Mathieu (00:02.978)
So what I've enjoyed over the past few years in our conversations, Antti, is we've done, I think this is our third podcast together, which is cool, is that the conversation is very much around adoption and the adoption conversations are much less about technology conversations, but more about the business side of things, I would say, and building the right incentive models and crafting ecosystems so that decentralized digital trust ecosystems work. And that's, I think the biggest challenge we have today is just digitally transforming existing ecosystems to being able to adopt these things and making sure that we're able to find win -win -wins or whoever's involved is, getting more value than they are getting today in the current way that they're doing things.

And so you wrote a blog post recently called the adoption challenges of wallets and decentralized ecosystems, which I think is a good point to start because I'm hoping we could have a conversation today around decentralized ecosystem design. I think you have a lot of good stuff to say there. So for those interested, we'll link the blog post in the show notes, but maybe the first area where we could start around that is how do you look at value chains for decentralized ecosystems versus centralized ecosystems where a lot of the big networks have been created around kind of these two -sided marketplaces and the value proposition for the demand and supply side of the marketplace is very straightforward to understand. And the business model for the platform provider is very simple to understand as well. So how do we look at the value chains that affect adoption for decentralized identity? And how do we maybe contrast that with the existing platform models of today?

Antti Kettunen (02:00.942)
Yeah, thanks. It's again, it's a privilege to be here. Like you said, I think this is the third time I'm becoming a regular. Really great to be here. And so actually I think on the topic, I've written a couple of blog posts and the previous one about a year ago, we wrote about more about the wallet wars or it was the sort of the war of ecosystems. And after that, just maybe a month ago, I released the adoption challenges blog post you mentioned here.

And I think the War of ecosystems is a good example of what we see as the war happening right now. If you think about just Apple, for example, Apple is a master of ecosystems, but they're the master of their ecosystem. They're just masters at building that. And they're a really great example of building a very long-term, very multifaceted ecosystem where you can bring people in, bring consumers in, and organizations from different angles and start to serve them with different kinds of services.

And I think just the Apple Pay as an example is a really great example. Apple Pay just didn't happen. Before that, you had a decade or over a decade of iTunes and you started to purchase stuff from there and you realized that, hey, I can now pay with these things everywhere else as well. And what that happened, it created an incentive model for other organizations to join in and become recipients of that.

Obviously, there's a lot more to that, the whole payments ecosystems. But they're very good. Apple Pay is sort of the gateway drug into their ecosystem, and they don't want to let go. And you can imagine that if Apple is able to be the future, for example, in every loyalty transaction, they are in a very prime place to utilize that.

Other centralized models you can see, the easiest one to imagine are YouTube type of producer model, consumer model, where you can serve both sides. So that's the easiest way to understand. In order to attract consumers, you want to attract producers as well. And the same thing is any kind of gaming consoles who want to get those exclusive relationships in order for customers to be attracted. And that's easy to understand because you have a platform and everything you do, you do to benefit your own business, your own value chain and you control the value chain. You are the center. You're the solar center of that value chain. So it's very easy to understand. It is very easy to grasp. And all the efforts go into making that work.

Antti Kettunen (04:37.00)
Now, if we think about that same idea in our well -known decentralized identity value chain, and we all know the issuer, holder, verifier, model, or relying party, which terminology you want to use. That is essentially a disconnected model. The problem there is that we think that we can sell that as a centralized platform. And the reason why we probably think that is that we may be a little bit naive in thinking that we want to provide, for example, privacy or we want to enable the holder as a central party that we all want good things from.

In essence, it is like that. We are human beings. We rarely actually want bad things to other humans. But the point is that we're still doing business. So any decisions we do, we make from the basis and from the view of the business we are representing. So for somebody else to say that, yeah, we're willing to give up a lot of money just to make the whole issuer holder verify ruling party triangle work. That's not happening.

We would like for that to happen, but realistically speaking, we're not seeing that happen. And if you think about that, that triangle, you can split it up into two, two parts. You have the issuance and you have the presentation. And I like to say that the value potential of, of this whole value exchange credential exchange model, it starts from the issuance, obviously. So that's sort of where you string the bow, you string the bow and you hit the tension. That's the potential energy we're creating. That's the value potential we're creating there. And that potential energy, that potential value is realized only when you actually use that. You can hold those credentials in your wallet for a millennia and it still would not realize the value. So there's no real benefit to the issuer there at all to give that out necessarily to the holder until the relying party realizes that and until that ecosystem somehow produces value to the issuer as well. So we have two different value chains actually. We have two different value chains within this credential exchange model where the one is the issuance, the one is the presentation. And these are disconnected. They have nothing to do with each other unless we create some kind of value chain on a wider or larger value chain that makes the issuer benefit from some of the relying party actions or vice versa or whatever other means of gaining value from the issuance happens.

