

Mattereum

Club Rules versus Rule Of Law

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I'm here today is really just to open up. I've been one of the people who have been very supportive of Mattereum, simply because I've never seen any technology that doesn't need human intervention at some point.



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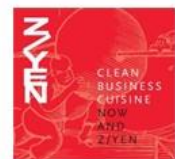
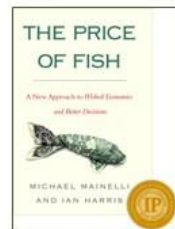
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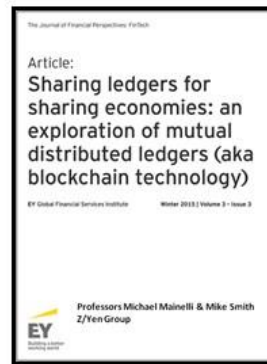
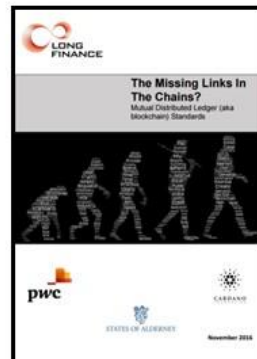
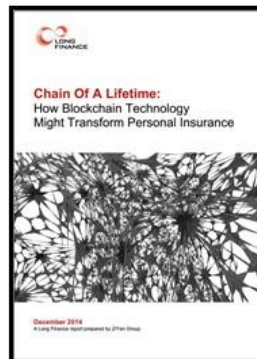


What I'd like to chat about this morning is very much the ideas behind what's going on in the smart ledger spaces. I run a firm in the City of London and, as you gathered from the grey hair, I've been doing it for about 40 years, and one of the things that I've seen is a lot of new technology come along and talk about displacing existing technology. I think that there are some lessons to be learnt from existing experiences, past experiences, but of course there is truth to "This time it's different," so the question is how we balance the two.



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Some Of Our MDL Research



Those of you who know us will know that we produce a lot of research online, and I'm not here to try and talk about it, but quite a bit what we've looked at has been, since 2011, what are these new governance structures. On the top left, for those of you who think this space is all brand new, our local government, the City of London Corporation, in 2010 commissioned our firm to do some research on what Bitcoin and many other digital currencies might mean for trade and commerce worldwide. I do repeat that that's not a mistake: 2010, published in 2011. We followed that up though with two very obvious avenues. The first avenue was a lot of work that we've done on standards, and these are not technical standards. Frankly, I must say, from my perspective, interoperability between these, as an old programmer, is pretty easy, these are flat files, and you probably shouldn't get out of bed in the morning as a programmer if you can't put two flat files together. But at the next level up it does get quite difficult. And actually, for a lot of folks out there who claim there are no standards... There are so many standards. As the old joke goes, the great thing about standards is there's so many of them and you can in fact use what you like, and we've been looking at that space. The other area we've been looking at has been very much governance.



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Outline

- ◆ Smart Ledgers - Identity, Document, & Agreement Exchanges
- ◆ 'Fast' versus 'slow' technology
- ◆ Humans in the loop – the role of Trust
- ◆ Clubs Rule?



“Get a detailed grip on the big picture.”

Chao Kli Ning

The first thing I want to do is explain why I am excited about the sector, and I'm afraid for those of you who are into ICOs and cryptocurrencies and all that, I have very little interest in them. I have a fraction of a fraction of Bitcoin, which I think Lloyd sent me once just to see how the process worked, I have absolutely nothing else, but I am excited about the sector and we'll go into that. The second thing I want to do is, for those who don't know my background, I spent about a dozen years in the Ministry of Defence, at one point, for a number of years, managing roughly about 40% of the UK Government R&D, and I can tell you that there's some deep lessons to be learnt there about the way that real technology gets developed. Then I want to talk about the main element of this Conference, putting humans back in the loop, and I want to give you an odd example from the City which is much overlooked, largely because it's so large and so quiet that nobody has noticed it for 200 years, and I think this could be a very useful paradigm for us to ponder as we're going forward with Mattereum.



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Terminology Evolving

- ♦ **ledger** – a record of transactions
- ♦ **distributed** – divided among several or many, in multiple locations
- ♦ **mutual** – shared in common, or owned by a community
- ♦ **mutual distributed ledger (MDL)** - a record of transactions shared in common and stored in multiple locations
- ♦ **mutual distributed ledger technology** – a technology that provides an immutable record of transactions shared in common and stored in multiple locations
- ♦ **blockchain** - “a transaction database shared by all nodes participating in a system based on the Bitcoin protocol”
- ♦ **smart ledger** – MDL with embedded, executable code

The terminology is a bugbear in this space, I'm conscious. These are, in my opinion, ledgers, they're boring, and these are multi-organisational databases with a super audit trail, so you can call those kind of mutual distributed ledgers. If you put some stuff on top of that in terms of smart contracts or cryptocurrencies, smart ledger is a general term.



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Smart Ledgers Hold Immense Promise

Area	Possible Applications
Financial instruments, records, models	Currency, private and public equities, certificates of deposit, bonds, derivatives, insurance policies, voting rights associated with financial instruments, commodities, derivatives, trading records, credit data, collateral management, client monies segregation, mortgage or loan records, crowd-funding, P2P lending, microfinance, (micro)charity donations, account portability, airmiles & corporate tokens, etc.
Public records	Land and property titles, vehicle registries, shipping registries, satellite registries, business license, business ownership/incorporation/dissolution records, regulatory records, criminal records, passport, birth/death certificates, voting ID, health and safety inspections, tax returns, building and other types of permits, court records, government/listed companies/civil society, accounts and annual reports, etc.
Private records	Contracts, ID, signature, will, trust, escrow, any other type of classifiable personal data (e.g. physical details, date of birth, taste) etc.
Semi-private/semi-public records	High school/university degrees and professional qualifications, grades, certifications, human resources records, medical records, accounting records, business transaction records, locational data, delivery records, genome and DNA, arbitration, genealogy trees, clinical trials, etc.
Physical keys	Key to home, hotel, office, car, locker, deposit box, mail box, Internet of Things, etc.
Intellectual property	Copyrights, licenses, patents, digital rights management of music, rights management of intellectual property such as patents or trademarks, proof of authenticity or authorship, etc.
Other records	Cultural, historical events, documentary (e.g. video, photos, audio), (big) data (weather, temperatures, traffic), SIM cards, archives, geostamping, etc.

