Is blockchain looking for a problem to solve?

According to a recent report from the Deloitte University Press “blockchain is coming to disrupt your industry”. And none seems more vulnerable than financial services.
To answer the question around obtaining true value from blockchain, we must first ensure a clear understanding of what blockchain is. In simple terms, blockchain is a digital, distributed ledger of transactions that you might think of as a spreadsheet. Yet it comprises a constantly growing list of transactions called “blocks” – all of which are sequentially connected. Each block has a link to the previous one in the list. Once a block is in the chain it can’t be removed, so it becomes part of a permanent database containing all the transactions that have occurred since its inception.

One interesting element to consider with blockchain is that there is no central authority or single version of the database. Which means it exists on every system that is associated with it. Every system has its own complete copy of the blockchain. As new blocks are added, they’re also received by every system – for the ultimate distributed database. So if you lose your copy, no problem. By rejoining the blockchain network you get a fresh new copy of the entire blockchain.

Some might wonder why we can’t do this with JMS (Java messaging service). Remember that JMS has an API (application programming interface) but no protocol. When your JMS client has to talk to a JMS server that is located on another machine on the network (a typical case), the protocol used between the client and the server will be based, in one way or another, on TCP/IP. Over the wire, you’ll be able to see TCP/IP packets being exchanged back and forth. So one vendor cannot send a message to another vendor using JMS. AMQP was invented to address this issue, but this hasn’t been fully utilised.

Banks like JPMC were ‘ahead of the game’ by realising the opportunity for something that would support message transfer enabled through bank collaboration. Now blockchain can do this and so much more.
Historically, blockchain has been seen as the main technical innovation of bitcoin, where it serves as the public ledger of all bitcoin transactions. Bitcoin is peer-to-peer; every user is allowed to connect to the network, send new transactions to it, verify transactions, and create new blocks, which is why this approach is called permissionless. This original design has been the inspiration for other cryptocurrencies and distributed databases. Up until now, settlement has been through novation, meaning that I change ownership twice, i.e. the transaction goes to the central bank before it reaches the beneficiary. So blockchain replaces novation with a single transaction based on mutual trust. Novation was a solution to the problem of mutual trust at technical scale; we now have the technology to do this without a novation solution, this changes the concept of ownership and as a result how transactions are processed.

But blockchain doesn’t have to be permissionless. A permissioned blockchain, works in much the same way as permissionless but its’ network appoints a group of participants (in the network) who are given the express authority to provide the validation of blocks of transactions. Or, to participate in the consensus mechanism. In addition, with a permissioned blockchain, the participants in the network have an ability to restrict who can create smart contracts and/or transact on the blockchain network, allowing for transparent governance within the consortium only. We will look at smart contracts in more detail in the next section. As a result, permissioned blockchain networks can be used iteratively to accomplish very specific business problems. They can also be optimized to achieve those solutions rather than having to be built for only the lowest common denominator.

More than just for monetary transactions

What are smart contracts?

Smart contracts enable people to trade and do business with strangers, usually over the internet, without the need for a large centralized authority site to act as a middleman.

They are written as programming code which can be run on a computer rather than in legal language within a printed document. This code can define strict rules and consequences in the same way that a traditional legal document would, stating the obligations, benefits and penalties which may be due to either party in various different circumstances. But unlike a traditional contract it can also take information as an input, process that information through the rules set out in the contract, and take any actions required of it as a result. This is important because the main problem with conducting business with strangers over the internet is the issue of trust. Most business requires some element of trust.
So how could blockchain be used?

There are many blockchain solutions and many uses for this new technology. Is bitcoin blockchain the solution? It depends what you want to do with it. Ripple for example is best used for payments but not ideally suited to Trade Finance. This is because it can’t do smart contracts but is excellent for RTS (real-time settlement). However other solutions may be more suited to Trade Finance and we know that blockchain has to hold the key to addressing the high costs of supporting Trade Finance. A leading bank recently claimed that it makes 72% of its revenue from Trade Finance but its cost to run this side of the business amounts to around US$5billion per annum, most of which is related to ‘moving bits of paper around’. Utilising blockchain means that this cost could be considerably reduced.

