

# SIX STANDOUT START-UPS FOCUSED UPON BLOCKCHAIN CLEARING AND SETTLEMENT 2

After yesterday's blog generally about blockchain use case implications in Clearing and Settlement markets, here are the six companies I see as being at the forefront of changing the game: Digital Asset, SETL, tO, Clearmatics, Symbiont and itBit.

## Digital Asset

Digital Asset – also known as Digital Asset Holdings (DAH) – is the most notable of the new players in this sphere, primarily because of their charismatic CEO Blythe Masters. Blythe was previously a senior executive at J.P. Morgan. She left J.P. Morgan in 2014 after a career spanning 27 years where, from 2012, she was responsible for Corporate & Investment Bank Regulatory Affairs. The real reason why most take note of DAH is because of Blythe. For example, from Bloomberg in 2013:

*Blythe Masters is the most recognizable woman on Wall Street—and arguably its most resilient. At 44, she heads the largest commodities trading operation at the largest bank in the U.S., JPMorgan Chase. In the mid-1990s she developed and marketed credit derivatives, which rapidly became a new wonder of high finance. These contracts—in which sellers agree to compensate buyers if specified loans go into default—were supposed to disperse risk and spur additional lending. They did that, but in the hands of reckless buyers they also blew huge holes in balance sheets. In a September 2009 list of “100 to Blame” for the global economic mess, Vanity Fair ranked Masters No. 65, just behind convicted Ponzi mastermind Bernard Madoff.*

Anyway, all that's by the bye, let's get back to the company DAH and what they're up to. Blythe became CEO in Q1 2015 and just under ten months later announced a \$52 million from investors including JPMorgan, Goldman Sachs, CME Group, ICAP and IBM, but the most important investment partner turned out to be the Australian Stock Exchange (ASX) who placed \$10 million into the coffers. Beating off 400 other contenders, DAH won the deal to replace the ASX's Clearing and Settlement system with their blockchain based service.

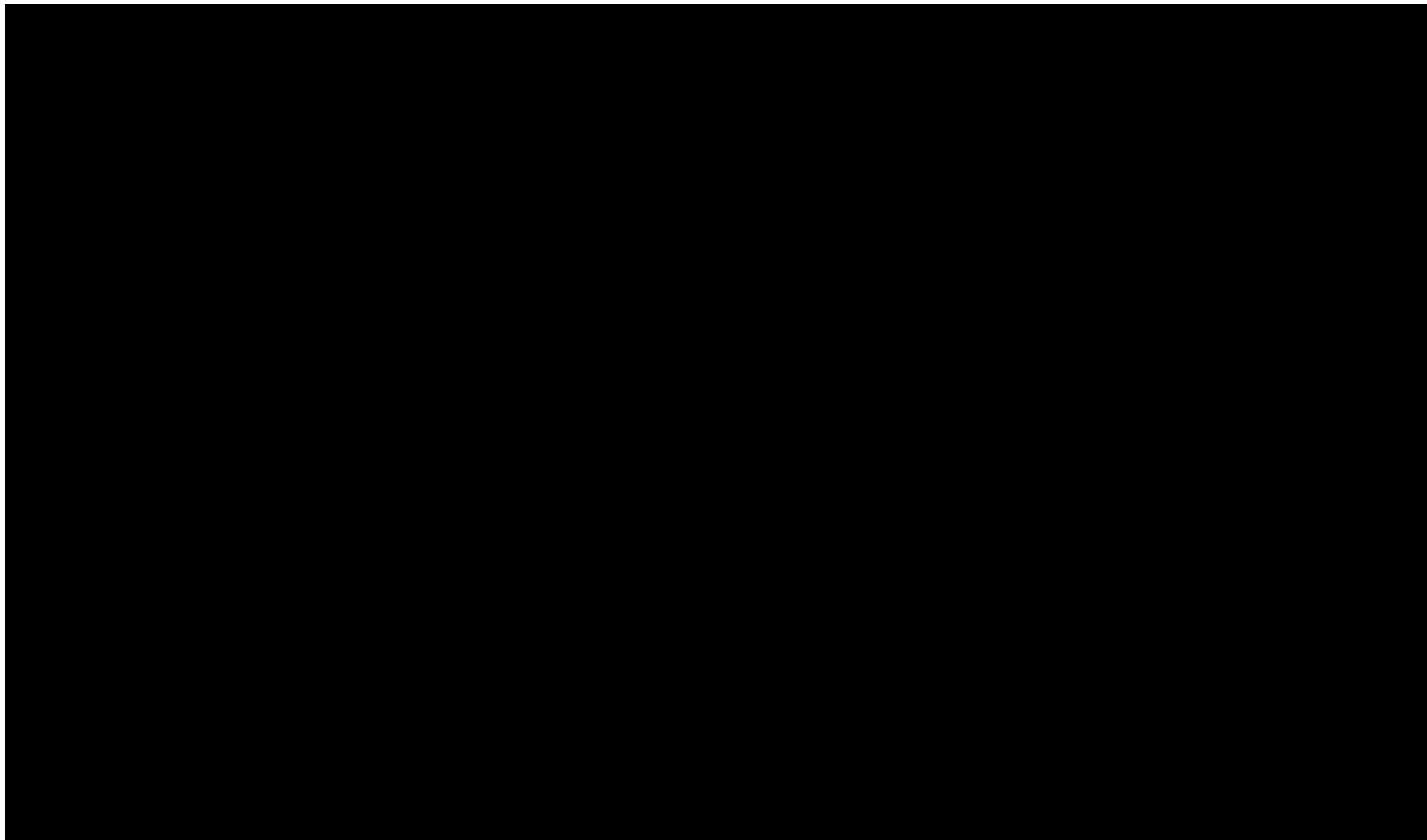
“We can now trade equities in 150 microseconds, then it takes two days to settle. That makes no sense,” Elmer Funke Kupper, Chief Executive Officer of ASX, said in at the time. “A retail investor in Australia should

