FinTech Network

Four Blockchain Use Cases for Banks

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FOUR BLOCKCHAIN USE CASES FOR BANKS

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Introduction

A blockchain is a data structure that makes it possible to create a digital ledger of transactions and share it amongst a distributed network of computers. It uses cryptography to allow each participant on the network to manipulate the ledger in a secure way without the need for a central authority.

Once a block of data is recorded on the blockchain ledger, it's extremely difficult to change or remove. When someone wants to add to it, participants in the network (called miners) — all of which have copies of the existing blockchain — run algorithms to evaluate and verify the proposed transaction.

Blockchain technology is emerging as the way to let companies make and verify financial transactions on a network instantaneously without a central authority. Traditionally, banking and payment transactions have relied on a central authority or middleman for making or enabling payments. The blockchain architecture allows a distributed network of computers to reach consensus without the need for this middleman.

In banking there are many existing and developing use cases to implement blockchain.

> "Blockchain has so much potential… there are thousands of blockchain use cases… [banks should] focus on one or two uses cases and be good in that and then that might eventually be adopted but don't focus on all use cases together because you can't then accelerate on one."
>
> Chris Huls, Rabobank

This White Paper will therefore set out only four potential use cases for banks, concentrating on the last use case of payments, in considering the possibility of utilising blockchain technology in banking.

FOUR BLOCKCHAIN USE CASES FOR BANKS

Use Case 1 – Reduction of Fraud

Chris Mager of BNY Mellon Treasury Services acknowledged that "one of the main challenges facing the banking industry today is the growth of fraud and cyber-attacks."

Traditionally, bank ledgers have been created within a centralised database. This model has been more susceptible to hackers and cyber-attacks as all the information is located in one place – usually secured behind outdated legacy IT systems. Hackers and cyber-criminals are well aware of evolving digital technology and have been able to bypass these security systems to commit data breaches and fraud.

In contrast, as the blockchain is decentralised it is less prone to this type of fraud. By using blockchain there would not only be real-time execution of payments but also complete transparency which would enable real-time fraud analysis and prevention.

How?

Chris Huls of Rabobank defined blockchain as "a ledger or database that can store all types of information or value exchange that is publicly available for all participants in a group where they all see exactly the same data." Therefore, as blockchain is checked at every step of a transaction by independent miners, with all data being open and publicly available, there is a real-time analysis and verification of every bit of data and all information during the transaction. The blockchain ledger can provide a historical record of all documents shared and compliance activities undertaken for each banking customer. Malicious attempts to view or change the data become part of the data itself, making third-party hacks immediately obvious.

For example, this record could be used to provide evidence that a bank has acted in accordance with the requirements placed upon it – should regulators ask for such clarification. It would also be of particular use in identifying entities attempting to create fraudulent histories. Subject to the provisions of data protection regulation, the data within it could even be analysed by the banks to spot irregularities or foul play – directly targeting criminal activity.

This would be an advantage over the current banking and payments systems, which are more susceptible to fraud and hacking. Chris Huls stated, though, that there would need to be collaboration to achieve this in blockchain. Banks would need to partner with regulators and FinTechs to "develop credible, decentralised ledgers permitting rapid adoption of global real-time payments and settlement."

On 30 December 2015 Nasdaq announced that it had made its first ever share trade using blockchain technology. Nasdaq used its proprietary Linq platform (developed in collaboration with Chain.com and global design firm IDEO) to sell shares.

As Nasdaq has pointed out, within the multi-step manual process used today in banks and financial institutions there is not only plenty of room for error but also for fraud. By utilising blockchain, organisations can reduce risk and administrative burden, as well as saving time and money.

Nevertheless, banks must consider that blockchain doesn't yet eliminate all types of fraud.

In August 2016, nearly 120,000 units of digital currency Bitcoin worth about US $72 million was stolen from the exchange platform Bitfinex in Hong Kong. The Bitcoin was stolen from users' segregated wallets and amounted to about 0.75% of all Bitcoin in circulation at that time. Since the hack, Bitfinex has taken steps to reimburse accountholders with "BFX tokens" which are cryptographic tokens on the Omni blockchain that can be exchanged for $1 beneficial interests in iFinex (Bitfinex's parent company).