And so as we know from EU DIA, for example, there are exceptions to this. So EIDAS 2, the European identity regulation that's now in place, it mandates certain issuers to issue at the stations, mainly public sectors. And that's a regulatory mandate. So they don't even need to request incentive, They just have to do that. So this is definitely this is something that excludes those regulatory mandates from happening. But that's the basic idea there is that we are very different in the decentralized identity ecosystem. And I think we may be even a little bit naive in this that we are thinking that we can just sell it as technology. Whereas we need to think it not just from a singular technology value chain, but we actually need to think about it in whole three, even four different layers.

Mathieu (08:22.07)
Yeah, I think it's clear in the traditional platform model that the supply or content producers in certain models, like you're describing, kind of like rent out their content or rent out their services or whatever input they're providing to the platform. The difference in the digital identity space as well is like the, I don't know if you want to call wallet the platform. If you're kind of an issuer of credentials and you're adding some value into the wallet ecosystem, but the wallets are closed. They're not visible to anyone. And so it even makes it ever more difficult for the demand side of the value chain to kind of understand what's there and discover and come in and get stuff. Do you see that as a challenge as well? Because if we consider like that two side marketplace where the value needs to fit. So in the platform model, the content, for example, and, and, and our world the digital credentials, these things aren't visible to anyone. So it's kind of difficult at the same time for the demand side where the value is actually created to even understand what's there or even how to initiate it.

Antti Kettunen (09:36.21)
Yeah, there's definitely challenges exactly like that. I think those challenges are solvable. And I was just talking with about the e-receipt ecosystem earlier today. And we can talk about it that little bit in a minute. But I've been talking about the e-receipt ecosystem with a couple of different people who come from different areas from US or some who have been working in China, Some have been working in Europe and we Nordics are doing our things. And it is obvious that the difference of approach is something that really affects how you approach the market as well. Or in this case, if you think about the issuer side, like you said, the supply and demand side in this case, what controls that? And especially in Europe, we see a lot of the things that are being controlled through regulation. Obviously, I love the meme where they say the US innovates and China copies and regulates. And that is true. And what that also affects is a lot of the market dynamics.

Antti Kettunen (10:48.07)
But I still think in every case, the best way to think about it is, that who is most invested in the whole ecosystem. So if you just think about supply and demand, You can start to draw circles that would create an ecosystem. Like an issuer, let's say an issuer would be providing identification capabilities. That's the simplest we understand. That's very simple. So an identity

verification would be very simple because it's used almost everywhere. So you can draw any number of circles between issuers and relying parties to create some view of an ecosystem.

And that's what you need to start doing is to understand what kind of business ecosystems are actually here. And that leads to, well, who is able to bring those ecosystem members together? And there you start to see that, well, is there some kind of an industry authority that would be invested in making that industry ecosystem work? And obviously, if you think about travel, for example, I think travel has one of the strongest industry ecosystems. If you think about the players there, you have different players like IKO and Ayada there. They're providing a lot of standards and they're providing a lot of market support. So they have to be harmonized. They have a singular need to make the travel ecosystem work. They want to make it secure. They want to make it sustainable and work for work for all the world. So they need to be thinking from global perspective, not just from geographic or regulatory perspective from there.

And so there you start to see that, hey, we have ecosystem that is very strong and they need to think the whole holistic perspective. So that if you contract what is a platform in decentralized ecosystems, that's that's where I would start the comparison from. The platform If you compare, let's say, YouTube in this case. The platform would be, let's say aviation industry, where you would have the industry ecosystem and you would have the main players. You would have the issuers, the holders, the relying parties. But the difference there is that the issuer may be a member of this ecosystem or they may be a member of multiple ecosystems or they may come from outside of that ecosystem. But the platform need is there. The decentralized platform need in this case being the whole industry ecosystem, that's still there. So it's up to the industry to coordinate this effort to make that happen. That we need the identification capabilities. We need to be able to have those passport issues capabilities and who can provide them and somebody needs to run them together. So I think that's the simplest example to think about is the aviation industry because they have a lot of coordination to do on that end.

And yeah, but it's really interesting to think about that. That's how I would frame that. So when we talk about and think about platforms, supply and demand side, it's not about individuals. It's all about framing that ecosystem and being able to coordinate the effort, coordinate, not control, coordinate.