be able to sell their shares, go to the nearest ATM and get their cash out.”

Notably, ASX pumped a further \$4 million into the company in June, saying that while there were a large number of blockchain developers, “relatively few ... understand its application to financial markets”.

This is a key aspect of what we’re seeing with blockchain in banking, companies must understand the complexity of the financial markets **and** the technology. Too many understand banking but not blockchain or understand blockchain but not banking. That is why DAH is winning. For example, more recently, the DTCC has announced a trial of DAH for repo clearing.

If you want to understand what Digital Asset does, then this video is worth a watch:



If you don’t have time then, in a nutshell, Digital Asset is a developer of distributed ledger technology for the financial services industry by building distributed, encrypted straight through processing tools. Their technology claims to improve efficiency, security, compliance and settlement speed.

Since launch, Digital Asset has acquired four complementary companies: Hyperledger, Bits of Proof, Blockstack and Elevance. Last year, the firm became a founding premier member of the Linux Foundation’s open source Hyperledger Project, with the objective to drive the adoption and standardization of distributed ledger technology.

Based in New York, Digital Asset has offices in London, Sydney, San Francisco, Zurich and Budapest.

## SETL

SETL was launched in July 2015 with the aim to offer a multi-asset, multi-currency institutional payment and

settlements infrastructure based on blockchain technology. The SETL system allows market participants to move cash and assets directly between each other, facilitating the immediate and final settlement of market transactions. The SETL system maintains a permissioned distributed ledger of ownership and transaction records, simplifying the process of matching, settlement, custody, registration and transaction reporting.

In June, SETL launched OpenCSD. OpenCSD is one of the first products that lets banks develop a blockchain product, rather than building it completely from scratch. It has financial grade security and built-in features to help banks verify the identity of who they're dealing with and message each other. OpenCSD is available on a subscription basis although a price has not been given. Banks and other financial institutions can access it through an API. Projects could be up and running within 12 months, according to Bloomberg.