Use Case 2 – KYC

Know Your Customer ("KYC") requests currently can cause delay to banking transactions, typically taking 30 to 50 days to complete to a satisfactory level. Current KYC processes also entail substantial duplication of effort between banks (and other third party institutions). While annual compliance costs are high, there are also large penalties for failing to follow KYC guidelines properly.

The average bank spends £40 million a year on KYC Compliance, according to a recent Thomson Reuters Survey, which also revealed that some banks spend up to £300 million annually on KYC compliance, Anti Money Laundering ("AML") checks and Customer Due Diligence ("CDD").

Since 2009, regulatory fines, particularly in the USA, have followed an upward trend with record-breaking fines levied during 2015. On-going regulatory change, with no one internationally agreed standard, makes it increasingly hard for banks to remain compliant. Thus, as it can take such a long time to on-board a new customer because of lengthening KYC procedures, this is having an increasingly negative effect on customer experience.

Chris Huls of Rabobank proposed the use case that "KYC statements can be stored on the blockchain." Once a bank has KYC'd a new customer they can then put that statement, including a summary of the KYC documents, on a blockchain which can then be used by other banks and other accredited organisations (such as insurers, car rental firms, loan providers etc.) without the need to ask the customer to start the KYC process all over again.

These organisations will know that the customer's ID documents have been independently checked and verified so they will not need to carry out their own KYC checks, reducing their administrative burdens and costs. As data stored on a blockchain is irreversible, it would provide a single source of truth thereby minimising the risk of duplication or error.

There is also the advantage for the customer that they only have to supply KYC documents once (until they need to be updated) and that they are not then disclosed to any other party (except for their own bank) as the other organisations will not need to see and check the ID documents but will just rely on the blockchain verification.

SWIFT has established a KYC Registry with 1,125 member banks sharing KYC documentation – however, this is only 16% of the 7,000 banks on their network. The KYC Registry meets the need for an efficient, shared platform for managing and exchanging standardised KYC data and it's free to upload the documentation to the Registry and to share it with other institutions. SWIFT validates the data rigorously, informs the client if it's incomplete or needs updating, and sends out alerts to correspondents whenever the data changes.

There will still be issues surrounding security and privacy of customer's KYC information but, as long as all KYC is held on a private blockchain rather than a public one, these issues should be minimal from a bank customer's point of view. The data on the blockchain will merely be a reference point with a digital signature or cryptographic hash – which would give individuals access to the relevant client information in a repository separate to the blockchain, ensuring a secure and private way of conducting and storing a customer's KYC information. Equally important, though, is ensuring financial institutions only have permissioned access on a temporary basis so that access to KYC information is only granted when strictly necessary for that purpose, and for no other ancillary reason.

Therefore, it is evident that Blockchain could have a major role in streamlining these KYC and AML processes – although this may require cross-border consensus as to what is regarded acceptable KYC documentation and what needs to be done in terms of acceptable verification of those documents.

According to a Goldman Sachs Report, Case Study 7, the banking sector can achieve 10% headcount reduction with the introduction of blockchain in the KYC procedures. This amounts to around $160 million in cost-saving annually.

Blockchain will also reduce the amount of budgetary resources allocated for employee training, there will be 30% headcount reduction amounting to $420 million.

Overall operational cost savings are estimated to be around $2.5 billion dollars. AML penalties will also be reduced by estimated amount between $0.5 to $2 billion dollars.

Use Case 3 – Trading Platforms

A bank could set up a new trading platform (or move across an existing trading platform) on a blockchain protocol. The blockchain technology offers a potential new medium to exchange assets without centralised trusts or intermediaries – and without the risk of double spending.

As already discussed, blockchain can eliminate the threat or the risk of fraud in all areas of banking, and this could equally apply to a trading platform. Furthermore, blockchain would also address issues such as operational risk and administrative costs as it can be made transparent and immutable.

The traceability and the permanent historic record that would exist on blockchain backing up every asset or item of value that was traded would provide assurance and authenticity all the way through the supply chain.

