How blockchain is disrupting the financial sector.

Blockchain is one of the hot topics nowadays. Most people heard already about blockchain, yet few people know what really can be expected from it. This technology will have a big impact on the public sector, digital applications, internet of things, etc. Even though the whole blockchain idea is still in uncharted waters, it is clearly disrupting the financial sector.

Bitcoin: the tip of the iceberg
Blockchain was first applied as the underlying technology for the cryptocurrency “Bitcoin”. This digital currency proved it is possible to transact cash without an intermediary. It provided a decentralized ledger with anonymous consensus, made possible by virtual mining systems (O'Donnell, 2016). By assisting the mining mechanism it was possible to earn money. The mechanism burns energy to stay in balance and was financially very interesting in the beginning (Gill, 2016). However, at this moment it is hard to make “free” money by mining bitcoins. Recently, it became clear that the virtual currency was only the tip of the Iceberg (Augur, 2015).

The bookkeeping principle
A blockchain, or “distributed ledger”, is a network of computers, where a collective bookkeeping is maintained. It works as a public, shared and digital ledger, which is open to everyone, but not in control of anybody. This ledger consists out of a linked list, or chain of blocks. Each block contains specific information about the amount of transactions completed in a certain timespan (Dattatreya, 2015). The transaction data can neither be lost, nor corrupted by any member. The only way to update the blockchain is by consensus. That is why it is secure, reliable and we are able to trust it 100% (EVRY, 2016).

Imagine 5 people are in a room, they talk about their possessions. After a while everybody knows the exact possessions of every person in the room. The day after they return to the room and start speaking again about their assets. Suddenly one person (Alfred) says to another (Bea) that he would
like to trade his three boats for her house. Bea agrees and the trade is done. The next day Alfred tries to sell his three boats to Camille, a third person. Camille does not agree, neither do all the other people in the room. That is because they all know that Alfred no longer owns three boats, his only possession is a house. They had an unanimously agreement about that. If Alfred wants to change his possessions he would have to convince every other person in the room and create a new consensus.

Blockchain works the same way. However there are not five, but thousands of people that have the knowledge about a certain transaction (e.g. somebody’s possessions) and that have to be convinced if you want to change it, without the involvement of any central authority. The data is kept in blocks (like the room in the example) and chained together with other blocks of data in one big network. It is called a shared single source of truth.

Blockchain: how it works; Source: (Blockgeeks, 2016)

Cut out the middle man
One of the most important benefits of the blockchain technology is that we are able to skip the intermediary holding. As all information is hold in a peer-to-peer network, the reliance on a third party is no longer necessary. Because nobody is in control, there is a risk redundancy. Even if an error occurs, the rest of the network will still work. Now, if any bank software breaks down, the clients can no longer use it. By using blockchain, this would have no influence on the bank system and all users could continue as nothing happened (O’Donnell, 2016).
Thanks to the cryptography there is always an auditable trail available. For every transaction made, there is a record of the sender and recipient. Moreover it is 100% transparent and available for public. By revealing this, the blockchain shows into which markets the money flows. On the other hand, the privacy of the users is not harmed. All money flows are anonymous; but fraud is no longer possible (Blockgeeks, 2016).

Moreover there is a lot of potential for control mechanisms and automation. We will be able to program rules into money usage. This will result in lower risks and lower costs. Because everything can be exactly defined not only the regulatory will improve, but also the efficiency. All transactions will be trustworthy, thanks to the mass consensus. Blockchain will also change the way of valuing something. This medium can have everything as a value: money (different currencies), bonds, shares, oil, property, ... or even votes.

We can conclude that blockchain is more secure and transparent, while the privacy is not harmed and the risk lowers significantly. We are speaking of a disruptive innovation which will change many business models as they exist today. Don & Alex Tapscott call it the biggest thing on the internet since the world wide web itself (Tapscott, How Will Blockchain Change Banking? How Won’t It?, 2016).

**Cyber criminals and current limitations**

The blockchain technology is quite recent, which means it has some limitations and is still being developed and improved. Access and ownership are two of its challenges (Resham, 2015). The blockchain technology raises some questions such as if the access to it should be either controlled or open? How can we be certain about the ownership when a non cryptographic is being transferred into the ledger?

At the moment the capacity and processing speed is low compared with other payment methods. While VISA can handle 56,000 transactions per second (tps) and Paypal 115 tps, Blockchain is restricted to 7 tps and a max of 1mb per block (Gilbert, 2016). However, the technology is improving and Blockchain is figuring out how to tackle this problem.

Probably the biggest threat is the security against criminals. Recent cyber attacks against cryptocurrencies make the financial industry question the safety of these digital currencies. Cryptocurrency companies, such as Coinbase (Bitcoin) DAO (Ether) and Bitfinex, rely on new programming language. This makes it very hard to speculate where there is a potential risk for flaws. In June DAO lost over $50M (of its total capital of $150M) by being hacked and cyber criminals stole around $65M of Bitfinex in August (Kuchler, 2016).

Also the storage of cryptocurrencies might be a problem. When the value is stored in a “hot wallet” in an online warehouse it is an interesting target for cyber criminals. That is why Bitfinex moved all of its resources into so called disconnected “cold storage”. Also Coinbase holds 98% of all bitcoins in offline storage (Kuchler, 2016).
What’s in it for the financial sector?