Since SETL launched, it has announced it was in the process of raising £30 million and is led by Peter Randall, the man who created Chi-X. You may not be familiar with Chi-X or, as it is now known BATS Chi-X, but ten years ago this was a consortia-led equities trading platform that took over the algorithmic trading structures of Europe. Today, 1 in 4 investments in European companies takes place through Chi-X, so Peter's a man with form. Not only is SETL being led by Peter Randall, but he's being joined by City Veteran Sir David Walker as Chairman. Sir David also has some form, having been an Executive Director of the Bank of England; Chairman of Barclays Bank and Morgan Stanley International; as well as a Deputy Chairman of Lloyds. Other executives on the board of SETL include Rachel Lomax, former Deputy Governor of the Bank of England and Ed Richards, former CEO of Ofcom. In other words, from a market structure viewpoint, SETL should be taken seriously.

Not much is known about what they are launching yet however. From a technical view, it is unclear which blockchain technology SETL will use, but Peter claims that it can process millions of transactions a second, so it's definitely not Bitcoin. All we do know is the headlines and comments, primarily from Peter, which are definitely worth a read. From *Business Insider*:

"The current clearing and settlement system is a form of sophisticated Morris dancing. It takes a long time, every leg has got bells on it, and it's not understandable to anyone watching it outside of the system but everybody within the system knows exactly what they've got to do. It's expensive and slow and effectively a sort of rural industry."

True.

**t0 (Overstock)**

I was going to write a long overview of t0, but found this discussion on *The International Business Times* (*IBTimes* for short) far more interesting:

Patrick Byrne, CEO of Overstock.com and t0 (tee zero), can claim the only project that has brought the spirit of Bitcoin and real decentralisation to capital markets, as opposed to a half-way approach that changes a bit of reconciliation here and there.

Byrne spent longer than a decade trying to arraign Wall Street for its iniquities, during which time he was smeared, investigated and written off as insane, only to see the whole system come crashing down because of the very things he was railing about. He is conciliatory in vindication, however. In an interview given to IBTimes, Byrne said:

“I’m not trying to start fights anymore. And I’m not in the business of bayoneting the wounded. I feel the blockchain revolution is kind of my victory. I don’t care whether I win it, someone else wins it. The fact is the blockchain revolution is going to accomplish all these things I was after 10 or 12 years ago.

“And actually when I’m at these financial conferences speaking, I feel kind of awful for people, frankly, because I think this is an extinction event. I think that in five years a very significant fraction of people and companies are going to be so disrupted. I feel I’m looking at people, many of whom are going to lose their jobs. I have this great sympathy for these people I used to be fighting.

“But it is time. This is a healthy change.”

### *Netting*

Byrne believes net settlement to be “the original sin” of capital markets infrastructure. He said the t0 system is designed to do gross settlement. “We could also do net settlement but we have designed it to be gross settlement, or what we call true settlement, because the public will understand that better,” he said.

In the current system, when you buy some shares in a company, rather than a straightforward exchange, everything is entered into a fungible pool of shares that feeds another fungible pool of shares and everything gets netted at the end of the day. This process is facilitated using a system of IOUs whereby property rights and legal ownership of the shares have been divorced from the entities being transacted.

“To me, that’s the great original sin, once you divorce those two,” said Byrne. “We laugh at the Soviet Union for trying to run a society without property rights. But we have taken a whole financial market and our

capital markets of the civilised world; we have taken property rights and we have securitised them, and digitised them and hypothecated and re-hypothecated and pre-netted and netted and sliced diced and circumcised ... and the system has lost track of who owns what. It's another great offence to me that the system can lose track of who owns what. And to be honest that's part of what happened in 2008."

### *Freezing*

The financial collapse of 2008 was a series of events, a large part of which has since been described as a settlement crisis. The big banks reached a point where nobody knew who they could trade with and the system froze. This key event happened a couple of days after the collapse of Lehman Brothers.

Commentators such as Dr Adam Back, the chief scientist at Blockstream, have pointed out a blockchain architecture would have allowed banks to keep lending despite the crash conditions; this view was more recently echoed by the CTFC.

Byrne said: "People didn't know where they could trade. When everybody owes each other IOUs that can be in multiple places at once, that's how the system couldn't tell any more who owned what and who owed what to whom.

"Blockchain could have prevented 2008. But it could only do that if you built it with gross settlement and didn't rebuild net settlement into it. There is absolutely no reason in the world of blockchain to build in net settlement. It's like saying you have got a new Ferrari and we are going to put a lawnmower engine in it.