In practice, when a high-value item is first created, a corresponding digital token is issued by a trusted central authority which acts to authenticate the product's point of origin. Then, every time the product is bought and sold the digital token is moved in parallel so that a real-world chain of ownership is created and mirrored by the blockchain history of that digital token.

The digital token is acting as a virtual "certificate of authenticity" which would have the advantage that it is far harder to steal or forge than a piece of paper. Upon receiving the digital token, the final recipient of the product will then be able to verify the chain of custody all the way back to the point of creation.

The blockchain gives the benefit of distributed and verifiable trust that was not present before.

As a non-banking example, Everledger, a permanent ledger for diamond certification, has adopted the use of Bitcoin as a mark of authenticity providing transparency for all parties involved – a clear attempt to prevent diamond fraud.

Similarly, the immutability and digital uniqueness inherent in blockchain offers the ability to provide a secure transfer of value and delivery of a solution to the trade finance problem of endorsement.

The challenge of maintaining data privacy among counterparties to trade transactions is also overcome by utilising blockchain technology where tokenisation, in the form of cryptography, is used to protect the trade data with parties only allowed to access to permissioned information with the correct security key. This should enable the most confidential of transactions, especially financial transactions, to still take place on such a trading platform.

Clearing and settlement costs billions and, according to Santander's 2015 report LINK, it is estimated that moving this into a digital record, near real-time and over the internet, will save the industry $20 billion a year or more in overhead costs due to D+3. D+3, or T+3, is the three-day clearing and settlement cycle common to most investment markets today.

Many firms are leading the charge to digitalise the clearing and settlement structures from Blythe Masters' Digital Asset Holdings with the Hyperledger to Overstock with T0, along with many other key and emerging players such as Epiphyte, Clearmatics and SETL.

Use Case 4 – Payments

The main use case that is focused on when looking at the possibilities of blockchain for banking is that of payments. Chris Huls of Rabobank said that blockchain could be used as "another way of paying each other, not depending on SWIFT and other payment schemes."

Chris Mager of BNY Mellon also recognises that there is a potential role for blockchain in payments and that currently there is an "unprecedented period of change and transformation." Mager recognised that blockchain could have benefits for not only bank customers, but this could also lead to operational efficiencies and cost savings for banks themselves. He also stated that payment systems collectively are currently under a lot of pressure, as there has been urgency to modernise payments and to address the questions of safety and security since the 2008 financial crash. This has led to new market entrants, such as FinTechs, looking to solve these problems using blockchain.

The existing payment system has always gone through banks and central banks, a process that was first put into place in the 1970s and 1980s. Apart from speeding up money transfers, blockchain could also help banks to operate continuously, 24 hours a day. This is now somewhat expected by customers who want an omni-channel banking experience at any time day or night – especially, according to Chris Mager, for "millennials who are now firmly within the workforce and want a better, quicker and easier way to make payments."

Rabobank has been heavily involved in the on-going development and use of Ripple Lab's blockchain Ripple protocol. It was announced in December 2014 that the three banks had started to test blockchain technology in making payments to customers and cross-border transactions. Ripple has said that its technology could give banks a 33% reduction in their operating costs during the international payment process and allow lenders to move money "in seconds."

Ripple is a "real-time gross settlement system" (RTGS), currency exchange and remittance network. Released in 2012, Ripple purports to enable "secure, instant and nearly free global financial transactions of any size with no chargebacks." It supports tokens representing fiat currency, cryptocurrency, commodity or any other unit of value.

Ripple can be used by banks for an open-source approach to payments to replace many of the common intermediaries in the payments industry, thereby passing on savings to partner institutions, and thus by extension, to their customers.

Thus blockchain can be used to make payments in real-time globally, with real-time execution, complete transparency, real-time fraud analysis and prevention and also at a reasonable cost. The only issue with Ripple, at the moment, is that it is a proprietary blockchain network that cannot yet connect with other systems. In order to connect Ripple to other blockchain protocols an inter-ledger protocol will have to be developed, tested and put in place.

There are, however, other blockchain protocols in limited use and in development for the payments industry.

In Estonia, LHV Bank is experimenting with blockchain through coloured coins called "Cuber" as a "cryptographically protected" certificate of deposit. The project would enable the bank's FinTech offshoot, Cuber Technology, to develop mobile apps using blockchain to provide free P2P fiat currency transfers.

