars a year per this founder rewards. That's a lot of money. That's a lot of incentive for someone to just go there and fork this network and say, "Hey, this is Z cash without the founders rewards." People have done this twice. One of these forks died, the other was actually converted into another fork afterwards that reintroduced the founder rewards. Z cash is still developing cutting-edge technology. I bet that most of its users were conscious about this, are just fine with the fact that Zooko and his team are earning money, because they're actually at the forefront of privacy preserving cryptography. Trade-offs, we have to balance them.

[0:50:33.3] JM: Totally. It makes me think of – I think there's validity in the point that you raise about hey, a token is a way of keeping a community together. Just like, yes you could fork this, but you're going to get – the utility keeps sub-projects together, just like equity keeps a company together. I'm sorry not the utility, the token keeps people together, whether it's considered a utility token, or perhaps a security token, maybe we could get into that in a sec, but it could just be used to keep people together. In that sense, it's very similar to the centralized company model.

Actually yeah, let's get into that. This idea of the utility token versus the equity token, or the security token I think as it's often called, so utility token we can say, okay, utility token would certainly make sense in the sense of – in the context of Livepeer, or in the context of Z cash, where the additional utility that you're getting, you're getting privacy by using Z cash, you're getting video transcoding, because you're willing to transact within this token, you're willing to exchange your highly-fungible currency for this utility token in order to play within this network that's providing some utility that you want, which makes sense especially in the context of what you just brought up, like the tokenization of it keeps people together.

Of course, the security token side of things is that you somehow replicate the model that we have with companies, where the shares in the company are represented by shares of stock and you replicate that by saying, "Okay, we're going to have some perpetual valuation mechanism

over this network, or maybe it's just a public valuation mechanism," and the security token represents some percentage of shares in that network.

Give me your perspective on the contrast between utility tokens and secure tokens. Do both of them make sense? Is there a purpose to have a security token and a purpose to have a utility token? Are there different networks that make sense for these different kinds of things?

[0:52:44.0] FP: Yeah. I guess, both have their own merits. I sincerely can't keep track of the changes in taxonomies, because every new day it's new words to describe these kinds of tokens. The way I like to –

[0:52:54.8] JM: Although, I'll just say you did your best to lay out all of these different words of your article, and I thought that was pretty useful. You've laid out 50 different subclasses of utility tokens.

[0:53:05.5] FP: I appreciate that. I was really happy to see that some VC funds have actually leveraged that diagram and actually built on it, there's new analysis and so on. Anyway, the way I like to think of it is that there's basically two types of tokens, or two types of crypto-assets; first is assets that represent something else. Second is assets, or are assets that have value by themselves. Security tokens are nothing more than tokens that are just there to represent something else, that they're not useful by themselves, but only when you count this something else.

A security token can be land property title, a security token can be a piece of equity in a token, a security token can be the ownership of an artwork, or anything like this. Whereas, if you take out this other thing, the token is useless by itself. A utility token on the other side, which then opens up the way for some of these models we've been discussing, our tokens that can bio services on specific networks and that can follow specific dynamics and that can accrue value in different ways.

I do believe there's a huge market for security tokens. The reason for that is that the securities market worldwide is worth, I don't know, 70 trillion dollars or something like that. The whole cryptocurrencies market today is worth less than half a trillion, if I'm not mistaken. What I'm

trying to say here is that when you look at the way that stock exchanges operate and that equity is issued and all the processes that companies have to go through in order to fuel themselves publicly, to fundraise legally and all this stuff, it becomes just so much easier when you can issue tokens that represent equity for instance on a public blockchain.

Of course, we still have to regulate that process, we still have a lot to regulate when it comes to sharing royalties, or revenue and stuff like that. It's just so much easier than the processes that are currently in place. You have global liquidity, you have fractional ownership. Meaning that you can have much more people owning stuff, like you can sell the Mona Lisa not to a rich collector, but rather to the whole country of Argentina, if they are willing to pay for it via tax, I don't know. There's just so many possibilities that I opened up by this.

Yes, I think there's a huge opportunity for security tokens. All the smart people I talked to and the smart people I live with, they believe this year and the next year, I'm going to represent a bomb for these kinds of tokens, as more and more exchanges and stock exchanges start to look into this and as regulation starts to settle down. Then as for utility tokens as we were speaking, there's these kinds of models that have been tried so far. Some of them are being proven to work, some of them are being proven to work less. It's a huge research development experimentation field, and we have to be aware that 99% of this utility tokens will be dead in four or five years from now, but the 1% that survives I think is going to cause enough change and enough impact in this sense of coordinating networks in novel ways, but enough change in enough impact so that it's worth pursuing them and it's worth failing a hundred times to find them.

[0:56:18.5] JM: I agree with you. Well Felipe, it's been really great talking to you. We didn't really get into as much of your article as I anticipated, but I think we covered a lot of the same questions that you were exploring there, just in a roundabout way. Do you have any closing thoughts, or things that we didn't get to discuss that you want to mention?

[0:56:40.8] FP: Yeah. I probably like to leave the message that please, don't dismiss this whole market and don't take it as just some useless work that's been done by a lot of crazy or greedy people out there, because there's really a lot of integrity people giving their best to find

this 1% of use cases that are actually going to enable really novel forms of value capture and value creating in the internet. Don't dismiss this.

Try to research as much as you can. Try to get better discerning what's well intended from what's bad intended and join the party, like everyone in the community is pretty much open. Research happens in open grounds, open channels, so we're all learning together and we're all trying to be as humble and as frank as we can, and as fast in researching, developing and shipping stuff as we can. We need talent and we need more people to join the community and help us push this forward. That I guess is my closing thought.

[0:57:36.7] JM: Okay. Well Felipe, it's been really great talking to you.

[0:57:39.3] FP: Amazing. It's been a pleasure, Jeff.

[END OF INTERVIEW]

[0:57:43.8] 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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[END]