"There's no technical reason you would do that. The only reason is, that it's in those points of net settlement that various opportunities for mischief occur. Wall Street sees there's new age coming, a new blockchain age, and they want to see those cracks – those opportunities for mischief – to be built into the new system."

### *Shorting*

Wall Street veterans like to argue that a pure blockchain design, and with it a move towards instant settlement would result in a fearful level of information leakage into the marketplace. An often cited example is short selling, where securities repatriated too quickly will leak critical information to the market's most sophisticated investors. Short selling creates large amounts of liquidity, these people say, so another solution will have to be found to preserve it.

Byrne said: "First of all, that position is the industry's attempt to use gibberish to confuse the issue. I would say that the current system doesn't protect the retail investor; it doesn't protect them from signal leakage;

there are already all kinds of signal leakage and information leakage. There's a whole industry – high frequency trading – which has arisen to front-run based on signal leakage. So, that whole argument is nonsense.”

The current short selling system allows a stock to be two places at once. To do so creates a “phantom supply” in the marketplace. It amounts to fractional reserve banking without a reserve requirement. Byrne recommends ontological parsimony. “Our system prevents that from happening. It's either here or it's there; if I loaned it to you then before I sell it, I have to get it back from you. It makes it impossible to do fractional reserve banking with shares of stock. Because you know what – you shouldn't be able to do fractional reserve banking with shares of stock.”

As far as the claim that this activity creates liquidity in the market, Byrne added: “That's not liquidity; it's volume: the idea of having a system where you can have one share of stock appear in multiple places at once, and that people can daisy-chain, so it can be at countless places at once.”

The t0 system has come up with an elegant solution in the form of a shorting token which addresses opacity in the market. Byrne explained that the beneficial owners give t0 an attestation as to their inventory that is segregated and at the end of the day this is tokenised. The tokens represent the right to borrow and short sell a share. A reverse auction is run overnight and at eight the next morning the winners get their tokens.

“This is actually better than a locate,” noted Byrne. “If you have a locate on stock you can short sell, but if you short cover, theoretically you are supposed to go back and get another locate. For the high frequency guys that doesn't work; it introduces latency as they have to keep going back and get another locate. This, however, is a pre-bar; you can short cover all day long.

“It solves a problem for the beneficial owners who are getting the real price, the real negative rebate for that inventory they have; the short seller isn't paying some price negotiated with his prime broker, but a real price made on a public exchange.

“And the regulator has a much easier job because instead of applying this vague language about ‘did the short seller have reasonable good faith and all that nonsense’ it comes down to an easy question of did you have a token or didn't you have a token. The folks in the middle might not be too happy because that's their big spread,” he told Tabb Group in an interview.

Finally, notably, Overstock recently gained approval from the SEC to issue cryptosecurities which will settle



on the blockchain. While no issue date has yet been determined, the e-commerce company is effectively making itself a litmus test for blockchain as a real world settlement mechanism.

## **Clearmatics**

Again, I'm deferring to *IBTimes*:

London-based Clearmatics uses a distributed ledger system based upon Ethereum and is focused on bringing efficiency and transparency to Over-The-Counter (OTC) securities markets.

Ethereum allows a large network of machines to share a decentralised ledger which contains not only data but, in essence, runs computer programmes as well. You can think of it as a “consensus computer”. OTC markets involve securities trading which is not done on formal exchanges, but rather carried out by broker-dealer networks in the form of bilateral contracts negotiated using computers or by phone. OTC markets, while already partially decentralised, are known for being mostly opaque and market participants face an advancing tide of regulation calling for increased transparency.

The use of closed consensus blockchain systems to update the mechanics of financial trading has become one of the busiest spaces in FinTech. Some players have aligned themselves with existing intermediaries and seem to be looking at a distributed ledger at the bottom of the stack that gets rid of reconciliation and enables some real time settlement.

The Clearmatics vision for OTC markets is different. CEO Robert Sams told IBTimes: “The vision that we are working on is to turn the post-trade life cycle into a bunch of different member-run utilities. So instead of having post-trade intermediation, you have got a membership-run network that automates the post-trade lifecycle without third-party intermediation.”