Rain Lõhmus, Chairman of the Supervisory Board of LHV Bank, said that all Estonian government and finance infrastructure relies on public-key cryptography, which makes exploring blockchain to be a natural next step.

As Chris Mager from BNY Mellon also highlighted, VISA Europe Collab and BTL Group are working on a separate concept to make cross-border payments between banks using distributed ledgers. The project will use BTL's cross-border settlement platform Interbit to explore the ways in which a distributed ledger-based settlements system (as well as utilising "smart contracts") can reduce the friction of domestic and cross-border transfers between banks. This is a similar goal to Ripple but, as it is based on the Ethereum smart contracts concept, it is not proprietary like Ripple and thus is potentially more scalable.

Chris went on to explain that, similarly, UBS, Deutsche Bank, Santander and BNY Mellon have teamed up with blockchain developer Clearmatics and trading company ICAP to create a new digital representation of fiat currency called the "Utility Settlement Coin." Although this is still a proof of concept, it could potentially reduce friction in delivery versus payment scenarios by providing a faster and less expensive settlement mechanism than existing funds transfer and currency exchange mechanisms.

Challenges

At the moment it is proposed that blockchain can resolve a number of issues and problems currently facing the banking and payments industry. However, there are still a number of challenges facing banks and FinTechs before blockchain can be fully implemented as a viable alternative that can garner trust from the public.

The main issue is one of privacy. With an open ledger system it becomes inherently difficult to ensure privacy of customer data. Although this can be mitigated in some way by the use of a private or permissioned blockchains with strong encryption, there will still be some cybersecurity concerns that need to be addressed before the general public will entrust their personal data to a blockchain solution.

As seen with the Ripple protocol there is also a question over how blockchain solutions can integrate not only with existing banking and payment systems but also with each other (especially if they are a proprietary system). In order to make the switch there needs to be collaboration and consensus between a number of different parties and stakeholders which will take time.

Blockchain also faces regulatory uncertainty. There is currently no central standard or organisation that monitors and regulates blockchain protocols. Eventually there will have to be some form of central governance but, as Chris Huls pointed out, all parties will need to be careful "where the power lies". Nevertheless, it will take time to develop agreed-upon internationally accepted regulations.

There is also a question of scalability. One of the main challenges will be to resolve issues with transaction speed, the verification process and data limits that will be crucial in making blockchain widely applicable. Chris Mager of BNY Mellon thought that this could take between 7 and 10 years to develop and to get to a fully working and integrated blockchain-based payment system for commercial and/or interbank payments.

Conclusion

It is clear that there can be many different use cases for banks to utilise blockchain technology. Each well-implemented use should result in quicker transactions, less friction, greater robustness and more transparency and immutability. A blockchain solution should also reduce costs and administration burdens on banks and customers alike. It is estimated that blockchain technologies could reduce banks' infrastructural costs by $15-20 billion a year by 2022 – as claimed in the "FinTech 2.0 Paper" from Santander InnoVentures.

Not that there aren't still issues and challenges facing all the stakeholders that will be involved in the development in this area though. Challenges of privacy, of developing and agreeing upon acceptable regulations and of scalability all need to be properly addressed as does the issue of security (e.g. the Bitfinex hack). This will only be done through collaboration and co-operation. As Chris Mager from BNY Mellon put it: "there will need to be a common collective will" between banks, regulators and FinTech innovators.

It is evident, though, that this has already been happening in the last two years in terms of (i) the required technological innovation and (ii) as of Q1 2016, the total venture capital investment in blockchain start-ups now exceeding $1.1 billion shows that there is financial backing and appetite to make this potentially one of the biggest revolutions to happen in banking.

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ABOUT FINTECH NETWORK

FinTech Network

We exist to facilitate and advocate the adoption of innovative and disruptive financial technologies. We do this by uniting the most influential figures in the industry to challenge the status quo and improve traditional banking systems. This happens through our industry leading conferences and original content.

W: www.fintecnet.com

dmurphy@fintecnet.com

UK Telephone: +44 (0)203 468 9461

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