

Tory Shepherd (00:00):

Good day. I am Tory Shepherd. I'm the political editor at the advertiser who is rapidly being learning about blockchain technology for this next session, which is called links in the blockchain and is brought to you by green waste essay. So I'll introduce you to these guys and then they're each going to give a short presentation. And after that, we'll go to questions and answers. So as you're listening to them, start having a think about what more you would like to know how many people here are experts in blockchain. Are you here to learn about it for the first time? Who's who's all over the topic. Have you seen a letter about it for the first time? Hey, all right. About the same as me. Great. So from left to right here, we've got Mark Pesce. He works at Digital Culture, the digital cultures program at the University of Sydney.

Tory Shepherd (00:39):

And you may know him from ABC's the new inventors. He's an inventor writer, entrepreneur, educator, and broadcast. That all sounds very exciting. He's the author of six books and he currently hosts this week in startups, Australia, and they all. Now I'm skipping across Michel Bauwens here, the founder and director of the P2P foundation. He works in collaboration with a global group of researchers in the exploration of peer production, governance and property. He's also research director of commons, transitions.org, a platform for policy development aimed towards the society of the commons, enabling a more egalitarian and environmentally stable post-capitalist world. And in the middle, we have associate professor Ellie Rennie. She's the deputy director of the Swinburne Institute for social research. She's a leading thinker on the social dynamics of technological change. She works on problems where the standard approaches to communications policies, infrastructures in products fail, including in Australia's remote indigenous communities. Her recent work looks at the emerging opportunities and challenges of automated governance through blockchain technology. All right. So without further ado, Mark, you're up first to explain to everyone what we're talking about.

Mark Pesce (01:46):

Good afternoon, everyone.

Mark Pesce (01:48):

Can I get my slides up please? So blockchain is a word that gets used a lot. It's not magic fairy pixie dust, and we need to be very clear on that. And what I want to do is spend about five or six minutes explaining to you what a blockchain is and how it works, because it's not that complicated and that then you go, is that it? But it really will be. So what we're going to do is we're going to start, it all starts off there's this paper that was published on the internet, you know, that says pull of weirdness in 2008, which described a new technique for being able to tell whether things were valid, whether they had been tampered with or not. And it's called a blockchain distributed ledger. There's a bunch of different terms for it. And this is this is the abstract from that paper.

Mark Pesce (02:35):

And what I'm going to do is I'm gonna walk you through in a simple example, simpler than you'd probably find in the real world, but Clare example of how it works. And what we're going to do is we're going to use something from the real world that has meaning to me and something that I need to be very clear about and very transparent about, and very accurate about my travel expenses. Cause I actually travel a lot for a living and travel for clients and my clients expect that I'm not going to cheat them when I should have submit my travel expenses as you'd expect. So what I'm going to do is I'm

going to make a blockchain of my travel expenses and let me show you how to do it. So two weeks ago I went to Brisbane and I left my house in Sydney and went to Sydney airport.

Mark Pesce ([03:17](#)):

And then I landed in Brisbane airport and went to the hotel where I was speaking. And then I went back from the hotel to Sydney airport, and then I went from Sydney airport back to my house. And so I have four different taxi receipts here. And I shared them with the folks who were actually paying me for my trip. They're like, yeah, you're right. Those receipts look absolutely nice, mark. That's absolutely fine. Okay. What I want to do now is I want to bundle these receipts up in a way that allows the folks who I'm sharing this receipts with and me to make sure that they haven't been tampered with. So what we're going to do is we're going to create a signature that uniquely identifies those receipts. Now the fancy mathematical term for this is a hash. And so we're going to go in generate that hash right now.

Mark Pesce ([04:05](#)):

And the hash basically looks like a great big, long number, but here's the thing you need to remember about a signature or a hash it's unique. If I changed a single digit on any of these receipts and actually their photographs, if I changed a single pixel on any of these photographs, that signature wouldn't just change a little bit, it would change completely. And so changing anything even a little bit changes the signature completely. And so that signature is truly unique. All right, that's my first bundle of receipts we're done now this past week, I went to Melbourne for a client. And so of course I have a receipt to take me to the airport and another receipt to take me to the venue. And then another one to take me back from Melbourne airport and then another receipt to take me home. And so I have another bundle of receipts that I've also shared with another client and they're like, oh, you're right.

Mark Pesce ([04:59](#)):

These receipts are all fine. Okay. So I want to bundle these receipts together, but, and this is the magic bit. Before I bundle these receipts together, I'm going to take the signature from the first bundle and pop it in here. Now, why would I do something like that? Well, let's say I got the evil idea that I was going to tamper with the first bundle and I tampered with the first bundle, but also updated the signature on the first bundle so that it agreed right well at this point, the signature for the first bundle is in the second bundle. And so when I create the signature for the second bundle, it has the signature of the first bundle in it, which means that if I tamper with the signature of the first bundle, it's not going to agree with the signature that's in the second bundle from the first bundle.