I said that I'm excited about them. Why am I excited? Well, largely because they tackle the third party problem. The central third party in history has always been the way that we've traditionally organised transactions between people, and those aren't just financial transactions; those are educational transactions, those are transactions to do with property rights, water rights, etc. – we've always had a central third party. The difficulty with central third parties is that they have a tendency to become natural monopolies, if they're any good. Why have more than one land registry? Why have more than one fiat currency? So these central-led ledgers, these central third parties, therefore have a propensity, as any natural monopoly does, towards indolence – why bother to be better, I am number one – and corruption. What's been exciting for me has been the challenges that distributed ledgers give to this typical difficult problem that has existed for many millennia.

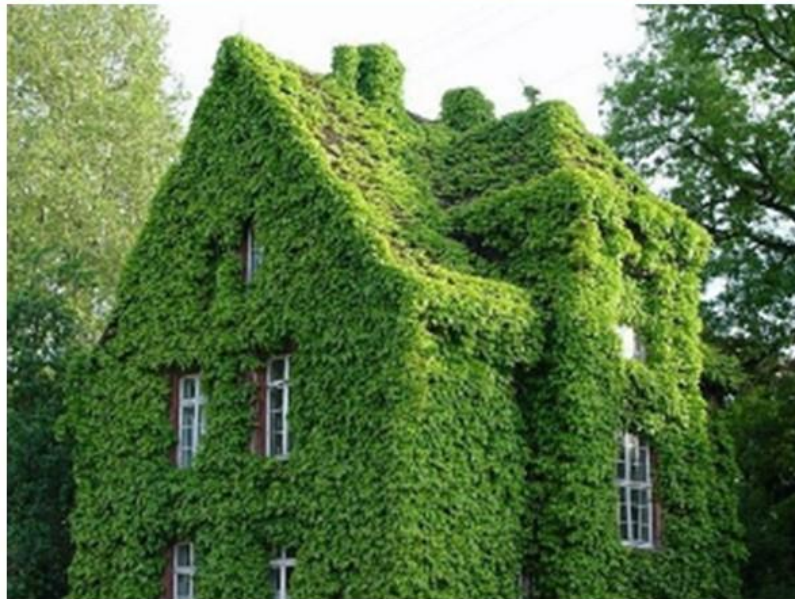
Identity, Documentation, & Agreement Exchanges

- ◆ Usable
 - visualisation, apps, XML partial matching engines
 - key structures, sprites (smart contracts)
- ◆ Mutual - validate
 - validation methods
 - 'genetic splicing' and integrity
- ◆ Distributed - safeguard
 - surveillance – support vector machines
 - transmitting & receiving, high volumes, multiple transmitters
- ◆ Ledger - preserve
 - immutability and standards
 - partial data holding, long-term data storage



In particular, what we're working on... Well, I see a much deeper substrate than cryptocurrencies. This is identity, documentation and agreement exchange. We have built quite a few commercial applications in this space, so that gives me perhaps some artificial confidence that this is moving forward. In fact, we're building a number of them, but I would pick on one which is down in the Far East, we're working with a very large insurer of five banks and two governments to build a gargantuan trade system, and we've just bench-tested the substrate in August for a trillion transactions today. That's the sort of level that I think we're trying to get to, is this ability to swap data authoritatively, swap agreements authoritatively, and record the state of things as they go forward, much more than just coinage. But that's our area, that's where we're coming from.

Fast versus Slow - Ivy Theory Of Technology Deployment



“Learn the rules like a pro, so you can break them like an artist.”

— Pablo Picasso

What are some of the lessons we've learnt? Well, the first thing for me is in many, many years of doing tech – and that's not just computing; that's physics, material science, genetic probes, spacecraft – I have never seen a technology take out an existing technology straight on, ever. It creeps up the edges of the house, it surrounds it, and if you come back 20-30 years later and the house is gone. So my excitement here is more in these areas where we don't have functioning identity systems, and therefore I expect them to kind of creep around the edges of financial services and trade. If we look at trading systems, if you take shipping, I was involved in the creation of Bolero back in the early 90s, Bolero is an XML trading system and is still going today, it's got some competition from another group, and yet people are out there trying to put distributed ledgers into shipping again, and I think that this might be a case where it works. Again, it will creep around the edges where we've never really had efficient trade systems. So I do see great potential for this, but it's not in melting down nations or in melting down commerce, in my opinion. But we'll have Trent up who I know has a very different view, and that's why we're here today, is to share those different views.

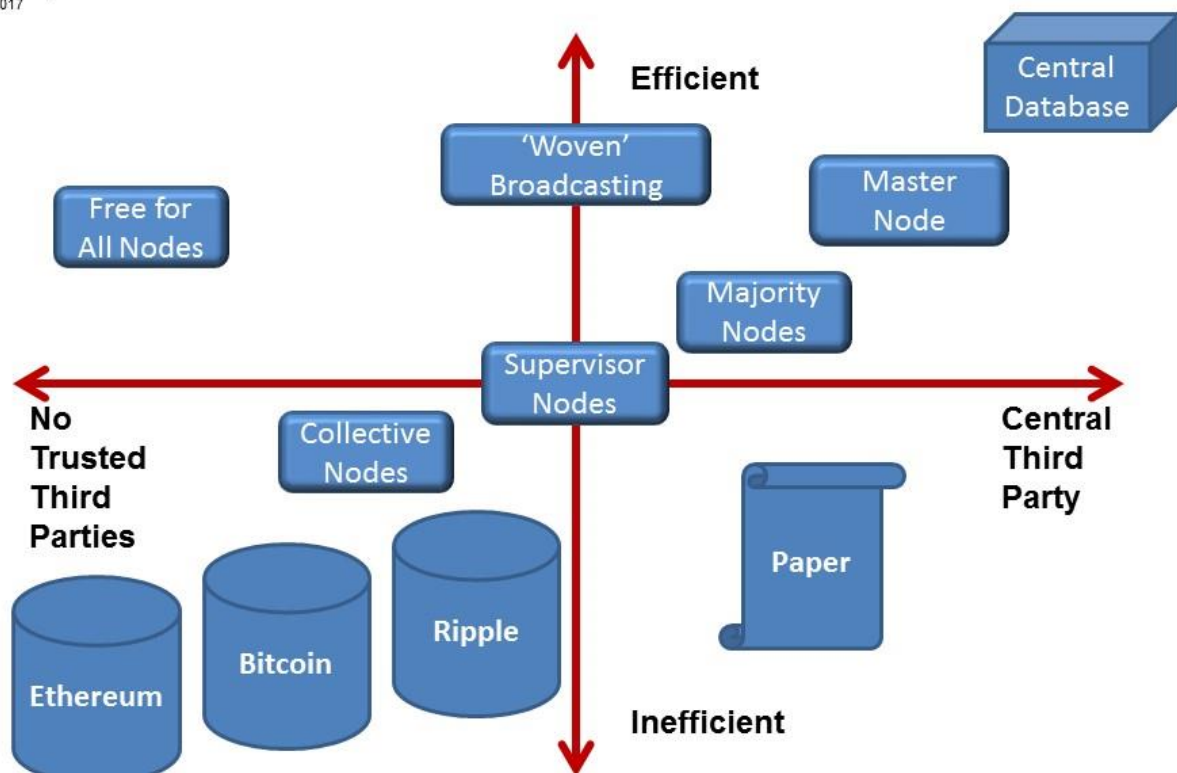
What Are The Perceptions Of Potential Users?