Mathieu (14:07.01)
You mentioned Apple Pay is kind of a gateway drug and it took a while for adoption and depending on different geographies in the world, these types of payments systems that have different uptakes. Do you see payment as being like a big enabler for these platforms or for these ecosystems as well? Because it seems like in a lot of use cases, even like the E-receipts one that you're describing, the whole lead up to getting a receipt is a payment.

The whole lead up to getting, I don't know, an educational diploma is something you need to pay to get it type of thing. And so when you start to think about it in these platforms or these decentralized ecosystems, often the supply side of things will start from kind of a demand

perspective where they want to be a consumer of something, whether it's a payment or whether it's something else.

Do you see that as a good approach to getting issuers in an ecosystem or kind of coming up with a value proposition? If the value is realized through verification, if you start from a verification where everyone is able to reap value directly from verification as a starting point, then kind of the next step is just kind of a logical next step in that process, which is maybe just a digitization or a different way of doing what they do today, like giving a receipt out or giving out a diploma type of thing.

Is that a good lens to use when you're designing these types of ecosystems?

Antti Kettunen (15:39.14)
I think the payment example is an apt one. But I think it's challenging because I'd be very careful in that because the payments ecosystem is very complex. And obviously there's a lot of regulation there which requires that it's done a certain way. And there are certain players and a lot of under the hood players that fulfill certain roles. It would be very tempting to say that the payments industry is a very good example or the payments is an example of transaction which we should aim for. I would say that user experience wise, if you think about payments, it's probably one of the transactions that happens most in the world. Just for us as individuals, we just do that almost every day, multiple times a day. So it's very natural that that is something that needs to be very fluent and that we need to maybe even piggyback some way. And if I would think about that, maybe it's hard because, I don't want to say that payments is the most it is the most important, but it's also the most mature one because that's the thing that we don't want to be naive that we can solve payments with digital wallet suddenly or somehow new. That's not going to happen. It's taken decades to actually create these current payment systems, even centuries, if you think long term. So for payments as transactions, I think it's a very good example of a very, very mature transaction, even in digital terms, that we need to learn from.

Antti Kettunen (17:22.05)
And we may actually be able to couple something to it. So let's think about that more. I will give you now the e-receipt example. I think that's a very good one. So if you read my blog post on the adoption challenges, I go through the e-receipt as an example of describing the two different value chains, the checkout part of the merchant and then the usage part of that. And I tried to describe it in three layers. The first one being the technology layer, the value exchange model, credential exchange model that we understand. And that is an example of just, it's a framework of exchange of value. And if you think about payments, payments have multiple of those already. So we are not creating anything new. We are creating new, but we are not replacing the payments credential model for that. We're just creating one for credentials in this case.

Then you have the business value chains, which are in this case, the merchant value chain. Merchant cares only about their own business. So they want to make sure that their checkout flow is good and it's fast. So that's the place where you want to focus that, hey, we want to make

sure that whatever happens, we don't slow down the checkout process because that costs us money.

And the other side of that is the presentation side, which is, let's say you want to use it as an employer's reimbursement system. And that focus is really on how does the employer, especially if it's a large employer, how do they make that process as cost effective as possible? So they probably want structured documents and information that you received so that it's very easy for employees to input that information so there's not work time done for that used for that and and the expense reports administrative costs go down. So that's sort of another value chain. There's huge benefits there. There can be mainly costs on the merchant side.

And then the third layer is the ecosystem value chain. And that is really the full value chain described from a higher level perspective where you start to calculate that what kind of value does the merchant get as an impact in his business. So if their business is really about the checkout and we want to say that, hey, we want to bring in a new request of send me a digital receipt. And if we need to scan a quick QR code or do an NFC beep or anything like that, it will bring in another five to 10 seconds or something like that to the checkout, which will accumulate to huge numbers. So obviously the merchants say that no. We're not getting anything out of this. So why would we do this?

And then when we go down the value chain from ecosystem perspective, we see that, OK, that is a negative net impact, whereas the holder, the buyer or the employee in this case would get a positive impact because they get structure receipts. And this is sort of our naivete here is that we think from the holder perspective, they get lots of good stuff.

We also think from the relying party perspective, they would get a lot of great stuff because they get structured data from the receipts, they get automated processes and they get a lot of administrative costs go down, employees are happier, et cetera. And so the further we go to relying parties, then we start to see a lot of positives happening there. Now, if we think of this, it's minus one for the merchants, it's plus four for the employers, it's a huge imbalance.

Antti Kettunen (21:01.09)
And now let's get back to the transaction being the payment. So one way to think about this is that, well, how can we turn to the negative net impact of the merchants? So because we're, if we want to include issuance of an e-receipt to the merchant process, so their business value chain, we need to create something that turns their negative impact to a positive impact because we want to introduce the wallet. And there are a few ways of thinking this. One is that, If we look at only that singular value chain, we can bring in new stuff with the wallet. And this is where the transaction or payment comes. Well, can we somehow bring in other things, other information with the payment transaction?