Mark Pesce ([05:55](#)):

And we'll do this again because I have a bunch of receipts from this trip and Adelaide. So I've got that, that and of course I'm going to create a signature for this bundle, but I put the signature from the second bundle into the third bundle. And that second bundle has the signature from the first bundle. So you see what I've done. I've chained the bundles together by putting the signature from the previous bundle into the next bundle. And because of that, if there's any tampering, anywhere, the numbers don't add up and you know this. And so what you get now is this chain of bundles that are roughly equivalent to a kind of set of Russ Russian nesting dolls, where each bundle has enough information from the bundle before it, that you can tell if those bundles are true. In other words, if they are authentic or if they have been tampered with, and because the signature of each bundle is in the next bundle, the bundles are chained together, and that's where a blockchain comes from. And that is all of

the magic right there. So now, you know how a blockchain works most blockchains in the real world get fancier, but that's the basic idea than it aligns them.

Tory Shepherd ([07:28](#)):

And up next, we've got Michelle too. Oh yeah, no, I think it's you Michel.

Michel Bauwens ([07:34](#)):

Well, I can compete with Mark's technical knowledge and with his suits. But yes, I've been traveling for nine months and you can see it and nine weeks, sorry. So I'll, I'll try to give a bit of historical and contextual knowledge to why the blockchain is, is important. Why people, why do people get so excited to it? And so I'll start with the phrase that the blockchain is to accounting, what the internet was to knowledge and computers. So in other words, you know, the internet creators universal way to exchange knowledge globally, and the blockchain is really a universal accounting mechanism. So universal distributed ledger. So that's why people get excited about this. And it has to do with two things, accounting and trust. And so to understand why, why this may matter, I'll give you a very little history of trust.

Michel Bauwens ([08:32](#)):

So we start our human journey in, you know, little nomadic bands and then eventually tribes settled tribes. But we live in small groups of people, you know, few dozens to 150, according to anthropologists and private biologists, we can remember 150 relationships. So this means that as long as we small, we know each other, we have kinship friendship, and we can basically solve our issues by going to talk to someone. But of course we didn't say, so that was a little brother or little sister, if you like. So we trusted each other because we knew each other. But then of course, humanity scales, we invent royalty, temples, empires, domination, slavery, you know, all the, the big windfalls of civilization. And so how do you make that work? You know, when you have a huge, huge empire? Well, we switched from little brother to big father, right?

Michel Bauwens ([09:33](#)):

We, we invent or if you're a believer, you know, we discover basically religion and the fact that we all watched by somebody who can reward and punish us. So if you're, you know, if you're part of the Islamic empire or the Roman empire, or, you know, the Christian middle ages, you behave because you're seen by big father. And then of course we invent the nation state and the nation state that's big brother, right? We, if we're lucky we vote some people in the government, but they start watching us measuring is monitoring us, training us, and everything gets recorded. And basically we trust each other, like, you know, think about Scandinavia where people really trust each other because they trust the institutions and they trust the Goodwill of the institutions. And you probably know this is not working as well as it, it used to like the, the drop in trust in institution is down from 70% in 2003 to maybe 20% nowadays.

Michel Bauwens ([10:43](#)):

So people don't trust institutions anymore. And actually there's, you know, who we trust now we trust peers. So if you look at the, like the worldwide surveys of the Edelman trust barometer, we actually started trusting our peers much more than our institutions. And so the F so that the fact you have, you know, what mark was focusing on was trust, right? Trusting his, his things, his receipts. And, you know, as we complexify to a world where global networks become more and more important over and above

nation states we need trust mechanisms. So you should also see that the blockchain has a return to little brother, but at a huge scale. So we are basically globally scaling small group dynamics. That's what the internet is about. We're making these huge projects through the internet with average teams of four people, and we build Wikipedias and we built software to go to the moon and satellites and stuff.

Michel Bauwens ([11:46](#)):

And underlying that is also, you know, these accounting systems. So accounting, I should say a little worried about that too. You know, every big revolution in human society has been an accounting revolution. So when we moved from tribal federations to the states, you know, empires and kingdoms, we invent accounting. The first writing that we find is a ledger in sumer, that's actually the original writing. So it starts with counting things in accounting, because these temples, you know, they got the grain from the farmers, they had to manage the grain, make sure they, they protected it. So that was really what the state was at. The origin was a way of managing flows and inventing accounting for it. And how did we get capitalism? Well, the same way in the 15th century, there's a book, an Australian book about it called double entry, which I recommend is, you know, how in the 15th century, because we had free cities in Europe, we didn't recreate the empire.

Michel Bauwens ([12:45](#)):

So the craft guilds in the merchant guilds and the Franciscans and the Templars that were, you know, working in these cities and, and, and try and starting to do business, they invented double entry book accounting, and that gave us capitalism. So in that, in that context, the fact that we invent a new accounting mechanism, like the blockchain is very significant. Now it's not the only thing I want to just mention another thing, which is actually for me, more important. So I work with peer production communities as was announced. And so those are global productive communities who mutualize their productive knowledge. So WikiHouse wants to make sustainable housing. We can speed makes cars that are used five times less fuel. We keep pedia, you know, all these things, they are global productive communities. And around these communities you'll find entrepreneurial coalition. So people need to make a living around these shared resources.

Michel Bauwens ([13:43](#)):

And we just concluded a study, which was called P2P value. It was a consortium of eight organization amongst which the P2P foundation funded by the EU. We, for three years, we studied 300 paper reduction communities. And to my big surprise, we found that 78% of them use contributory accounting. So this is not even the blockchain. This is, these are ways to measure contribution. So not labor commodified, labor, labor as a commodity as we do today. But autonomous people, freelancing people who decide to adopt another value regime. So they basically want to decide for themselves what the value is. So they recognize all kinds of contributions and they have accounting systems for that that are not double entry accounting. This is a new form of accounting and therefore a very powerful sign of a shift in our civilization. And lo and behold, one of these communities called SENSORICA, which is an open scientific hardware community.