Issue	Description	Significance
Governance	Due to the persistence of data in MDLs, correcting errors may be difficult unless a single entity is authorized to promote changes across all nodes - requiring the need for trusted third parties again	High
Liability & Responsibility	Joint liability and indemnity for mistakes should be carefully considered when relying on shared information in high risk areas such as Know-Your-Customer, Anti-Money-Laundering, Sanctions Screening, and Ultimate Beneficial Ownership	High
Taxonomies	The 'Magic Beans Effect' - uncertainty around technology labelled as "based on MDL or blockchain technology" by developers	High
Compliance	Legality and enforceability of the records or code kept on MDLs as well as differences in privacy, financial and company laws across jurisdictions may make compliance more complex	Medium
Security	Malicious access to a public MDL, for example using a stolen key, would enable a hacker to gain access, not only to the information stored at the point of attack, but to the full breadth of information recorded on the ledgers	Medium
Transparency & Reporting	MDLs could add complexity to risk management and oversight in securities markets if data is encrypted	Low
Interoperability	There are currently no interoperability standards for MDL, thus there are potential barriers for trade unless this is resolved. However, interoperability will be a commercial imperative and is likely to be solved by market forces	Low
Performance	What are its characteristics? Is it fit for purpose with respect to speed, reliability, security, transparency etc?	Low

In the course of looking at governance this year, we actually went out and surveyed a whole group of companies, I think from memory it was about 270, and we asked them what they saw as the impediments to these distributed ledgers. You see here really three things dominated, and we're well above things like technical interoperability or functionality. They were very concerned with governance, liability & responsibility, and understanding what it was they were buying into. They had a lot of people come and say, "Well, I copied the Bitcoin blockchain or I copied Ares or I copied something, but that wasn't quite suitable so I then altered it. Well, then what do I have? Well, I've got something that I have 'improved'," so they wanted to understand what were the differences in the taxonomies and the provability of it. But also, I think quite rightly, they were concerned what if it goes wrong.

When I'm talking to a group of commercial people, they typically say things back like "Who owns this?" and then they push back quite a bit with examples like email, who owns email. Most business people actually don't understand how email functions, that it's really a cooperative effort, that 95% of the processing is really done in a completely different way than they think, and that if they wish to pay Microsoft at the tail end of it, that's sweet, but actually that system has been functioning in another way. On the other hand, this audience equally point out that there are legal problems with email, or you wouldn't see all of these disclaimers at the bottom of the email. There's a tension here between where does technology succeed in overturning existing inefficient structures, but we live in the real world, where people do sue each other and get sent to jail.

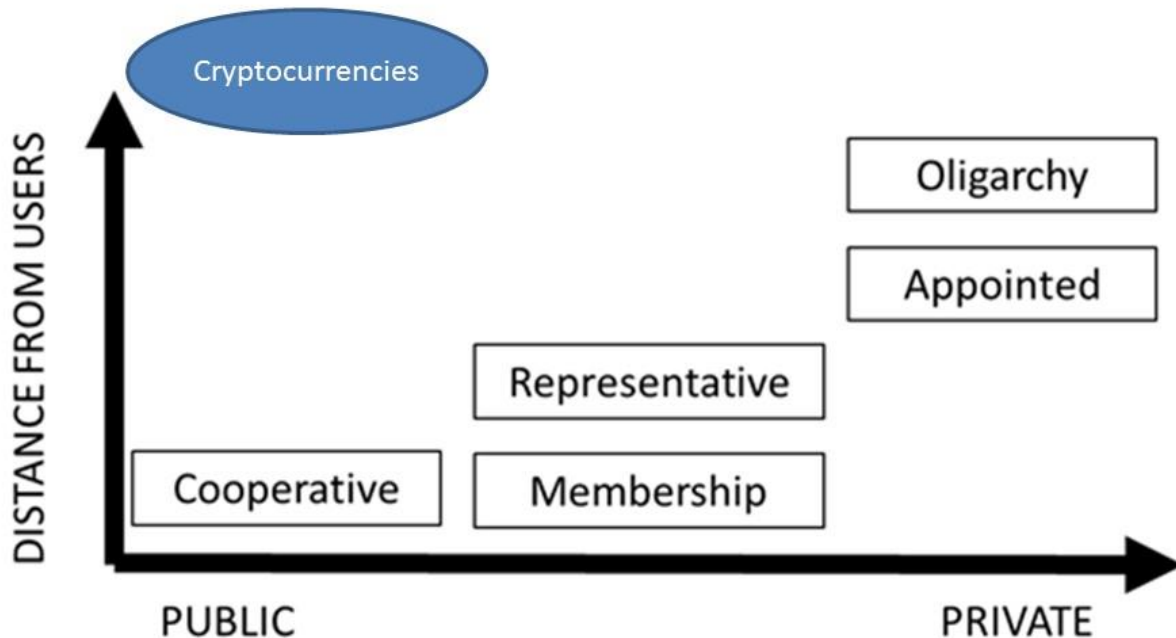
Myth – Central Third Parties Extinct



So, I would contend, if I might, first of all, that one of the biggest myths is that this technology is going to make central third parties extinct. I am open to saying I think it's fascinating that it moves through *this* top-right quadrant, where when I want to have a network of people doing some form of exchange using a central third party, they have the ultimate ledger and run through it... It weakens that position, and it weakens that because it takes away the preservation of a ledger and it takes away the safeguarding of the ledger, the ledger is now being preserved and safeguarded by everyone. But the addition of new transactions to that ledger is an area I think of great debate that we'll be having for many years, and in many cases the addition of new transactions is going to fall to some form of central third party. So we've weakened the central third parties, but I don't think we'll abolish them, and I'll come on to looking at two examples of that.