Blockchain for Trade Finance

Permissioned blockchain is a very good solution to ease international trade, because of a complex ecosystem of importers, exporters, banks, shipping agencies, government agencies and other organizations. It’s hard to find one centralized entity as a point for convergence for everyone to work with. Blockchain-based supply-chain startup Wave, focuses on supporting this element of the market. At present, the exporter submits the invoice, bill of lading, quality certificate, certificate of origin and other documents that go along the supply chain to a bank. The bank checks and forwards the documents to the importer’s bank and then, they finally reach the importer. The importer then has the task of handing over the bill of lading to the shipping agency for release of goods. However, all these processes are based on antiquated tools in the supply chain; the process is slow, and, as with any paper-based process, it is open to fraud risks. According to Wave, they incorporate industry standard workflows, replacing printed documents with versions that are stored electronically in blockchain transaction metadata. The document will go between the parties on the supply chain [over the blockchain], but if they want to change ownership, the document will be sent to the recipient, and the sender will publish a transaction that moves the document4.

And blockchain technology can also support factoring. Factoring involves a bank paying the seller of goods before the buyer of those goods makes the payment. Naturally, banks charge (typically 4% but can be as high as 8%) the supplier for this service, but assume the risk that the buyer delays payment or even defaults. Despite that protection, factoring is a costly undertaking for suppliers, eating significantly into margins and introducing an element of insecurity to the payment picture. For all parties, factoring involves multiple risk factors including nonpayment, duplicate payment, misrepresentation and even fraud. And setting risk aside, processing costs related to manual due diligence, document collection and coordination of remittances are high. However, blockchain approaches are also being proposed to boost efficiency in this area. With blockchain, banks can be sure of the risk associated with duplicate and fraudulent invoices mitigated by the tokenization of each invoice. It can create a digital asset that can be transferred between markets, partially financed by multiple parties and grouped together to create new assets. Payments could be programmatically tied to each invoice so buyers do not have to collect additional remittance information.

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4 Coindesk, Wave Brings Blockchain Trade Finance Trial to Barclays, Oct 2015
Blockchain for RTS
And the opportunity doesn’t stop there. Banks form agreements all the time - correspondent banking; anywhere that a bank has a relationship with another bank, there must be a blockchain use case. A good example can be found within South East Asia where some small banks, which have operations in multiple entities, are already embracing what blockchain can offer. They are undertaking cross border real-time settlement (RTS) using Ripple infrastructure. The rationale is that the cost of running RTS was so much lower than using SWIFT with its associated costs. Because they are actively using blockchain already, they are ahead of understanding alternative ledgers, so when the inflection point does hit, they are ready. By adopting this approach they can have real calculations on how the system benefits them rather than waiting for the ultimate reports from peer to peer distributed ledger consortiums like R3 to come out, then they can be ahead of the game by being able to build a real product accordingly.

However, applying this use case in Europe would be difficult, since the Single Euro Payments Area (SEPA) already provides a low cost and fast mechanism for cross-border payments. But it remains valid for banks with an international footprint outside of Europe or extending beyond Europe.

Blockchain for internal efficiency
But when we look at the example of a leading banking spending around US$5 billion per annum to run their trade business, an obvious opportunity has to be from an internal perspective. Distributed ledger technology could help increase efficiency in banks’ internal pre and post-trade work flows.

Blockchain allows asset ownership to be verified by a network of computers on the Internet rather than via a centralized authority. And unlike with external opportunities for trade finance, there is no reliance on collaboration with other financial institutions; the technology could be used now. In fact blockchain technologies could reduce banks’ infrastructural costs by $15-20bn a year by 2022, Santander InnoVentures

Security; digital transaction protection
So how can this possibly result in a secure method for conducting digital transactions? The short answer is through some very complex cryptography, math puzzles, and crowdsourcing consensus. The net result is called a “trustless system”. This doesn’t mean that the system can’t be trusted. It simply means that two parties don’t need a trusted third party (such as a bank or credit card company) to maintain aledger and valid transactions. Because every transaction can always be verified against the distributed ledger, a copy of which resides with all parties.

claims. The promise of increased efficiency and reduced costs has led to a wave of project launches by large institutions. CME Group is working on projects around the use of blockchain in areas such as clearing, while BNP Paribas is exploring its use in custody, and UBS is also experimenting with it in its new lab in London.

In addition, blockchain provides benefit for reconciliation. Distributed ledger makes reconciliation of complex data easier since the ledger is common. This can be a benefit in interbank settlement as well as for internal reconciliation processes.

Making blockchain work through collaboration
One major issue is getting blockchain to a stage where it can be usefully applied. Banks need to collaborate to make blockchain work as there is no central authority (such as a central bank) bridging that gap. Last year, the financial innovation firm R3 established a consortium partnership with the world’s leading banks to provide distributed ledger technologies to economies worldwide. Using Microsoft Azure BaaS with multiple Blockchain partners such as smart contract platforms Ethereum, Eris, and Tendermint, R3 created a peer-to-peer distributed ledger that connects many of the consortium’s leading banks. In a first test of the distributed ledger, the banks simultaneously simulated financial transactions.
Act now or wait and see?