Michel Bauwens ([14:45](#)):

So they share designs for sensors and stuff. They're are actually today linking up. They're very contributory accounting system to the blockchain. The second thing where it's important is, you know, as we move to circular economies and we need to move to circular economy, since we already overusing the planet by 1.5, is that we need participatory supply chains. So we need to mutualize and share our

supply chain information. Otherwise it's gonna take 50 to 70 years to even negotiate circular economies. So these new business ecosystems, these entrepreneurial coalitions that work around these shared resources, they are, they are developing open supply chains. And how do you, what you need for an open supply chain. You need trust. You need to know that these things are real. So they are also very much looking at the blockchain as a way to do what, what they call network resource planning.

Michel Bauwens ([15:41](#)):

So it's kind of like what companies do, but open to all the suppliers, all the users, all the consumers, and everybody can see what everybody is doing. Now, I want to conclude with a bit of a warning. So I call these the, the, the necessary necessity of a value sensitive design. So I'm a bit of a lefty. You might have guests. And so I'm a bit worried about the underlying philosophy of the blockchain, which is, you know, the people who originally designed it, which is we all individuals and we make society by contracting with each other. And so there's no really a vision of society, of governance, of democracy in this vision. And so if you, for example, when you see they, what a lot of people get excited about will be, oh, we have this peer to peer energy system, and everybody can sell his excess energy to each other.

Michel Bauwens ([16:39](#)):

Yes, maybe it that's good if you believe that everything should be a marketplace. But if you look at Germany, that's not what they did. It was consumer cooperatives and then mutualize their energy together and they set it together and then they find ways to distribute it together. So it's very important that we make that we are conscious of the, of the underlying values of the technology we are using including of the blockchain. And so if you want a blockchain to be useful for more egalitarian outcomes, we really need to look at at that end, that what we built with and around the blockchain reflect our values. That's it. Thank you.

Tory Shepherd ([17:25](#)):

Thank you so much, Michel. Ellie, you're up? Okay. So

Ellie Rennie ([17:29](#)):

One way to think about blockchain is that this is a means of rebuilding the internet as it probably should have been built from the beginning. Mark has told us how it works. And Michelle has told us a little bit about why it matters. And as the third block in this particular chain, I'm just going to verify what they said and maybe add a little bit to it around what it means for a new kind of internet and our institutions and our economy. Blockchain is talked about as a revolution. And if you read the articles in the papers, there's a lot of hype around it right now, but I do think this is something that will become normalised into our lives very quickly. We might not even use the word blockchain in five years time, but I think it's also crucial that we maintain our attention to it.

Ellie Rennie ([18:18](#)):

I don't mind the hype. I think there's a lot of stuff to work out and we need to we need to name it. Someone once wrote, well, quite recently in, in relation to blockchain, that if you ask people in 1989, what they needed to make their life better, it was unlikely that they would have said a decentralised network of information nodes that are linked using hypertext. I love that quote cause the highlights you know, this, that the kind of technical nature of the internet and the worldwide web that very few of us back in the late eighties understood, but which we just now accept. And it underpins every aspect of our lives, well, most aspects of our lives. Anyway. So we've heard that some of the key elements of this

technology are it's peer to peer in nature cryptography. It's also a consensus algorithm, which means that that the different nodes agree on a transaction and that's immutable.

Ellie Rennie ([19:18](#)):

It stays that way. It's the first time we've had a technology that does this as a result, it's called the it's called a trust machine, or some people refer to it as the internet of value because it's the first time that we can actually safely transfer value. A young chap could Vitalik Buterin. Who's founded a platform called a theory. I'm a blockchain public platform, which I highly recommend you look into some most exciting thing in the world at the moment. He says that there look, there are many centers of trust in the world. Those centers can be government agencies that issue marriage certificates, or, you know, they register your dog. Some of them are large corporations and the internet is way NOAA has become dominated by a few large players by big corporations like Amazon, Google, and Facebook because they've developed systems and concentrated resources into making the internet secure for us.

Ellie Rennie ([20:18](#)):

And they've grown to that size. I think it's interesting. They've grown to that size because they walk this fine line between being private corporations and doing public good. So they'll interact with governments in order to meet our, our public expectations. A good example of that was during the Sydney linked hostage Sage where Uber got criticized because it had surge pricing and was charging people in Sydney to get of the area at these exorbitant prices. And it reacted quite quickly to stop its algorithm from doing that because it needs to maintain a kind of public expectation and image with blockchain. Actually, none of that really matters because that is ingrained within the code itself, that we trust it because the code will carry out trusted functions for us. So there's no reason why we need large aggregators, like, eh, like Airbnb or Uber anymore.

Ellie Rennie ([21:18](#)):

Some people say that blockchain will disrupt the disruptors for that reason, but it could also at the same time disrupt the agencies the, the bureaucracies that administer and oversee a lot of our public services as well. Those kinds of registries, you know, land titles medical records, all kinds of use cases when it really interesting one is identity. The internet has been terrible at identity. Whenever I want to sign into a new website, I I get asked, do I want to use my Facebook profile in order to verify who I am? So we're again, putting up personal data into this big private intermediary with, with blockchain. There's a, there's a, there's an application under, under development at the moment called Newport on the Ethereum platform with checking out, we basically could have our own private avatar where we control our data and it interacts in a web three environment for us as we choose it to do so all the problems of identity on the internet, maybe resolve through this, we might not need passwords anymore.