One of the things again I think we forget is when we're looking at user proximity to these types of governance structures... This diagram *here* is showing you on the right a central third party, which is a traditional case today, and over *here* Ethereum, Bitcoin and others are struggling to see if they can abolish central third parties completely. But in the middle of the commercial structures that people are looking at are highly variegated. If I get flamed one more time on Twitter or LinkedIn that I don't really have a blockchain because a blockchain works like this... The truth is there many, many different ways of constructing these ledgers. I might also point out to many of you that, in fact, if you really dig into the literature, and I've been doing a little bit of it but not sufficient... The best I've got so far is the 1978 paper out of Stanford which outlines completely the distributed ledger system, with blocks, with chains, the whole thing, so that bit of our revolution is not new. The mining, on the other hand, is fascinating, as it is to all of us.

User Proximity to Governance Structures



Let's have a look at governance structures. We got quite a few different governance structures, and cryptocurrencies actually kind of stand out in the fact that they're extremely distant from the users. You can't ring up the Bitcoin hotline, can you? I think if you ran the Ethereum hotline, Vitalik might answer it and take your concerns very seriously, because that's the kind of guy he is, but it would be a long way from getting your problem solved. We count on working from wallets and all sorts of things, we sort of assume that the technology has to work, but we make a lot of core assumptions there. But in the business systems we're seeing all kinds of different structures emerging, and some of them aren't particularly fair. If I'm in an industry with three major providers, take insurance, where three brokerages actually pretty much control the brokerage in that industry, we're not going to be setting up a distributed ledger where those three don't have some form of control over it, so we have the sort of oligarchic bit up there on the top right. Then we move down into sort of cooperatives, NGO-type structures in areas like forestry and fish and other areas that we're working in.

Trust Is More Than ‘Code Is Law’

Smart Ledgers sometimes described as ‘trustless systems’:

- ◆ Trust in the code that supports the protocols for the network and ‘smart contracts’.
- ◆ Trust that transactions will not be lost due to a ‘hard fork’, ‘soft fork’ or ‘roll back’ – “tyranny of the code” versus “tyranny of the majority”.
- ◆ Trust in the algorithms that protect security and privacy.
- ◆ For crypto-currencies, trust that other users will continue to believe in the future persistence of community valuation of a ‘virtual element’.
- ◆ Trust that in the case of disputes ‘all comers will be treated fairly’.

While these ledgers are sometimes described as trustless systems, I would argue that that’s facile. Almost all the practical systems that we’ve worked on really violate that, that the trust is wider than just the code. There is trust and we can talk about trust, I’ll come onto definitions in a moment, but is the trust the code and protocols? Is the trust that the transactions won’t be lost? Is the trust in the algorithms? Is it the trust that in the case of disputes all-comers will be treated fairly? Let’s have a look at that.

People Who Need People...

There will be problems that only humans can solve:

- ◆ Ricardian contracts and 'smart' contracts – data sources ('oracles') – create real coding issues
- ◆ Time – 'short and dumb' well before 'long and smart'
- ◆ Agreements more complex than payments – identity over time, promises over time, value over time, *force majeure*, volatility
- ◆ Synthetic jurisdictions
- ◆ Problems with enforcement

I would contend, and I think that's an important starting point for today, that there will be problems that only people could solve, I think this is absolutely the case. We can have Ricardian contracts, and we have the master here, Ian Grigg. Ian is going to be closing today with his presentation on Ricardian contracts.

You also have a lot of problems with things like data sources. A lot of folks out there are talking about oracles; in my opinion, they've never ever tried to build a real system to do it. In the late 90s we were building systems to do weather handling. You might not appreciate hearing this, but the UK National Meteorological Office is intriguing in that it claims that not a single one of its sites has ever been tampered with. I would think they are. The US Weather Service reports a 9% tamper rate annually. So, zero? That's a bit harsh. Further, they fix their data, because they know what's best. A bunch of hikers are up the top of a hill, there's 30 inches of yellow rain... That was a bit of a lame joke, but they alter it, because they know what rainfall would have been on that day up there. Do you want to base a contract on that?

In the city we had LIBOR. LIBOR is typically fundamental to 25 and 30-year swaps, and we all know LIBOR was cooked. Let's go back and try and write a smart contract, saying anywhere from 2005 to late 2012. When do you bug out? When do you bug out and say, "Hey, this LIBOR is no good?" By the way, if LIBOR is no good, what are you going to shift to? Are you going to shift to EURIBOR? What are you going to do when LIBOR is out of action for a day for just technical reasons? Think about writing the code for that. So now we have suddenly put all the data on the chain, and we wind up with... There are solutions to these problems, but they are not particularly more efficient than today's solutions, which is to let human beings interfere and get involved in the situation.

What are some of the other problems? Well, time. I've often argued that smart contracts are going to be short and dumb long time before they're long and smart. The reason I say that is I don't mind building a smart contract to handle the kind of data I'm going to release perhaps 24 hours later. But do I really want to lock myself up in a 25-year swap agreement based on a smart contract? I'm going to need a lot, many, many years of confidence in short and dumb before I decide to move towards long and smart. I think as well we're

looking at agreements are actually much more complex than payments, and as you move over time a few things become interesting. Corporate identities over time change, a lot. The company may stand behind a subsidiary for non-legal reasons, a company may abandon the subsidiary on a purely legal technicality. So who were you really contracting with, the parent or the subsidiary? We move into promises over time. "Well, when I promised to provide you with authoritative office data, that's before I've found out what they were up to.