And this is, I think the interesting part is that how valuable is the payment transaction? Can we inject or can we utilize that for certain other things? And as we remember, there's a huge amount of players and things under the hood. So it's very difficult to actually become part of that

ecosystem and try to suggest that, hey, I want to bring in something from my wallet here. So we need to also think that. But that's one way to think about it is that what other problems there may be for the merchants that could be solved with the wallet. So it's not about necessarily can we, in this case, hijack the payments. We hopefully will see that happening at some point in time, but not at first. It will take its time before any kind of payments come in, maybe payment verifications. We have those coming. We've had those in Nordics for a while already. I know that not everybody has those, but definitely verifying payments, for example, is something or account to payments. There's something that could be utilized through the wallets. I'm going there. Definitely. I'm not a professional in that area.

But using the wallet technologies to, let's say, chain capabilities that merchants would benefit from. So you would have maybe age verification for any kind of products that require that. You would need maybe some kind of proof of discounts or maybe you want that receipt address there. Or maybe if this is an online delivery, maybe you want just a physical address, where shall I deliver this? So these are all things that will slow down the checkout process and make it so that the merchant wants to optimize this. So if we can provide a valuable asset in the digital wallets transaction, which includes not only the payments, but also other things, that may be interesting.

Antti Kettunen (25:53.001)
So I think that's the thinking here when we think about only the singular value chains, always about what can we provide, what kind of value we can provide for this particular type, if it's an issuer, if it's a relying party, if it's some kind of a wallet provider, what is the value there? And think always from their perspective, because if we can't get them in, in this case, the e-receipt issuers, the merchant as e-receipt issuers, We don't have an ecosystem, so we can't realize any of the value for any of the users, even if there's hundreds of users of the e-receipts that would benefit from them. We don't have that unless we get the merchants in it. So that's why it's not about the payment necessarily. It's about the user experience of what happens in this case with merchants.

Payments are part of that. And I think if you can bundle the payments with everything else, you start to get a valuable package because the payments is something that you can do with Apple Pay, for example. But Apple cannot bundle everything together. They would want to, but they can't necessarily. In some cases, they can bundle already probably age verification, but the receipt stuff. And if we want to go to the Apple ecosystem, yeah, they probably want all that data. And it's now up to us to see if we can create a better, better option here and better alternative.

Mathieu (25:22.02)
That was quite interesting. And it made me think as well, like these big platform providers, whether it's Apple that provides Apple Pay or similar thing on Android through Google type of thing. Like the other thing that made me think about with the e-receipts example is they actually own your identifiers that you will often get the receipts sent to in a digital way as well. Like when we check out of a hotel and we get our receipt to send to our email. And in a lot of cases, it's

Microsoft emails, it's Google Gmail emails, it's Apple emails. So they also own all of our identifiers really in a digital sense today. And then I don't know what your thoughts are on this, but an assumption that I'm making in the near term is that the wallets that are going to be used for high integrity credentials coming from governments are going to be government wallets and/or Apple Google wallets type of things as well. And so it makes it difficult to think as well, like where do we start taking control of our identifiers or how do we start using identifiers that aren't bound to these, if I could call them platforms that we could then start to use within our different ecosystems. Does the way the wallet space is going concern you a little bit to achieve what we're trying to achieve here with the centralized ecosystems?

Antti Kettunen (26:54.04)
That is a terrific question, a supremely hard one in my opinion, because that sort of we need to face the reality in that. You're absolutely correct that I always try to simplify to some people that identity is essentially identifier management. Yeah, that's if you want to really simplify, that's exactly what it is, is you need to control the identifiers. And then it's about who controls the identifiers or who creates trust towards the identifiers. I think that's a good question.

I think maybe one way to look at it is that identifiers are really about anchoring your identity to a governance model or governance ecosystem, governance framework in a way. And like we do in self sovereign and identity, it's all about managing your identifiers. So it's not about somebody creating for you the identifier, but you creating your identifier for them, which gives you the control. Right? So that's really what we've been fighting. I'm also part of some of the large scale pilots, the EUDI Wallace scale pilots. And we've been looking at the design of the EUDI wallets. And we've been trying to advocate for the use of DIDs or other types of identifiers that are user controlled.

And I think that's really a key thing there is that you need to be able to control your identifiers. But then you have another problem is that even if you have a wallet in this case or any kind of device that allows you to control your identifiers, that sort of the control that you have of yourself, of your identity then. But there's the other side, which is that the ecosystem members want to make sure that the parties that are involved in the ecosystem are also somehow vetted or somehow agree to certain governance requirements via contracts agreements.