Ellie Rennie ([22:35](#)):

It means really important things in terms of efficiency. So cutting out intermediaries of course means scaling back on costs. So we don't need those kinds of middle, middle steps to get to the end of a transaction. So that's really important for industry, but it's also important for someone here who wants to send money back to her family in India, who wants to do it instantly and not pay transaction costs alone on the way. And yeah, it's also radically transparent. There's the possibility that this could lead to new forms of accountability, accountability in terms of overcoming government corruption, because you can see all those transactions, not just mocks or states, but all the kind of, you know, say within election

fundraising, et cetera. So, and then of course, as we've heard, it also allows for new kinds of cooperative systems. A lot of the hype around blockchain at the moment is in financial technology.

Ellie Rennie ([23:45](#)):

I don't personally think that this is the most revolutionary aspect as Eric Vorhees says, moving from a permission financial network between banks to a permission financial network among banks is no great step for mankind because in some respects, this is just a giant database. It's a lot of it's about backend processes. What I'm interested in is the areas where this, this technology might transform things that don't currently work very well in my world, an example that doesn't exist yet, but which some colleagues and I have been thinking about and hoping to create is putting academic journals on the blockchain. The way that they currently work. I'll just put this out there. As the academic journal publishing industry has a higher percentage profit than apple Elsevier has a higher percentage profit than apple. So everything that goes into an academic journal is produced by people, such as my colleagues who are funded by public money to create public knowledge, but then because we don't have very good systems, it gets locked away by private companies.

Ellie Rennie ([24:53](#)):

And then universities pay again for subscriptions, for us to access that information and knowledge, knowledge is what suffers here. What you could do with blockchain is that I, for instance, could publish my journal article anywhere. Not only would the certification be there on a public chain to show that it has been refereed and approved within this particular, by this particular group of academics and it's therefore verified. But those that are doing that blind peer review could also own reputational token something which at the moment is just gets lost in the academic system. It's labor that we get w w which isn't factored into our metrics. So that's just one system that's broken. And I think it could apply to many, many different areas like that. We have, we have systems for banking, we have systems for government processes, but there are things that we don't have good systems for.

Ellie Rennie ([25:51](#)):

This is where I think that the true potential of blockchain lies, but you know, as, as Michelle has outlined there, there are things here that we need to be cautious about. I said earlier that this will be normalized, but it's, it's also, it's going to be normalized in a way where it integrates with artificial intelligence, with the internet of things. This is what's going to allow those robot cars to, to go refuel themselves and pick us up. This is the transactions underlying that system. So we're putting our faith in these what what's called smart contracts that will determine those transactions. They're not very smart. They're not very, they're not actually contracts, but what they are is X is self-executing code. So you set up a program and it will then if some, if, if a particular condition is met, it will self execute.

Ellie Rennie ([26:54](#)):

That's all well and good, but what happens if there mistakes in that code, or if those mistakes were intentional. And there's a, an example called the Dow, which we can talk about in question time, if anyone's interested, which was the first major I suppose, mistake where \$150 million was put at risk through this, but progress is being made all the time and you don't really need to understand how it works. I think for that progress to believe in that progress, I get on a plane and you know, I have no idea how planes work, but I know that every engineer w that looked at every single plane crash beforehand has tried to overcome that. And that's because they shared information. And I think blockchain

innovation is similar. Will it keep improving the machine, but do we want to leave that simply up to our programming community?

Ellie Rennie ([27:49](#)):

And if you dive down into some of the forums on Reddit and cryptocurrencies and the rest of it, you'd be quite alarmed by the conversations that occur there, Bitcoin, which is the original and largest blockchain is, is, is going through this kind of I dunno, Christ's governance crisis and may in fact, not last because of it because of the people behind it. So anyway, I'm going to stop now, but just to put some questions out there, there are questions around, what do we need to do to bring our existing regulators and authorities up to speed and which, which of those authorities and regulators won't we need anymore because of this technology, some of them are going to be made redundant. And I don't have all the answers to the human failings behind this so-called immutable technology, but we need to be keeping our eye on that. We're going to need new institutions to interact with these technocratic palace structures.

Tory Shepherd ([28:49](#)):

Thank you so much, Allie, while you guys were talking, I kept thinking of that. I think it's an Arthur C. Clark quote about any sufficiently advanced technology is indistinguishable from magic. So hopefully as speakers have taken a bit of the magic out and introduce you to this technology, if you've got a question, please make your way to the microphone that's here now. I might kick things off. I think there should be a microphone up on the balcony as well. I might kick things off with the doubt. So what happens when things go wrong with the blockchain?

Mark Pesce ([29:21](#)):

Okay. So let, let let's step back. The Dow, the digital autonomous organization was a 6,000 line program that created a venture capital fund that didn't have any venture capitalists or board of directors. All right. So you can think of it as a, as a corporate constitution that was written in computer code. All right. And so people could buy into it by buying shares in it. And they raised, it was \$150 million, sort of the largest crowd funding that had happened in the history of the internet. Now, as that raised is being finished, I talked to one of my friends, who's a very deep geek in these matters. And I said, have you taken a look at this? He says, yes. I said, and he says, it's 6,000 lines of code. I don't think it's going to be perfect. Turns out he was right, because getting it right with 6,000 lines of code that no one has run before, after you've handed it \$150 million to play with maybe is not the best way to test something.