What happens about value over time? We've had an experiment for years in long finance, we've been trying to build an internal coin, a coin that never loses value. But values are human, only people can ascribe value to something. So if people are the ultimate arbiter of what value is, if you believe values are absolutely fixed over time, you haven't aged the way I have. I have very different values than I had as a youth... Well, except for fast cars and women and the booze, but anyway, let's move on.

Then we get into areas like *force majeure*. At the time I decided to do this, it was legal to China... Whoops, it's not legal in China, and then just the whole notion of volatility. So we have all these synthetic jurisdictions, and then we have to enforce some of this stuff. I'm sorry, folks, it's not all carrots in the world; we need sticks too.

Original Position – Veil Of Ignorance

“...no one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength, and the like. I shall even assume that the parties do not know their conceptions of the good or their special psychological propensities. The principles of justice are chosen behind a veil of ignorance.”

John Rawls, “A Theory Of Justice” (1971).

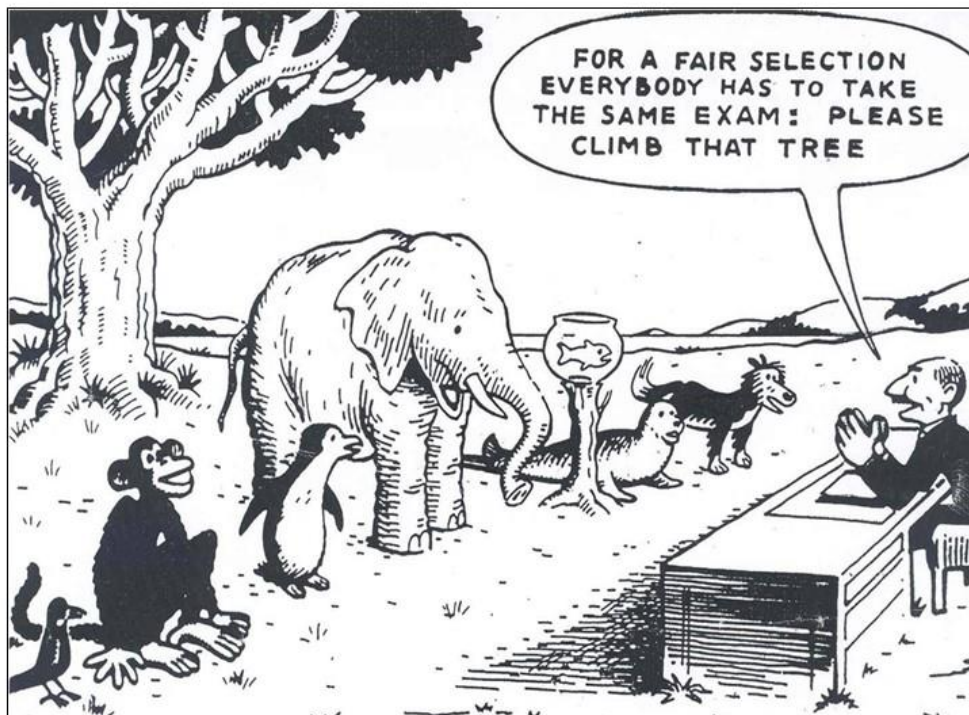


Let's have a look then at where we move from this. One approach, digging deep into philosophy, has been Rawls and his theory of justice. Rawls basically said is that what we want to have is a situation where there is what he calls a veil of ignorance. We start from the concept that if I were to put myself in the shoes of the person being judged, I would find that judgement fair, that is that the judgment doesn't rely on status or anything. I think that Rawls has a particularly interesting point here, the concept of what's called an original position, that by looking at an area of dispute, we want to ensure that justice prevails, and for justice to prevail it has to be seen to be just as well as it has to be just. We've heard those sorts of phrases before.



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One True Strategy For Success



“Treat All Comers Fairly”

I would sum it all up in this kind of cartoon which I rather like: “For a fair selection, everybody has to take the same exam: please climb that tree.” One of the things to me that has actually distinguished London over millennia is, with the exception of the expulsion of the Jews in 1290 and welcoming them back in 1655, London has actually been a very fair place; people would come here and be treated fairly, no matter where you came from, and the whole history of London is full of Jews coming back, it's full of people from Eastern Europe, these days it's full of Chinese and Russians. Folks believe that if they come here, they will be treated fairly, everybody has a common ground. I think this principle is very important for those sorts of things we're discussing today in terms of what are we going to do in terms of arbitration, mediation and expert determination.

Trust Equation

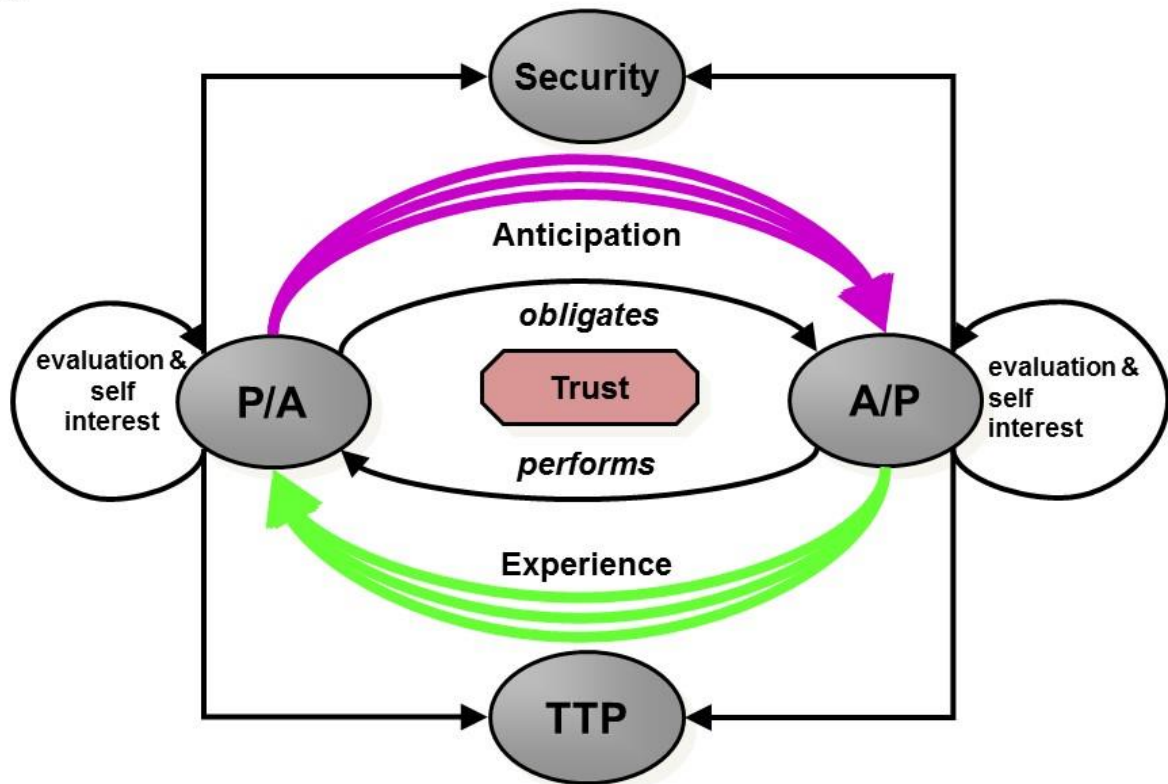
$$\text{Reputation} = \Sigma (\text{Experiences} - \text{Anticipations})$$