### *Regulations and transparency*

Trade Capture Platform (TCP) intermediation is on the cards by virtue of a plethora of rules including Dodd-Frank and the European Market Infrastructure Regulation (EMIR), not to mention MiFID II with trade and transaction reporting. Within the next few years market participants will not be able to do a trade without reporting it.

Sams said: “The opacity of the OTC market is something that is going to have to go away. The regulators are going to push in that direction anyway. What I say to all the people in the OTC landscape, if we don't go

down a model like this and make the OTC market more transparent, you are going to lose the whole bilateral nature of OTC and everything is going to be intermediated; the pre-trade is going to go from dealer model to central limit order books; there will be vertical integration between central counterparty clearing houses (CCPs) and exchanges and then your market will disappear.

“So people might say – ‘oh I like the fact that I can do a trade and nobody has to know about it except my counterpart’, but the handwriting is on the wall; The opacity aspect is disappearing anyway.”

### *Netting and blockchains*

How the netting of securities settlements will integrate with a distributed ledger model is an interesting problem which can elicit a variety of responses, depending on who you ask. Some people think blockchains will remove the need for netting entirely and do everything on a gross basis. Strictly speaking, within the OTC derivatives space it’s not really netting; it’s called “trade compression”. This effectively does the same thing, only it happens at a different stage because derivatives span the life of a contract, unlike a spot trade where once it’s settled, it’s settled and finished.

“I think the netting topic is really interesting one that the technology offers elegant solutions for,” said Sams. “With a derivatives contract you’ve got margining that happens over the life of it. The trade compression is something that happens in the middle of that life cycle. For instance, one party goes into the trade with Goldman Sachs; he goes out of the trade with JP Morgan; he needs to use novation to compress those trades to get them off his balance sheet. So the process is different but economic function of it is the same.”

To anyone who thinks blockchains will do away with netting in favour of a gross settlement system that’s constantly updated and transparent, Sams suggested the following example: “Say you are a fund manager and you have got 40% of your assets in bonds, 50% of your assets in stocks, and 10% of your assets in cash. Let’s say that you want to do a re-allocation of like 20% of your portfolio. So on this gross-settled model you are going to have to sell at least 10% of your exiting portfolio before you can buy what you want to buy. It’s a completely ridiculous kind of implication and I think people are not realising that having an interval between trade and settlement, whereby you net everything that happens between that interval, is part of the way markets work. It provides liquidity; it provides a little bit of leverage, and you cannot get rid of that.”

He said we can expect to see shorter netting windows, where the time between trade and settlement will be



shorter than it is in a lot of markets, but this will not remove the distinction between trade and settlement.

“There will be an interval and there will be netting in that interval. The idea that trade and settlement can be made into a single event is just incoherent.”

*What does a smart contract mean to you?*

Sams is good at unpacking what he sees as some unhelpful semantics, especially around the concept of “smart contracts” and distributed ledgers. “What does a smart contract mean to you? If it’s just server-run automation of some contractual obligations, then the technologies run by clearing houses have been doing smart contracts for decades. For that matter, so have vending machines”.

The real issue, according to Sams, is whether contractual obligations can be automated using technology that is not run by a third-party intermediary like a clearing house but instead by the counterparts to the contract themselves. “If the term ‘smart contract’ is to refer to a new innovation, then it should be confined to programs that are consensus-computed. Server-computed contractual obligations are ubiquitous, it’s nothing new, even if that automation happens to talk to a distributed ledger.”

Sams’ thinks that some types of Distributed Ledger Technology (DLT) could, paradoxically, lead to greater concentration of intermediation in the financial industry. “If a DLT technology doesn’t have programmable ledger state transition, then all of the business logic required to automate the complexities of the post-trade lifecycle will have to be computed by someone, and that someone will in effect become a monopolist gate-keeper of the golden record.”