Ellie Rennie ([30:18](#)):

So what happens then is that the some, it's a very smart group. I think that we don't know if it's an individual or a group exploited the code and started leaking funds out of the Dow. Was it six hours ish? And it was great because it all started someone within the Dell community posted a tweet saying guys, I think on Reddit, I think something's going on in the Dow, but you know, it seems to be leaking funds, but I'm on my way to work. Can someone check this out? Which, which, which I kind of loved to kind of showed how there was this true community who was interested in it and keeping their eye on it. And one thing that was, was, was important about the code that they did, right, was that it was a number of weeks before anything could actually be moved. So they put a timeframe on that. And so, so the whole community got together and said, what should we do? And and, and they, they ended up actually rewinding the whole Ethereum blockchain,

Mark Pesce ([31:22](#)):

Which you're not supposed to be able to do because it's, it's basically taking blocks and saying those blocks never happened after you've made those blocks. But, and this is a very key point here is that all of this is actually a social construct. Yes, there's mathematics underlying it, but it's actually a social construct. And so if you get 90% of everyone to agree, you can say, okay, actually folks that never happened. And that's literally what they did.

Ellie Rennie ([31:48](#)):

But for me, one of the most interesting things about this was that the the, the attacker at so-called attacker, it was like a bank heist. That's the best way to think of it. Said, hang on. I'm not doing anything illegal here. This is, this is written in the code. This is permissible within this self-executing code. And if you try and unwind this, I'm going to Sue you. They didn't actually do that. I mean, I personally, I think it's the equivalent. If I leave my, my garage door open and someone steals my car, I still think it's theft. But anyway, they were the kinds of questions that this raised yes. Works.

Michel Bauwens ([32:28](#)):

So I'm just going to take the occasion to make my little critique on it, right. And it's distributing something that's not good is not progress for me. So I'm a big, you know, I used to be a start over twice and I'm very familiar with, with start with startups and venture capital. And the venture capital system is a very extractive and destructive system. So to merely then distribute it and say, oh, everybody can, can play that game. It's the same as Bitcoin. Bitcoin is a democratization of rent extraction, right? It's designed in such a way that it was easy to make the coins in the beginning and more and more difficult after. So basically if you buy the coins early, you can sell them a higher price and you haven't done anything. So it's, you're extracting value from people coming after you.

Michel Bauwens ([33:17](#)):

And so if you look at the results of Bitcoin, it's more unequal than even our society today. So that's very important that in a Dao, for example, one of, you know, one of the underlying values was that they believe everything can be done by code. And that's, that's also a belief system because you don't, you don't trust people. You don't trust democracy, you don't trust governance, so, oh no, no, we don't need governance. It's just going to be the computer. That's going to do it in our place and we can trust the computer. Can we so I just want to mention that as you know, one of the dangers with this technocratic thinking is that we push everything in the, in the computer, believing is the machine, but it's actually us. We have designed the machine. And so it's still in there. Both are good. And our bad behaviors are actually in the design of these things. Alrighty,

Tory Shepherd ([34:10](#)):

Let's go to some questions. Now. It usual spiel, no statements, please. Just short questions to the point. Thanks. Sure. Can the panel, please

Ellie Rennie ([34:17](#)):

Give us some examples of how this

Speaker 6 ([34:21](#)):

Blockchain would be applied to our social institutions like education and health. All right. No, no, no. Please

Ellie Rennie ([34:32](#)):

Look at there's, there's a lot of work being done on health at the moment. In the U S for instance, health insurance fraud is a really big problem because their health insurance is so terrible. So having secure and distributed systems for health information is the kind of thing that we could see here. And, and as, as I said before around identity if that's kind of linked to your own personal identity on the blockchain that's also going to be beneficial because it's something that you keep rather than you know, providers. All right. So

Mark Pesce ([35:09](#)):

A little story here. My uncle is a very sort of prominent research chemist in America. And he was the vice president of a company that did medical tests. They forged his signature on a hundred million dollars worth of medical tests, which then the F probably that whoever was providing the federal government came and tried to Sue him for, because it was his signature on all of these fake documents. So it's exactly kind of fraud that a blockchain would at least be able to limit. Could you maybe add to that about how

Tory Shepherd ([35:44](#)):

It could affect people's lives? I was having a look at the internet of things, which I think is such a great phrase. So how will it tie into that?

Mark Pesce ([35:50](#)):

This is really good. So I don't know if you've seen over the weekend, there was a massive attack on the American internet. Did any of you see, this was the front story in the New York times. It started Friday in America. The thing is, is that massive attack was coordinated by an army of cheap web connected cameras. All right. So the kind that you throw in the house in there on the wifi, and it turns out that they have default passwords on them that are really easy to hack into. And there's a couple of programs that were released on the internet to be able to scan for these devices and subvert them. And you had half a million of these devices that were being used to attack some of the core services on the internet. So the American internet basically went down for about 24 hours.