Nowadays when a client makes a payment via transfer, it involves the bank, a trader and clearing houses. This results in 2 days of work. When we introduce Blockchain in this process, it will only take some minutes of work. The potential of reducing costs in the financial sector is enormous.

A couple of years ago the blockchain technology was foreshadowed to be the end of the banks and financial institutions. Ironically, almost the whole financial industry now sees the potential of the technology behind the cryptocurrency. It will have a much bigger impact than payments only. It will simplify banking, increase the quality of offered products & services and radically speed up bank processes.

As for most of the new technologies, regulation is running behind of innovation. It is very clear that blockchain will have a huge impact on the way of working in the financial sector and consequently on its regulations. There is no doubt that it will have a huge regulatory impact, with registration on the blockchain network as one of the main issues.

That is why at the end of the year 2015, 9 major banks decided to start a consortium (Gill, 2016). By August 2016 the blockchain technology R3CEV consortium already consisted out of 47 financial companies. In June the World Bank organised a 3-day event involving 90 central banks of all over the world with the goal of searching answers regarding blockchain, its regulations, its threats and its opportunities. The blockchain research and investigation in the financial industry is aggregating continuously. Some of the major opportunities are already cleared out, but there is still a lot work to do.

Drop the rating agencies

Thanks to blockchain technology we no longer need to rely on analytical companies, rating agencies and other banks in order to create trust or get a verification. Blockchain will substantially decrease or even eliminate a third party to gain trust. Due to the blockchain something’s or somebody’s credibility can be checked at every moment.

Know your customer

SWIFT recently started with the creation of a KYC registry. With over 2000 participating financial institutions, the advantages of a shared KYC registry become clear (SWIFT, 2016). All over the world banks and financial institutions need to ensure compliance and check some local regulated
requirements. A worldwide database makes this job a lot easier and reduces a lot of unnecessary research and paperwork (Holley, 2014).

Using the blockchain technology for this database would not only reduce double work, it would also result in a lot of new opportunities such as automation of account opening (Shelkovnikov, Blockchain applications in banking, 2016). Thanks to the shared registration also any criminal abuse would be excluded. Moreover it would significantly reduce costs. KYC is without doubt one of the most interesting financial applications of blockchain.

**Fast payments & instantaneous settlements**

At the moment global payments are still a very costly and time-consuming business for banks. There are many possible errors and the transparency and traceability is not always how it should be. All of these problems will disappear by using blockchain. Santander was one of the first banks experimenting with the blockchain technology in their newest payment app. Clients of Santander can now make international payments 24/7 (Vernon, 2016).

Settlement between different banks and countries for one single payment can now have a duration of 3 days. By using blockchain this is transferred in some seconds. As mentioned before, also the value doesn’t matter. If the trade is done in different currencies, stocks, titles or bonds, the settlement will always be done almost immediately without any manual intervention (Vernon, 2016). All of this results in significant lower risks, lower costs and higher customer satisfaction.

**Smart contracts in insurance**

Also the insurance sector may benefit from the blockchain technology. By implementing smart contracts using a blockchain fraud would be almost impossible. Claims would be very transparent, which means that more than 1 claim for one single situation would be detected immediately (Vernon, 2016). If these smart contracts are inserted in the blockchain, the insurance can be valuable from the exact moment the fee is paid. Also the network would provide a clear historical overview and reputational system per client (Shelkovnikov, Blockchain applications in insurance, 2016). By this transparent method the client’s social and economic assets will be mapped. The insurer will have a very clear view on the actual calculated risk. Moreover the customer experience would improve thanks to higher efficiency and a more streamlined approach.

**Audit & security**

A transparent network where all transactions can be seen in one single moment, seems like a dream for an auditor. By using blockchains this is becoming reality. Moreover the use of automations and the implementation of controls will be a lot easier. Fraud will be almost impossible in this real time distributed ledger.

Although the cyber criminality is a real threat for the cryptocurrency companies, the security for banks improves significantly (Barnes, 2016). Today banks are frightened about cyber-attacks or phishing. The blockchain technology increases the security as a result of trust generated by mass consensus.

**All that glitters is not gold**

Interesting times are ahead of us, that is for sure. Unfortunately it is not only positive news for the banking sector. First of all there is still a lot of research that needs to be done. Almost everything still needs to be regulated, developed and implemented. Don’t expect all of these advantages by next year. The world of blockchain as it is today is called “the Wild West” (Tapscott, How blockchains could change the world, 2016). It will cost a lot of time and money to negotiate and research in order to get a stable base to build the banking blockchain network on.
Next to that, blockchain will be a huge threat for many jobs in the financial sector. The main benefit of the blockchain is that the middleman can be left out. Unfortunately that is exactly the function of many banks and where they make most of their profit. Many services banks are offering today are based on trust (Shin, 2016). The moment this service can be offered by a technology, which is even more trustworthy, the added value of a bank will disappear. Moreover all of the possible automations will make many functions, which exist today, unnecessary. That is why we assume that in the next 15 year, thanks to blockchain, a lot will happen in the financial sector and a lot of jobs in this sector might disappear. But there is still a lot of uncertainty about how big this impact might be and how fast we will start feeling it (Stafford, 2015).

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