$$\text{Trust} = \frac{\text{Obligation}}{\text{Reputation}}$$

The second thing I'd like to do is, for those of you who like equations, I gave a lecture about 12 years ago on *Trust me, I'm Commercial*, and it forced me to really explore the nature of trust. Trust is a slippery word, it's possibly a dangerous word to use, but if you're going to use it, it would be kind of nice to break it down a little bit and almost turn it into an equation. To do that, I really had to start with reputation. Reputation is effectively the sum of your experiences with something minus your anticipation. I go to Waitrose, I buy a pint of milk and it turns out to be sour. I anticipated a nice pint of milk, but now I've got a sour pint of milk: I'm moving into negative reputation space. I go to Waitrose, I expected a pint of milk, and they say, "Well, actually, if you're having a pint of milk, here's a little sash made for your coffee. – Thanks, that's really kind of you!" So it's reputation minus your anticipation. And of course in many ways, when you get into something almost that's called a utility, this is when reputation is zero, believe it or not; you expect it to be there. You anticipate nothing more than your electricity turning on, and you get hyper frustrated and start banging your shoe when it fails to work.

So, what is trust? Well, trust is slightly different, otherwise it would just be reputation. It's actually the obligation over the reputation, and we say this in two ways. One element is if the obligation is nil and the reputation is nil, I trust you to cheat me. "You're such an evil person, I absolutely trust you to cheat me, and I trust him or her to cheat me," so that's one extreme. Another extreme is I don't really trust them very much, but they have a million pounds on the table, and all they have to do is make this phone call for me. So you see these swinging elements of obligation over reputation. Obligations tend to be twofold: one is pretty much financial, and the second one is in fact, oddly, reputation itself, diminishing reputation. We see this in our relationships often with consumer organisations, where they're trying to convince us that their reputation is so important to them that they would in fact never take our trust lightly.

Trust Theory



You can wrap this up in a lot more theory. *This* is an abstract diagram of really principles and agents, recognising that every agent is a principle and every principle is an agent, and you can see that you get repeated interactions here that build trust. I anticipate something from an agent and then they perform, then we get an experience... a series of interactions, but also two other things that a trusted third party can be injected into that diagram, and also some form of security or indemnity.



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Need A Human Structure

Mattereum will produce a set of affordable natural language contracts and corresponding smart contracts to facilitate common legal tasks like buying, auctioning and renting physical property, licensing and assigning intellectual property, and contracting for professional services.

Mattereum



Smart Contracts. Real Property.

What we're beginning to recognise is that in any reasonable type of system, we can't automate it completely; we need a human structure. That's why when Vinay approached me about Mattereum I became really quite excited, because it was an honest recognition that we could somewhat standardise what we were trying to do in that space. I think, in fact, Mattereum is really two bits: it's the idea that it's going to be producing natural language contracts, etc., but I think equally it's about putting in structures.

Comparable Characteristics?

- ◆ Human interpretation and valuation
- ◆ Evolving – case law approach
- ◆ International
- ◆ Low direct enforcement strength – high reputational enforcement strength



So, what are we looking for? We have a distributed ledger, it's handling some very important contract... At the moment, my wife is struggling with importing 800 little mannequins from China, and we do have a real problem, which is the Chinese, for some reason, reckon that we might skedaddle. I don't know if you're aware, but there was a period when a lot of heisters were going on to Alibaba and asking for samples, and the Chinese remember that. We have asked for some samples for Christmas, so they asked us to put some money up for the samples, vastly in excess of what they were worth, so we paid that. But when you're paying sort of 50 quid for something that you're hoping to buy ultimately for £4, just to have the sample... But that proved that we were good people with intent. Then they claimed that they've made it, now they claim that they've made it, and they want to put it and ship it to us in Hamburg, but they'd like payment upfront. These are the kind of real issues. What happens when the system bugs out? Well, then there's Alibaba. Well, my Chinese is passable, but it's not that good. Am I going to go to China and try and sue them? No. So we've got some very complicated situations here, where I would love for somebody to get ahold of their reputation, to be able, if it bugged out, to go and see them.

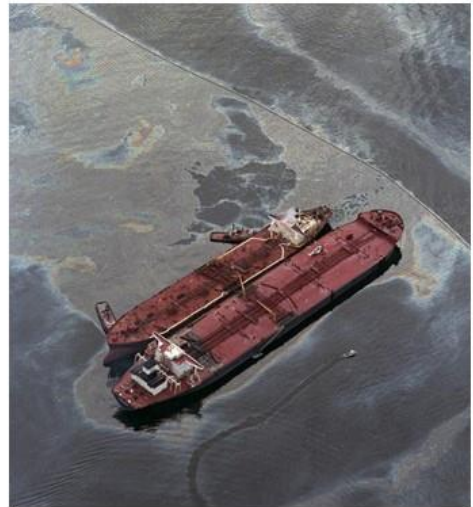
Now, remember that bugging out is a bit of problem. In the case of LIBOR, everybody starts to bug out just when you most need it. If suddenly everybody is saying, "I want to hold that contract," and I think this is one of the big issues looming in our space, is that the more we get these utilities up and running, the humans become a bit of a bottleneck. I think we could see, for example, hundreds of thousands of swaps being asked to be arbitrated all on the same day.