*Automation without intermediation*

So according to Sams, we need to choose our DLT stacks carefully to get socially desirable results. “The goal is automation without intermediation, and OTC markets are an obvious candidate for technology that enables this. Commercially, it is the holy grail for both the buy-side and the sell-side, and the regulators should see this as an opportunity to increase transparency and reduce the concentration of counterparty risk. But it’s not necessarily a great outcome for the post-trade guy in the middle.”

It should come as no surprise that Sams is critical of derivatives CCP’s, and thinks that the debate around OTC derivatives regulation needs to be informed by what new technology enables. “It’s important to realise that the socially desirable features of Dodd-Frank and EMIR – mandatory collateralisation, standard margining models, and trade/transaction transparency – can all be achieved without requiring that

everyone face a CCP.” And according to Sams, CCP’s are themselves a potential source of systemic risk. “It’s an exceedingly odd way to mitigate counterparty risk, making everyone become counterpart to an institution that is obviously too-big-to-fail. The model is pregnant with moral hazard.”

## **Symbiont**

I know, I know. I should write my own stuff but c’mon. *IBTimes* got the news again:

### *SmartLoans*

Mark Smith, CEO of Symbiont, believes smart contracts are the killer app of blockchains and that the ledger layer will soon be thought of as a commodity. Putting Symbiont’s smart contracts to good use, the company has announced a deal with Ipreo’s loan settlement platform to overhaul antiquated and costly manual processing in the \$3 trillion global syndicated loans market.

Settlement periods of 20 business days or more threaten the continued growth of the loan market. For the sell side, the delays tie up precious capital; for the buy side, settlement uncertainty confounds cash management and necessitates costly credit lines. Symbiont is developing “SmartLoans”, based on smart contracts for the loan market.

### *Netting*

Smith said netting is a good example of something that cannot be solved at a ledger level but rather by business logic that runs on top, adding that Symbiont smart contracts had solved the problem of netting. “We already solved that. We were the other finalist for the ASX [Australia’s main stock exchange] opportunity so we have a lot of interesting technology for that and built smart contracts solutions for a lot of problems that exist in traditional equity markets – not necessarily that you could use in the US right away, but that you can use in certain environments.

“Part of that is real time gross settlement; gross settlement versus end of day net settlement, novation, even net settlement against gross settlement in an intra-day timing mismatch. We solved that with smart contracts.

“None of that is solvable with the ledger, which is just a repository of information. The ledger doesn’t have a netting function to it; you’d have to build logic above the ledger layer. If you are going to use the ledger natively then it has to be real-time gross settlement for every transaction.”

## *US equities*

Real-time settlement is troublesome for US equity market structures because the information about the ultimate beneficial owner is not known. “In the US you have a street name. You have no idea who the ultimate beneficial owner is and due to that issue it makes it almost impossible to do real-time gross settlement on a trade by trade basis, or even on a batched trade basis,” said Smith.

“The speed with which trading happens in the US is also with HFT, ledgers are nowhere near optimised to get a hand on that kind of speed, and probably never will.”

Smith said distributed ledger technology has an inverse relationship between speed and security: the faster consensus and blocks are created, the less safe the system is. He pointed out that it took years to go from a half a second for matching down to five nanoseconds and that it’s going to take a while to optimise ledgers to get those kind of performance metrics.

“This is why I think there will be multiple ledgers that are operating because some of them will be deployed in use cases that have lower liquidity, less velocity and require more sophistication in their structure and security. Other ledgers will be purpose built to try and solve things like US equity issue.

Smith added that moving from T+3 to T+1 and real time is not a technology problem that requires a blockchain, but rather a problem of will. He said other markets provide a better opportunity, such as corporate debt or like syndicated loans, or like repo, or like private equity or a sundry of contract markets, OTC markets.

## *Proxy and corporate actions*

He said another area Symbiont is interested in is around corporate communications by proxy and corporate actions. “Now those have nothing to do with trading and nothing to do with clearing and settlement, but there are major problems around proxy. It’s an antiquated system, it’s very expensive, there are a few companies out there that act like monopolies in the proxy world and they generate a massive amount of revenue and they simply maintain very antiquated, high friction process.

“We have already built solutions for proxy where companies can take control of messaging to their shareholders. You can imagine with an immutable ledger how well voting works.