As we have already heard, blockchain can be thought of as a distributed ledger or database open to anyone, eliminating the need for central authorities to certify ownership and clear transactions. Businesses that deal with slow, costly, or unreliable transactions, or that serve markets with underdeveloped payments systems or a lot of unbanked customers, have good reason to consider distributed ledger technology. Blockchain benefits are reliability, availability, transparency, immutability and irrevocability; and therefore ideally suited to many areas of banking, including Trade Finance. And banks are starting to wake up to these opportunities; a recent report by Santander InnoVentures, a division of Banco Santander, identified 20 to 25 blockchain use cases, including securities trading.

However, one of the challenges identified with a permissioned blockchain is that it requires standards, protocols and consortia to be formed, which means that it will take time - maybe 5-10 years or even 15 years - to start to realize the benefits of blockchain. But that shouldn’t stop companies from investigating use cases and investing in the technology today – as our panel agreed: ‘if we don’t start investing and working with the technology now, it will still take 15 years once we do start!’. However, many banks, including some within the discussion group highlighted that they felt that there was ‘no hurry’. But, can banks really afford to wait?

Many banks now consider the biggest competitor to banks as not start-ups but telecommunications companies who are looking to obtain banking licenses. With millions of active users with an affinity with their product, companies such as Reliance Industries Ltd (RIL) in India which was recently granted a payments bank license, could be a serious threat. The move gives RIL the opportunity to ‘leverage its telecom business Reliance Jio’s pan-India network and retail arm’s model, even as its tie-up with State Bank of India, India’s largest bank with over 20000 branches (SBI) will help create the most extensive distribution network in India’. Other areas of the telcos industry is clearly also showing interest in blockchain and investing in it.

A recent report ‘Blockchain and Its Impact on the Telecom Industry’ highlights the opportunities and interest the industry is already showing in this new technology. In particular, it claims that ‘It is a potential platform for innovation in the development of complementary services. It could add new mobile payment capabilities for service provider financial service projects (with particular interest in areas with large numbers of unbanked people) to enable autonomous transactions within IoT, (Internet of Things), platforms being built by network operators and vendors, and to help solve issues of identity and fraud management.’ So it is essential that banks start to work with this technology now or they run the risk that their competitors from the telcos space may benefit from blockchain well before banks are able to; giving telcos a ‘first mover advantage’.

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1 The FinTech 2.0 Paper, Santander InnoVentures report produced in collaboration with Oliver Wyman and Anthemis Group
2 Zeenewsindia, Aug 2015, Payments bank licence to leverage telecom, retail biz: RIL
3 2016 report by Heavy Reading
Blockchain is a foundational technology, like TCP/IP, which enables the Internet. And much like the Internet in the late 1990s, we don’t know exactly how the Blockchain will evolve, but evolve it will. Similar to the Internet, blockchain must also be allowed to grow unencumbered. This will require careful handling that recognizes the difference between the platform and the applications that run on it. TCP/IP empowers numerous financial applications that are regulated, but TCP/IP is not regulated as a financial instrument. While the predominant use case for blockchain today is bitcoin currency exchange that may require regulation, this will change over time. Had we over-regulated the Internet early on, we would have missed out on many innovations that we can’t imagine living without today. The same could be true for blockchain.

We have already heard of several potential use cases for blockchain and in the coming year we are likely to see many more encompassing its use in finance. Examples will include payment and settlement of fiat currencies, asset registries without the need for a central authority, the facilitation of regulatory reporting and the issuance, transfer and clearing of securities though more efficient post-trade processing. In addition, know-your-customer and anti-money laundering registries and surveillance, and securities asset servicing may also improve by utilizing blockchain technology. Realizing the benefit will take many years in most cases, not just because the technology must mature, but also because there is a reliance on collaboration within the finance industry and beyond. However, as one of our panels described it, ‘getting banks to agree is like pulling teeth’. Technologies require standardization to become prevalent. We need to be talking to each other to reach the ‘internet’ stage where we can actually make full use of the what blockchain can offer. Governments must understand the stage the market is at. They must support banks who build the blocks to enable blockchain transactions to allow a greater understanding generally, and inevitably, learn the full value. However, while this may take many years, the opportunity for banks to use blockchain internally to increase their own operational efficiencies, particularly to remove paper based processes, is huge, and can be realized at a faster pace. This is where the current short term business case lies for banks at the moment. But let’s not forget the long term; it’s likely that those financial institutions that drive innovations in blockchain will outpace those who wait, can you afford to be left behind?