But what are we looking for? We are nevertheless looking for human interpretation to be injected into disputes. Also, evolution is really interesting here. We can't start out knowing everything, we have to evolve. Of course, one of the most interesting evolutionary systems, again based in the UK, is case law. Case law is an evolutionary system in which we handle disputes. Clearly the thing needs to be international, or my wife and I won't be able to order Christmas ornaments, this is crucial. But I think it's crucial to all the systems that we're talking about. I've never seen anybody saying, "I'm building a distributed ledger just for this local jurisdiction," everybody has international ambitions, quite rightly. And we've got a tension here, which is we've

got low direct enforcement strength. It's difficult for me to send those Chinese to jail, if they happen to be in any sense fraudsters. But on the other hand, I've got this difficulty of figuring out, diffused across the globe, where do I find that reputational register where I'm able to check their reputation? We've seen lots of struggles with this in eBay and Amazon. How do we handle reputation, how do we evaluate it, and how do we use it to drive better behaviour in a system?

Slick Operations

- ◆ Collision
- ◆ Wreck removal
- ◆ Pollution
- ◆ Stowaways
- ◆ Cargo damage/shortage
- ◆ Damage to fixed and floating objects
- ◆ Personal injury, illness, death



Well, there is an example. Does anybody recognise that? Exxon Valdez, spot on. It was a very slick operation. How was Exxon Valdez handled, one of the biggest oil spills ever? Well, funnily enough, Exxon Valdez falls under a particular class, that's the bulk of the claim, something called hull protection and indemnity insurance. I said earlier that there are in fact some existing structures. If you're in the marine industry, there are a couple of classes of primary insurance: the hull is insured, that's great, the cargo is insured so Exxon gets the money back for the oil, Exxon gets the money back for the hole in the hull. But who handles collision, who handles wreck removal? As we'll well aware the pollution costs were completely out of control. And then there's areas like stowaways, cargo damage and shortage, you can run into buoys and lighthouses and ports and terminals, which isn't covered in your hull insurance, and personal injury, illness and death. These are the wider areas and the bigger areas in insurance, and they're handled through something called P&I clubs.



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Buccaneering Clubs? P&I Mutuals



Mechanisms

- ◆ arbitration, mediation, expert determination
- ◆ standards, risk management
- ◆ investment and financial commitment

These P&I clubs begin really in the 18th century. They began initially, believe it or not, as hull clubs, but hull insurance became something that people understood and it went away. Then suddenly harbour masters were saying, "You're coming into my port. Are you insured? – Yes, I've got hull insurance and my cargo insurance is up to date," and the harbour master says, "I don't care about your hull, and I really don't give a damn about your cargo. What I care about is you running into my harbour wall or other vessels in the harbour, or polluting my harbour, or killing some of my staff." This led to the formation of these P&I mutuals. These P&I mutuals are in several cases well over 200 years old. Remember that shipping is about 6% of global GDP, and these P&I mutuals handle over 90% of global shipping, by vessels and by tonnage, and none of you know about it, I suspect, or very few. Does anybody here know about P&I mutuals? This is the way that the real world works, folks. It is human interpretation and evaluation, it uses an evolving approach based on cases, it's very international. Its ability to actually handle or sue shippers is quite limited but really relies on reputation. I've been in rooms where little, four-foot high Greek women in black dresses have been screaming at people, that they refused to take a lower deductible, "Because our family has been in this business for 200 years, and tough on you, and you, Maersk and all that, really better shape up your acts," so it's all based on reputation.

It works in another interesting way too, which I think important for the smart contract approach, is that no, they don't pay everything upfront. They put up just a little bit of money to cover what they expect will happen in a year, which should be manageable. But if it turns out to be something very large, like Exxon Valdez, they've effectively pledged their balance sheets. So if somebody comes and says, "You paid two million for your insurance at the beginning of the year. Guess what, there was this accident off Alaska, and Exxon is part of your club. Oh, and you owe another 10 million." And why is that? Well, because these people are in it for the long term, so they're really trying to set up trust structures that work.

What are some of the mechanisms there? Well, I think today we're going to talk about human adjudication, in terms of arbitration, mediation and expert determination, but they do a number of other things too, and I picked two broad areas. The first is these are giant risk management engines. The P&I mutuals

share huge amounts of information with their members about what works and what doesn't work. Take my case earlier on China: If I'm trying to import from China, they might tell me, "You should never deal with these people in the first place." I'll give you just two examples. For example, they might indicate that a crew of a particular nationality should never be picked up. Why is that? They don't care about the legal implications of the workforce. These crew just turn out to be pirates most of the time, so they just refuse to insure crews from certain countries, that's it. Do they need any more reason than that? No, they're protecting the members of the club.

Another good example is a club called the Strike Club, the Strike Club provides industrial dispute resolution, and we're club members. I'm coming into a port and Vinay is coming out, Vinay radios me and says, "Actually, the port is going to have a strike on the railways and you shouldn't go in." I go into the port anyway, and I now make a claim. Well, Vinay is paying part of that claim, so he says, "This Michael guy is a bit unscrupulous, he really should have not gone in, and I told him not to go in because I knew there was a strike coming." I've made my claim, and then we have a rulebook, not a law book, and the rulebook has a nice vague clause in it "under reasonable circumstances", and so they deny my claim. "You knew perfectly well, absolutely perfectly well that there was a strike coming on, you shouldn't have gone in." I then say that, "Actually, I'd like to be judged by my peers." We get a bunch of shippers together, I explain that my propeller was out and I really had no choice but to limp into port and get it repaired, and got stuck in the rail thing. So a lot of human interpretation in a case that lawyers would love to talk about the technicalities, but shipping people have got better things to do, like run a business, so this is the way that they operate.

The final thing is that they do get into a lot of investment and financial commitment type approaches, some of which can be quite complex, but really just designed to ensure that people are motivated to reduce risk for the entire group and increase the smooth movement of shipping.