Mark Pesce ([36:40](#)):

Now that's the problem, but let me put this now say it's four years from now when there are autonomous cars and a hacker breaks into one of those. So now on a longer, it's a camera, that's attacking a website somewhere. That's now a two ton vehicle. That's moving at 150 kilometers an hour, and it's under someone else's control than the driver. So we have this fundamental need for devices to be able to authenticate that they're running the code that they left the factory with, or when they get an update that that update is coming from the trusted source. And these are areas where it's fairly clear that blockchain will come in now IBM and Samsung, you know, them, they make the exploding mobile phones have been working for the last couple of years on standards that will bring the blockchain to the internet of things so that we can have this level of stability.

Michel Bauwens ([37:34](#)):

Yes. Maybe a little anecdote from how these things can be used. That's actually not a blockchain, but it's a good example. Anyway, so as you know, the banks have, you know, after 2008, the subprime, they're not doing it with cars with poor people. So they are lending money to poor people in the U S who can normally not afford cars at very high interest rates. And these cars are linked to a satellite and they just turn off your car if you don't pay. So in the middle of the road and they just stop your car and you have no control over your own car. And so you can see how the blockchain would facilitate those things. So it's always about, you know, the law of unintended consequences. It's like how people use the technology is a human question. It's, you know, with what kind of mentality are you using the blockchain and the banks, for example, what they're going to do.

Michel Bauwens ([38:25](#)):

And they're very interested in the blockchain because it, according to their prediction is going to eliminate 90% of their infrastructural investments. So huge amount of savings, and it's going to have them it's going to is it gives them a shot at playing the remittances market, which is \$500 billion. So the banks are very enthusiastic. You talked about FinTech. But what they are doing is actually private blockchains. So, you know, I'm talking about universal accounting systems. That's not what they are doing, right. They are using it, but then they are doing something else with it. So they actually may even eliminate some of the transparency that's inherent in the public blockchain. I

Tory Shepherd ([39:07](#)):

Read your money will be able to transfer money and have it appear immediately in another account, which seems like magic. Cause we usually wait three days. Sorry. Next question.

Speaker 6 ([39:15](#)):

Ellie, I'm interested in, in implications for remote indigenous communities that you've been looking at and you know, cultural value, not just monetary value, I suppose, is one thing that comes to mind.

Ellie Rennie ([39:28](#)):

Yeah. I'm not sure yet about remote Aboriginal communities, but I've been working with some indigenous communities in remote Sarawak Malaysia. And it, they're really interesting because they have a sharing economy already like Uber, but without any internet platform to coordinate it. So they coordinate amongst themselves using text messages and WhatsApp. And if you wanna someone's take you a ride in their boat down to the next village. You can do that. And they've got these systems, you know, the kind of self subsistence systems in a, in a place where there's no welfare or very little and th they've just, they've done that as a way of making do, but it's quite hard for them to coordinate. And it would be really interesting, I think like they wouldn't want to go through a big intermediary like Uber, which takes massive profits at the top and where you need particular kind of standards and the rest of it to comply the credit card and the credit card.

Ellie Rennie ([40:29](#)):

Of course. So I think that, you know, what, what will be interesting is when we start to see those kinds of economies on the margin, making use of this in, in a way where, where they can have efficient, trusted systems that just really working with their daily lives for indigenous communities in Australia, I've got another project with Telstra, which is looking at cyber safety and a lot of the problems that we're saying around the way that people share devices because it's you know, kinship networks demand sharing obligations in remote communities, very different ways that money changes hands. I'm sure a lot of you

will be familiar with this. But when, and, and mobile phones were not designed for those kinds of uses, so you end up with people posting inappropriate things on others, profile young people kind of you know, basically overstepping cultural protocols and the consequences can be really, really, and cause into family feuds. So I think you know, if we can, if we can start to think about how these technologies and identity in particular might work in better with those systems, that would be really interesting, but I personally haven't come up with any answers yet.

Speaker 7 ([41:50](#)):

Thank you. Hi there.

Mark Pesce ([41:53](#)):

It was a great idea and a great book called antifragile by the black Swan guy. They are, there is about things that gain from disorder. So every commercial airline plane crash and we learned from the system gets stronger. How does the blockchain, or does the blockchain support that anti-fragile idea? Why are you all looking at me? Yeah. I'm not a big Toledo fan. I actually don't believe in that thesis. So I actually am not going to sort of subscribe to it.

Michel Bauwens ([42:24](#)):

Maybe I have a sort of an answer. So the, you know, in the open source philosophy is that there's always enough people who can add some knowledge that you need at a particular moment. So open systems because of their transparency are actually very good at learning from their mistakes in a way that private organizations, which want to hide their sins and, and you know, are not. So the idea, the generic idea for me is because the blockchain does a really good part of the blockchain. It's a comment it's open code. There are open communities working with it has a very good chance actually to share that learning in a very fast way so that these issues can be overcome. And of course the exam would be the Dao, which, you know, immediately was known and discussed and solutions were found in a very, very rapid way.

Mark Pesce ([43:16](#)):

Although there was six hours of simply people watching it happen. Cause I was on Twitter as people were just all freaking out because their money was disappearing. That was also very interesting too, because it's, it's a, it's a type of tragedy, but it's not a human tragedy. It's a program failure that's happening in real time in front of people. Can you

Tory Shepherd ([43:35](#)):

Tell us about some more possible future applications? You know, w we'll be able to have like a census that doesn't break down or be able to vote online.