Antti Kettunen (29:04.09)
So it means that not all wallets are actually part of all ecosystems, even if you would have the protocols and that sort of the technology is something weird that we don't even need to discuss that. So the technology interoperability is a huge thing as well. But even if we would have those spaces covered, even if we would have full technology interoperability, we still need to think about the ecosystem level interoperability in terms of is this wallet provider allowed to work with us in this case, in this particular ecosystem. And that's, for example, in the EUDI ecosystem, we see that there's the trust service provider model is there for this purpose specifically is that there are parties that are audited, they are being confirmed that they have a certain level of technology and they fulfill certain technology requirements.

And only after that, they're allowed to be part of the EUDI ecosystem. Now, if we start to think of that, let's say in banking ecosystems, I say, I want to bring my identifier to the banking ecosystem. So obviously banks are not willing to trust each and every wallet provider, whatever the reasons may be. So that's, I think that that's quite a dual question because even if you find your perfect privacy preserving wallet, Can you use that wallet in all of the ecosystems you want?

So are we actually going to be facing a situation where we, after a few years, we're seeing that we have five to 10 wallets. And just because I want to be part of X number of ecosystems and not all of my wallets are part of those. So I think this is the interesting adoption challenge we're going to be seeing. And It remains to be seen how that's going to be sorted out. But you're exactly that's the problem that we're going to be seeing. It starts from there. Control of the identifiers and trust in the parties that actually manage those identifiers. And we use to sign those keys because banks want to make sure that if you're signing things with your wallet, that your wallet is appropriately secure and up to certain standards. If they're not, they're the ones that are going to pay. So again, we come back to liabilities, we come back to the governance and agreements.

Mathieu (31:27.09)
It may be a good point to jump back and you had started describing this a little bit about looking at the value proposition for each member within a, if you want to call it a supply chain or transaction or within an ecosystem. Have you been able to develop some sort of framework when you're looking at a new ecosystem? And maybe there's an example of an ecosystem that you're working in that you could use here, but just when you're looking in and you're starting basically from zero and you're looking, Hey, how could I digitally transform this ecosystem using digital trust tools? is there a framework or some thinking around that that you've been able to use in order to really push the dial or move forward with uptake in different ecosystems to actually create these decentralized data exchange models?

Antti Kettunen (32:24.22)
I haven't found a generic model yet, but the approach is actually very similar to when you would look at this from a singular business perspective, but you just need to step up the ladder a few steps. So to me, the only way to develop ecosystems, like decentralized ecosystems especially, is to take the high level view. So you really, you can do it If you just take technology providers, for example, we have a lot of parties that have been creating wallets. And we have a lot of parties that develop technologies in this space and they want to sell them to parties that are interested. But when you start to think about the value chain from a decentralized perspective, you need to think it from the top view and You want to start to think it with those who actually get most value out of it and who have the problems in that ecosystem space.

So I will give you an example of another EU project I'm working on. So I'm part of this EU funded program called PHEMS, P -H -E -M -S. You can find the website as PHEMS .EU. It is a, what we call right now, it's a pediatric health data space.

The PHEMS is short for a long word jumble, which I don't go here right now, but it's essentially what we have there is we have multiple European pediatric hospitals and they want to enable access to the data that they hold. They're data controllers, obviously, but they want to enable access to research. They want to scale that. And they have a challenge because currently how it's done is that each hospital, each data controller provides access to researchers, whether they are researchers from universities, whether they're researchers from pharmaceutical companies or whatnot, they provide access through their own system that they control, it's called secure processing environment. So essentially it is just sandbox or it's an environment with no access out. So you can't copy anything out of that. So it's very limited on what you can actually do in it. And within that space, they give some access to some data, which has a specific permit processes done before you actually even get there.

So it's a very, very meticulous process to gain any kind of access to that. Before you even get into the secure processing environment, you need to define What are the cohorts you want to be using? What is the research for? And what are the ethical things, ethical challenges? And the whole data print process is very long and very meticulous. And each data controller holds their own secure processing environment. So you can imagine, especially if you work with rare diseases, you will have the situation where one data control's data is not enough for you. You want access to multiple ones.

None of the permit processes or permit applications or data models are harmonized. So you have to maintain the process as a researcher to all of these. So if you want a lot of data, if your research needs a lot of data, you need tens or even a lot of data controllers. So currently, this the scaling of this is impossible. You cannot do it like that. I have no idea how they do it right. In practice, the scale, if there's any research that actually has scaled that far or how long does it take? I know that for some it may take months to go through the data permit process and a lot of iterations and manual work.