He said the idea of mailing out a thick printed proxy statement that is confusing and which may not reach

its destination – and if it does is probably heading for the trash – would be elegantly replaced by a distributed ledger and smart contract.

“If I have information, like a registry does, about who those shareholders are, or how to get information to those shareholders electronically, they can receive a proxy on distributed ledger, and when they open the proxy it sends an immediate transaction message to the ledger that proxy has been delivered. The vote is a smart contract that is created and structured in a way that it is constantly measuring the number of votes against the number of votes necessary in order to pass whatever vote that may be.

“In the event that once the vote passes there’s action items that have to be taken, like for example, a change of board members, the smart contract can immediately change those board members, send a message to a state of incorporation changing the board, updating the annual report.”

## **itBit**

This time I’m going to offer an edited version of an interview by *Business Insider* with itBit CEO and co-founder Chad Cascarilla from February 2016.

### ***Business Insider: What’s the itBit story?***

***Chad Cascarilla:*** About five and a half years ago, we came across bitcoin. What was interesting to us was the underlying blockchain technology, which is the topic du jour now but certainly wasn’t back then. The reason it was interesting to us is because we didn’t really know how successful bitcoin itself would be, but we could tell that the concept of being able to create a distributed clearing and settlement network or a distributed payment network was a pretty big deal. Not from a computer scientist perspective per se, but from a financial services perspective.

*Our view has been that we want to take blockchains and apply them to financial services problems. When we started itBit, moving things over the blockchain — ownership of real assets — was the really exciting concept. What became clear to us was you really needed some kind of regulatory structure, because if you’re moving regulated assets it’s hard to do that without a regulated entity. How can you create the on ramps and off ramps? You can do that by partnering with financial services firms — that’s helpful — but the more partners you need the slower development cycles happen. We created a trust company and about a year ago now we were approved.*

### ***BI: And your main product is Bankchain?***

*Bankchain is our product that we've built to address financial services needs. The core technology can work on anything — use case agnostic. That's not surprising, in some ways that's good engineering. [But] then you need to go out and say here's a good use case. That's what has the front end that's tailored to precious metals or syndicated loans or equities settlement. It's complex to build the front end and the data layer hooking into the core databasing technology. Then you have to hook it into the current system of the people you're working with.*

**BI: Is there any particular use cause that's more popular than others?**

**CC:** *Post-trade is pretty huge. Oliver Wyman said it's like an \$80-85 billion market. That's about a third of capital market revenues. So of all capital markets, about a third is sitting in post-trade — it's enormous. It's hard to say people want to address just one specific area because they've got to address this whole thing. But you've got to drill down — if you want to try and fix syndicated loans with blockchain, you could be doing that for years. If I think of the use cases that I know firms are working on, it's everything from cross-border payments to OTC derivatives to syndicated loans to equities to repo to precious metals to trade finance. Those are just some of them.*

**BI: Does this technology need a critical mass to go mainstream?**

**CC:** *No one wants to show up at the club and nobody else is there. There's two ways you combat that. The first is you create a system that's fully interoperable with today's world. Because we're a trust company we have our own SWIFT code, we have access to all the infrastructure, we have a whole variety of ways to interact with the world as it is now. We have a way to move people incrementally to tomorrow — you can't just get to a future state. You have to make it so that if you're on [the Bankchain] you can interact with everyone who's off and you have to make it relatively easy to do.*

*Secondly, you have to make sure that you go out and make sure that people are invested in this product, meaning they're helping you build it, you're getting ideas from them, it's solving their needs. You can't just create something that you think someone wants.*

**BI: How are you guys funded?**


**CC:** *We've raised \$32.5 million (£22.3 million) so far and it's basically come from a combination of VCs and the management team. We're going to obviously expand our funding base.*


**BI: How long do you see industry adoption of blockchain taking?**

***CC:** Again it gets down to use cases but lets just say people start doing proof of concepts and maybe even start having it rolled out in certain markets this year. I think you could see limited roll-out, we certainly hope to be rolling out in the precious metals market this year. But I think realistically, this is a big upgrade cycle. It's going to take a decade or more.*

Ooooo. That's what I said.

111  
Shares

74

26