Mark Pesce ([43:44](#)):

One, one company that I want to highlight here, and I've been talking about it quite a bit as a company out of Sydney now called fro full profile. So full profile are a group of folks who both do commodities trading, but they're actual farmers and this they've used the blockchain to solve a big problem. So when a farmer raises a crop of grain and takes it into the weighing facility and it gets weighed and it gets graded and it gets stored there, they get a chip that says, this is what you brought in. And then at some point later on a grain buyer will come in and buy the grain and then maybe on sell it two or three times.

And then finally we'll end up maybe at a baker where it's getting mailed and the payment will be made and the payment will flow back through the chain to the farmer.

Mark Pesce ([44:23](#)):

That's around 120 to 180 days later. And that's also a best case scenario because if there's a credit failure at any in there, because someone lied about how much assets they had, almost all of their credit risk, always lands on the farmer and the farmer gets paid nothing for the crop, even though they have sold the crop and that's to the tune of around \$4 billion a year across Australia. So it's actually a large problem. And so what full profile has done is when the farmer brings the grain in, it goes into an entry in the ledger, distributed ledger or blockchain, and then any buyer for that also has to present sufficient added assets. And that also has to be verified in the blockchain so that when the sale happens, there's just a transfer of the assets and the farmer is paid immediately. And it sounds like that's really easy to do, but in Australia, because we have a fully deregulated commodities market, you wouldn't have to know anything about the buyers or the sellers. So the blockchain provides that layer of trust that the parties need to be able to trade in a deregulated market,

Ellie Rennie ([45:25](#)):

Smart guns. This is quite a recent example, which went to what's called initial coin offering, which is basically the crowd sale. So it's, it's a, it's a blockchain ledger that is used for gun registries. And it's you register your gun, which is a smart gun as in an internet of thing, which will you know, be tied to your, I suppose, biometric, what do you, what do you call it? Identities kind of your, it will be tied to you. So you can't actually use this gun if it's not your gun and the blockchain will record that. And some people think this is a good thing, because it means that, you know, guns can't be as easily traded. And you know, if it's, if it's illegal gun or an illicit gun I'm sure there are also very sinister outcomes of this, but that's, that's one example at the extreme where's, where's

Tory Shepherd ([46:31](#)):

The government involvement. Are there people starting to think about how you would regulate blockchain technology with the internet of things?

Ellie Rennie ([46:38](#)):

Well Michelle and I were on a panel with the asset commissioner last week and he's absolutely got his eye on blockchain. He's all over it. And I'm very interested in particularly with financial markets and how, how this can be beneficial, but also what regulations they might need.

Mark Pesce ([46:58](#)):

So then we should mention, because it's already ongoing ASIC apartment, not the ASX is moving its settlements to the blockchain that has already been announced in is happening. In fact, it's very bright fellow who read the 6,000 lines of code and said, he's now heading up their development effort, which makes me feel very happy because he's probably the brightest person. I know who's working in this space. So sometime in the next 18 months, settlements, which have been done through ways that can fail, if the ASX loses power, like it did a couple of weeks ago, we'll start to be done on the blockchain. So there'll be transparent. There'll be visible to everyone. There'll be inspectable and there'll be certain. So the stock market in this country will be on the blockchain sometime in around the next 18 months. And this is something, although if you read the AFR, you would have sort of heard about it. This is a huge thing.

Tory Shepherd ([47:50](#)):

Is anyone just being shy? Does anyone want to come up and ask another question? I can keep going all day. Michelle, you spoke about when you're talking about peer to peer networking, you talked about energy markets. Now energy markets are of immense interest to us in south Australia because of the whole state lost power at one point. And a lot of that has to do with how power is being drawn from interconnectors and distributed through the network. Is, is there a better way to do things?

Michel Bauwens ([48:17](#)):

Well, the only thing I know about is about, you know, these projects, I want connecting individuals. So I don't think it's, it's not yet at that metal level. It's basically communities that you know, want to create local energy distribution between neighbors and some of these projects like in Brooklyn and other places. I think there's a place in Australia as well. Yeah. That are doing this through the blockchain, but I'm not aware of any, you know, Metta project at this stage.

Tory Shepherd ([48:48](#)):

So sorry, what's the Perth project. So

Mark Pesce ([48:50](#)):

There's a project in Perth called the companies. There's a startup called power ledger. But what they're doing is they're working. There's lots of folks who bought solar PV panels because the feed in tariffs were really high and then WOA ran out of money. And the feed in tariffs had been slashed, but these folks are generally in small communities. And so they wanted to be able to work out a way to be able to sell the electricity to their neighbors. And the accounting is always the thing that ends up being expensive in this. And so they're using a blockchain to basically re re rag, radically reduce the cost of that. It does add, it adds the question around, are we trying to make all of this purely transactional, or are we saying that a community, so solar citizens for example, is a big part of this event, you know, would they buy a whole bunch of panels for a community and then, you know, sort of use the blockchain in order to sort of keep track of comings and goings, but it's a community project. And the way they're using that blockchain is more around reinforcing community resilience and capacity rather than around just tracking who owes, who, what?

Michel Bauwens ([49:53](#)):

Yes. So, so the issue is I find it very important myself is, you know, do we choose asset-based solutions to social problems? So let's say the, the issue of Airbnb as a good example. So if you have a house and you're a bit precarious having, you know, the capacity to sell, to run your room is a good thing for you. Now, this kind of people are only 10% on Airbnb. 90% of Airbnb are big owners with lots of houses. So they're basically hotels that don't want to be working in as a hotel. Cause then they don't have to do all the stuff that hotels have to do. Right. But, okay. Let's, let's still assume for the 10%. It's a good thing. However, if you look at the effect of Airbnb from another perspective, well, what if you don't have an asset? So if you don't have an asset, if you don't have the money to buy a solar panel, this is not a good system for you because it actually creates more inequality within the neighborhood.