So what we do in this PHEMS program is a pediatric health data space. And what we have in the vision, we started essentially from the problem space of defining what is the problem in this ecosystem. They have already their own, the European Children's Hospital Consortium. So they were sort of known to each other. It was a very good starting point. The data controllers knew each other. They knew they had a similar goal of scaling things out. They had different maturity levels. They still have different maturity levels in terms of technology, but they have the need and want to work on this and start to scale this.

Antti Kettunen (36:58.12)
So their problem was more about how do we scale this and make it decentralized so that our work as data controllers doesn't grow. But if we can scale the amount of research and ease the access to our data, we know that everybody wins. The products or researchers that come out of this become better. They land faster. If we do this right technologically, the manual work in each data controller goes down. And so it means that the operative costs go down. So there's a lot of win-win things there.

So we started to map out this thing. So we started to map out what is sort of the benefits that we can derive from this. And we got multiple benefits out of this to data users, essentially, because who gets the benefit? It's not the hospitals. The data controllers get some benefit through the ease of that. They get more tools. They get costs down. But the real benefactors of this are the data users, the researchers or the universities or companies making validation to their algorithms or these kinds of things.

So then the question is that in this ecosystem, we have the issuers in this case, the data controllers and the other side of the table are the data users, which would benefit a lot from formation of this kind of ecosystem. So what we did there is that we started to design what is needed for each data controller to be able to accept certain common rules, certain common processes, so we can harmonize things. We need to harmonize data models, obviously. We need to harmonize the applications of the data permits. We need to harmonize the processes that we go through. And then we need to start to think about the liabilities.

So in this case, the data users, Instead of going to one data controller, they actually just need access to a workspace that is trustworthy. So instead of controlling each process with each data controller, I mean, separately, going to their secure processing environments, we wanted to create a model where the data users have only one workspace, which acts as their interface to the network.

So that could be imagined that that is a type of wallet for them, for example that they're using, or maybe even a different type of service that creates value in this ecosystem. And so in this case, it's about the data controllers being able to trust the other side of the table, the workspace. And while ongoing these data permit processes, proving that we have valid research, proving that I'm a real human being with certain credentials. So authenticating myself, maybe with a wallet and then proving that our ethical practices are OK. We have the correct permits in order to execute this. The data cohorts we need are approved by data controllers. Let's say one data controller approves all of this.

Then the next data controller, let's say the first data controller comes from Finland. Then maybe the next data controller Let's say from UK or let's say from from Netherlands. We have all of those in the project. So maybe they trust the Finnish one so much that they said, OK, we see that the Finns have already accepted. So maybe we can do this easier. Maybe we can trust a little bit more. We don't need to necessarily go over the whole process, but we can just say that because you have already a verified data permit as a credential. Maybe we can trust you as well. We'll give you our data credentials where obviously data controllers are very restrictive and they want to make sure that everything is okay. So it's their responsibility. So I'm not saying that this will be just everybody accepting others. But what I'm saying is that when we create transparency in this case, that some others have trusted, we are able to increase the trust.

We are also able to increase the processing speed of the whole research, if you think about it, the researcher just needs to go through the workspace and submit the data processes, the data permits through that to all of the data controllers. So you may be able to reach tens, maybe

even in the future, hundreds of hospitals through just a single user interface in this research ecosystem.

Antti Kettunen (41:50.19)
And so we're just designing this, but I'm very happy to say that the current design is looking very promising in it that The organizations involved have been giving us very good feedback. Many are very excited that this is something that really is able to scale this. And at the bottom of everything is really the governance model. It's not the technology only. We have designed it with decentralized identity tools in mind. But the governance model and the roles and relationships and liabilities are really at the key there.

That what kind of agreements in this case workspace provider, would need to agree to in order for the data controllers to accept their researchers or the researchers that come through them. So in order for a workspace provider, this is now we get back to the thinking about the wallets and the multiple ecosystems in order for a workspace provider to become part of this. So they need to sign agreements. They need to have either auditing or self audit their systems. And they need to accept liabilities through contracts. They need to accept that they know what they're doing and they agree to the processes they need to go through. So the role is not about technology. The role is about accepting liabilities and making sure that your process, your system runs through those steps.

Because if something happens and some skeptics may say that always there's always the brown stuff hits the fan. That's what sort of the data controls are worried about that. And that's understandable. And that's if you think about that setting, we have workspaces, we have hospitals and data controllers, and we have a governance entity now. So we have an industry body in this case that is coordinating the efforts of all of these so that we can make sure that this ecosystem actually runs.