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'Rule Of Law' Is More Than Law

Mutual insurance
'club' structures may
become the base
structure for many
Smart Ledger clubs



The London P&I Club

P & I RULES 2017-2018

SUMMARY OF CLASS 5 RULES

1 Introductory	19 Time-Bar
2 Calls and Premiums	20 Bail
3 Right to Recover and Subrogation	21 Powers of the Association relating to the handling and settlement of claims
4 Unreasonable Conduct	22 Settlement of claims
5 Application for Insurance and Conditions	23 Co-Assureds and Other Assureds
6 Certificates of Entry and Endorsement Slips	24 Affiliates and Associates
7 Less than full tonnage entered	25 Fleet Entries
8 Classification, Inspections of Ships and Statutory Requirements	26 Assignment
*9 Risks Covered	27 Period of Insurance, Termination by Contractual Notice and Novation
10 Special Cover for Charterers	28 Termination upon Sale, Loss, etc.
11 Limitations on Cover	29 Termination upon Insolvency or Liquidation
12 Other Insurances	30 Termination
13 Exclusion of damage to entered Ship, loss of hire, sanctions, etc.	31 Reinsurances
14 Illegal, Hazardous or Improper Adventures	32 Annual and Supplementary Calls
15 Liability excluded for War Risks and Nuclear Risks	33 Overspill Claims/Calls
16 Guaranties, Certificates and Undertakings	34 Closing of Policy Years
17 Exclusion of Risks arising from Salvage and Specialist Operations, Drilling Vessels and Waste Disposal and Sub-Sea Activities	35 Payment of Calls and Premiums
18 Obligation of the Assured in respect of claims	36 Release Calls
	37 Laid-Up Returns
	38 Reserves
	39 Investments
	40 Provision for Expenses
	41 Notices
	42 Forbearance
	43 Jurisdiction and Law

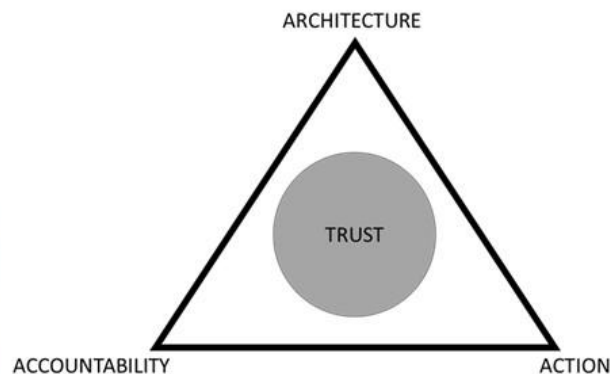
* Summary of Risks Covered under Rule 9:

9.2 Liability to Persons other than Seamen	9.16 Towage
9.3 Injury and Death - Seamen	9.17 Indemnities and Contracts for other Services
9.4 Illness - Seamen	9.18 Wreck Removal
9.5 Wages and Shipwreck Unemployment Indemnity	9.19 Cargo
9.6 Repatriation and Substitutes	9.20 Irrecoverable General Average Contributions
9.7 Diversion	9.21 Ship's Proportion of General Average
9.8 Spouses and Children	9.22 Property other than Cargo on board an Entered Ship
9.9 Stowaways, Deserters and Refugees	9.23 Fines
9.10 Life Salvage	9.24 Confiscation
9.11 Effects of Seamen and Others	9.25 Official Inquiries
9.12 Quarantine	9.26 Special Direction of the Committee
9.13 Collision with Other Vessels	9.27 Sue and Labour and Legal Costs
9.14 Property not on board an Entered Ship	9.28 Omnibus Rule
9.15 Pollution	9.29 Special Cover for Salvors

I think the biggest thing for me is that the rule of law is more than the law. I titled this talk at the very beginning *Club Rules versus Rule of Law*, and I think if we're going to look practically, pragmatically, what have you, at the types of structures that we'd like to and want to build into the system, we have to put rule of law sort of towards the bottom. Because although it's absolutely a fundamental foundation, and I do mean that, it is absolutely a fundamental foundation, nevertheless, we should get there as infrequently as possible, and that requires us, in my opinion, to look at good club rules, and those club foundations I think really do revolve around... By the way, that's a typical P&I club table of contents, covering things like overspill claims and all that, all written in a relatively non-legalese club book. This is your local golf club; this is not a legal contract.

Club Foundations

- ♦ **Architecture**: composition, remit, powers, responsibilities, and relationship with users.
- ♦ **Accountability**: transparency and predictable in decision-making, strong ethical foundations, independent justice.
- ♦ **Action**: strategic and risk management plans, independent verification of performance and reporting.



Then we move on to how we're going to get there. Well, today I would emphasise really three things that we picked up doing our governance work earlier this year. I would argue that the first thing we need to think about is the architecture that Mattereum is going to have in terms of composition, remit, are there any powers... If there is power, are we exercising soft power in the sense of reputation handling? I think secondary is accountability, how do we make this accountable. As the system is functioning we move further and further out, one of my observations is things become more and more transparent. When you get a local fine for speeding at the local magistrate's court, you may have felt that you were dealt with properly or something, but it kind of doesn't matter in the big scheme of things. But things get more transparent as they rise up the system, and then we're going to have to think about that, because we're immediately bugging out to more accountability.

Finally, what are some of the actions we're going to take? I think some of these actions are probably more beyond just bugging out. I think we're learning from these P&I mutuals that a lot of what people want is information back in advance to reduce the risk, not just to handle actions that have gone bad.



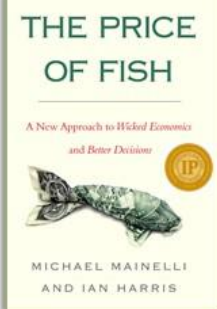
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When Would We Know Our Commerce Is Working?



“Get a big picture grip on the details.”

Chao Kli Ning



Thank you!



I'd like to conclude by saying my opinion. I think that Mattereum is a very important initiative, any of the initiatives to do with finding ways to make human supervision and governance of these systems more competent is to me a good initiative. I think that Mattereum is more than just having a bunch of natural language contracts; it's also designing an appropriate system. I would encourage all of us to look to the 200-year plus history, looking at P&I mutuals as a good international example that is working for a significant chunk of GDP today. In fact, that most of you haven't heard about it is a really good thing. Thank you!