Michel Bauwens ([50:55](#)):

Some people, you know, with money to buy lots of Cerner Belk and then sell to their neighbors, and then you create more inequality within your neighborhood. So these are things we always have to think

about when we choose an asset property-based solutions is that it's good for people with property. It's less good for people who don't have, or have a less property. And for example, Airbnb, what it does is it actually chases away people from neighborhoods because it drives up the rent. And if you know a bit about what happened in Spain, the trigger for the for the electoral victory of a progressive coalition called en comu, which is a common space coalition was a demonstration in Barcena letter from the people protesting against Airbnb and what was doing to the neighborhood because it made it unaffordable for families with children to stay in this neighborhood, which wasn't yet overrun by tourists before Airbnb came in.

Ellie Rennie ([51:51](#)):

But I think also if, if you take it to its logical conclusion blockchain could could mean co-operatives that we, we actually don't need asset some assets at all. I mean, the, the car is the obvious example that it can be its own corporation, which is run by a cooperative of people who own, you know, tokens of this system that pretty much runs itself. But you know, I mean, a lot, a lot of the discussion around this, this new kind of automated society is that, you know, you won't need a power drill anymore because it'll be so easy to just get a power drill. That's located somebody else, somewhere else and use that we won't have garages full of stuff anymore. So this actually moving, I think possibly, possibly, maybe this is complete utopianism, but moving away from asset driven society to a true sharing economy, not like the one we have at the moment, which is really just an aggregator economy.

Michel Bauwens ([52:54](#)):

Yeah. So one of the cons, one of the practice we defending the P2P foundation is something called platform cooperatives, right? It's the capacity of users. Let's say Uber drivers, but not Uber, right? So you create a co-op like in Austin, for example, where Uber left, because they didn't want to follow regulations that were voted in a referendum. So they don't want to play with normal rules. They only want to play on when, when they determined the rules. So that would be a co-op that would be co owned by the drivers and eventually in a multi-stakeholder system with the city and the users. And of course those systems could also use the blockchain to manage their complex systems and create trust within that network. So that's something that, that is possible. Of course, what happens always is that it's first, unfortunately, the people with money who drive the, you know, the direction in the beginning and it takes a certain time before the government and the citizens say, oh my God, this might not turn out the way we want to. Maybe we win. So we always a bit reactive. And so that's, what's, you know, what happened with many, many technologies and it's happening it could, and it probably is happening with the blockchain. So that's why people with different value systems have to think about how to use the blockchain for their users, for their benefits. And that's going to be quite different from FinTech which is developed from the point of view of the banks and their, and their interests.

Mark Pesce ([54:28](#)):

Well, we do have this, I think moment that we're in now where the cost for an accounting system. So the speed bump that you incur is now gotten so low. So we're seeing, I think in blockchain, a similar process to what happened in the web, where for the first four or five years, it was the large owners of intellectual property, the magazines who showed up, and then you get Wikipedia, Wikipedia. We could have done Wikipedia from pretty much day one on the web because wikis were invented the same time the web was, but it took almost a decade for people to sort of get their heads around. Oh, we can use this to share knowledge and create this virtuous cycle of knowledge sharing. And I suspect that

blockchain will follow a similar pattern because it just takes a while for a culture to get its head around something like this.

Michel Bauwens ([55:15](#)):

Yeah. I'm, I'm just reminded of an anecdote. So when we invented television for 10 years, people just put cameras in front of the newsreaders. Yeah. So it was radio with, with, with filming, the guy was reading the news and that was television and it took 10 years before somebody said, oh, we can move the camera. All right. So, you know, that's how it works. People, the imaginary of people, it takes time for them to integrate this new potentiality. But I want to say one more thing is the importance of transaction costs in society. Right? So think about bike sharing. Bike sharing was tried in Amsterdam with a provost in the 19 1968 or maybe early seventies. And they tried it five or six times and it failed and failed and failed again, it was called a white bike program and they would put free white bikes everywhere.

Michel Bauwens ([56:07](#)):

Why did it fail? Because some people said, oh, I can use that bike and painted red and it will be my bike. So it's the tragedy of the commons. And, and this was because the cost of me of maintaining and policing was just too high. So once we had geolocation chips, there's no like 6,000 bike sharing programs in this major cities in the world, including some Chinese cities with 400,000 bicycles, it all works because the cost of maintaining and protecting the resource has become trivial. So this is one of the things that's feeding the commons, revolution. The sharing revolution is it's not cheaper to share than to own individually. And for example, one shared car can replace 24 private cars in terms of matter and energy expenditure. But here's what happens when you don't do it. Well, Uber, right, Uber doesn't have a commons. It makes a drivers compete for being at the right place, the right time to be a, you know, get the app signal. So if you would drive like Friday evening, you would see there's hundreds of cars with drivers driving around. And so there's studies showing that with Uber, despite the possibility of sharing, it actually creates more traffic because the way they designed it in their interest. And so these are design issues that we really have to look at the very key.

Tory Shepherd ([57:39](#)):

And unfortunately, we're going to have to end on that note. So if everyone can thank our speakers.