And we haven't even gone to the incentive part. So that's sort of the next thing would be to think about what kind of incentives in this case would a workspace provider need to be able to accept those liabilities. So you need to think about that internal economic model as well as external one. And yeah, so I'm getting excited about that. So I could talk another hour of this topic.

Mathieu (44:15.05)
I would love to get into the whole topic of incentives, but maybe just one quick one before going there within a data ecosystem or a decentralized ecosystem. You've just described in the context of data controllers in the pediatrics space. you talked about an ecosystem that knows each other. So they probably have different things to say about each other or claims to make about each other. Cause they already have that trust kind of created and in thinking about trust management, thinking about just being able to see bilateral claims between one party to another definitely enhances the level of trust and could kind of enable certain things to actually work. You talked about the roles, relationships, which could kind of be this, and the liabilities.

How important is thinking just from a business architecture perspective within an ecosystem, then we'll get to the incentives. But in order to make things transparent, how important is thinking about the kind of public data within an ecosystem versus more private data, which has to maybe do more about the transactions between two entities altogether. Do you start to see a clear differentiation and a need within an ecosystem before you even get to the wallets and credential exchange to have some layer of public data That actually makes all of this available or that actually makes all of this work.

Antti Kettunen (45:42.18)
I want to make sure that I understand because you said public data and then you mentioned transactions, which are in my opinion, two different transactions are generally not public. So I want to make sure what you meant by public versus private in that case.

Mathieu (45:58.22)
Yeah. So, so for me, someone asking a data controller for access to research data type of thing is a private transaction that happens between the two of them. But in order to enable that private transaction to happen, they all need to be on the same page basically. And they have to be on the same page about what the roles are, what the liabilities are, just the overall governance.

So that underlying layer that I just described in the second half of this, is there a need for this stuff to be transparent, public, open to either to the ecosystem together, or even if there is a need for participants or technologies from other ecosystems to interoperate or collaborate with it, is there a need for a specific data layer to be public or open to even enable these more private transactions to happen?

Antti Kettunen (46:50.05)
Mm. Mm. Yeah. Yeah, very good. OK, now I get you. So yeah, definitely there are. You could describe it as multiple layers in an ecosystem. So in our particular use case, we describe what we call layers of trust, where we define four different types of trust layers that need to be in place for anybody to actually trust anything and all of those layers need to be anchored into some level of governance.

And usually those governance mechanisms have what I call trust mechanisms. So different kinds of technical pieces that allow you to verify that a certain requirement has been met. For example, one would be that are you technically at the same level? Are you audited at the same level? That could be a sort of technical infrastructure layer. This may take different forms. For EUDI, obviously, it's going to be the auditing of the qualified trust service providers and their technical auditing capabilities.

But then again, there's the next layer, layer two, what we have is the ecosystem membership layer. And that's where we have trust registries. So the trust registries are all about tying in the roles. So they're not tying in the technical capabilities. They're not tying in the wallets. They're tying in the role. And the role in this case for us is the workspace providers, it is the data

controllers who have signed an agreement with the ecosystem governance entity. So it's not necessarily a technical provider, it is the business provider. And that is about understanding that is your contract and agreement in place? Have you accepted liabilities? And that's the second layer.

And then we have a couple other layers that deal more about trustworthiness of the exchange data, whether that's machine learning algorithms or machine learning models or any kind of data processing algorithms or the identities in the network, which are more about the data users or the researchers, project entities, et cetera.

And within that scope, you can find that there's the public ones, or actually these are public within this space, actually, our network design allows that anybody could read those if they would want to. But they don't get anything, any benefit out of that. So it's more about like the trust registry is there to assert that certain identities, certain roles have been for this party are there and they have signed agreements. S, yeah, definitely we need all of that, because that's the basis that if we want any kind of decentralized trust to be formed, we need to anchor it to something, whether that form of anchoring comes from, let's say, a trust registry, which is much more public many times. It could be public, it could be private, or whether it's a credential or some other technical mechanism within the exchange, that doesn't really matter.

We know, for example, that the KERI technical system carries its own mechanism to prove the events that have happened with your keys. And then you would use another infrastructure to just evaluate and verify those to get those witnesses. So that's another way of thinking about it. For us, it's been that the technology is the lowest level and then the ecosystem roles which tie in with the governance and the business models and liabilities. And then more about the content, about who are you? What is your project, is this a valid project? What's the data you were actually processing? So we have those layers very similar to the trust over IP for four layer model, but we've created our own version of that to make sure that it's understandable and it fits our purpose.

Mathieu (50:50.20)
Wonderful. Now talking about incentives, this probably is part of the framework of looking at an ecosystem and designing it. If you don't properly understand the incentive mechanism for each participant, it's kind of not going to work. So you could potentially imagine, and I don't know if this could be turned into a framework, which could be turned into some plug and play model type of thing, but different members in a value chain are going to reap different benefits depending on the type of transaction that is happening. And then there's going to be multiple types of transactions happening within an ecosystem. Is there a scoring mechanism? Could you add and subtract from one another?

Because you can imagine if you're trying to transform a process, you'll see, OK, like these Participants are clearly benefiting a lot, but these ones, it's either zero or could even be a negative. Is there a way to balance these things out and to create just a positive score overall around just incentives for different members to actually participate so that they're willing to do it?

Antti Kettunen (52:00.08)

Yeah, there are. And I use it briefly in the blog post we mentioned earlier. And I would love to say that I've come up with these kinds of things, but now there are a couple of great books that I definitely want to recommend. I think I recommend this earlier as well from Ron Adner, The Wide Lens is just a really great book that dives into the theory of everything. So that could be constituted as some kind of a framework. It doesn't really provide how you start to find out the value for each, but it just gives you some tools to be able to map these out. And I've used and modified some of them just to understand the very, very basic idea for each member of the value chain, understanding what is the relative cost, what is the relative benefit, and just subtract those.

And you have essentially the impact that you're looking for is that are we in net zero or net positive or negative? And those kinds of tools are available. They're also available through ron adner.com, their website. So shout out to Ron Adner. But I do recommend the book, The Wide Lens, very, very good book. He also has another one, which is excellent, Winning the Right Game.

So there's a lot of great frameworks for that kind of thinking. And I've been using and utilizing them, especially just to question my own thinking because many times when we fall in love with our ecosystem, we become very blind. So these are very good tools to try to piece together what is the reality. And what Adner tells also that are reconfigurations of the ecosystem. And but that's that's sort of very painful. And that's why you need to think it from high level up, because this is the part where you rarely can actually make huge impact by yourself. Maybe in some case, if you think about an ecosystem that we are that have been disrupted, like the Airbnb, for example, being great example of disruption of the hotel industry.

And they essentially were a completely new player that disrupted everything. They said that, yeah, we actually we have here, we have here a lot of apartments that we could rent out, but we don't own any of them. So they by themselves reconfigured the ecosystem. In decentralized setting, It's also something what the reconfiguration may be. It may be a lot of things you can add parties, you can subtract parties from the value chain. You can combine forces or even separate, relocate them. So it's really about trying to figure out the full value chain. And that's what the platform economy is about, is thinking about that, who can I replace?

And I think the decentralized ecosystems are the same thing, but we need to look at it from maybe an even wider perspective. And the change may be a bit harder for that purpose. Or I don't know exactly. So we're still very young in this space. That's how would different kinds of decentralized ecosystems how they're able to disrupt the current ones or could somebody disrupt an existing decentralized ecosystem. So there are a lot of tools available, but I said that the theory comes in that book. So in Ron Adner's White Lens, I do recommend those if you're very interested in those and definitely something that we've been working on for a while as well, just to think every time we're looking at an ecosystem or potential ecosystem, we actually evaluate it like this, that, okay, who's the issuer? Who's the relying party? Who should be the

holder, like business-wise? What's the benefit of all of this? Why would they do this? Would it be in any part of their business plan? And if we want to validate, we just ask them directly, hey, is this in your plan? Okay, what's your business like? How would you feel if something like this would happen? Do you feel this is your role?

And so it's really, you need to come in from a perspective of the whole ecosystem, not necessarily even drive your own agenda. But in this case, the goal should really be how do I make this full ecosystem work? And I do see quite rarely that kind of approach right now. I've described myself as an ecosystem architect and that's something like you, you talk about business architecture. This is also involved in that. So ecosystem architecture in terms of understanding the business and the technology and the governance of the ecosystems. And we need more people like that. I believe we need more parties that understand the value of making an ecosystem value chain work. If you can't make that work, we don't have any value. We don't have an ecosystem, essentially. We just have players who say they're bringing disruption, but nothing really happens.

Mathieu (57:09.266)
Yeah, so for anyone looking to be on the new platforms, all these things are going to be extremely vital to your success. So I would say, Antti is a great person to chat to about this. Antti, thank you so much for doing this again with me. I really appreciate your time. I always very much enjoy these conversations and learn a lot. And I'm looking forward to our fourth one.

Antti Kettunen (57:38.846)
That's wonderful. Thank you, Matthew. It's always a privilege. Hopefully you got a lot out of this, whoever's listening. Thanks so much.