

Deloitte.

Blockchain

Disrupting the Financial
Services Industry?



One of the most controversial and highly debated topics out there at the moment, is Blockchain. The world's smart and powerful people (Blythe Masters, Paul Krugman, Warren Buffet) are yet to reach a clear consensus as to whether this disruptive technology is a good or a bad evolution, but most agree it is indeed an evolution! In an attempt to try and harness its potential disruptive power, hundreds of millions are being invested in Blockchain technology by companies from all industries across the globe. With this level of focus and hype, we want to help de-mystify what Blockchain is and how organisations can leverage its key features (security, transparency, full life-cycle transaction history, real-time, immutability and cost efficiency).

In this article, based on our research, interviews, and what we are seeing in the market, we seek to explain what Blockchain and its most famous use-case, Bitcoin, actually are and understand if they are in fact real disruptors for the financial services sector as well as many other industries. To achieve this we seek to answer the following questions:

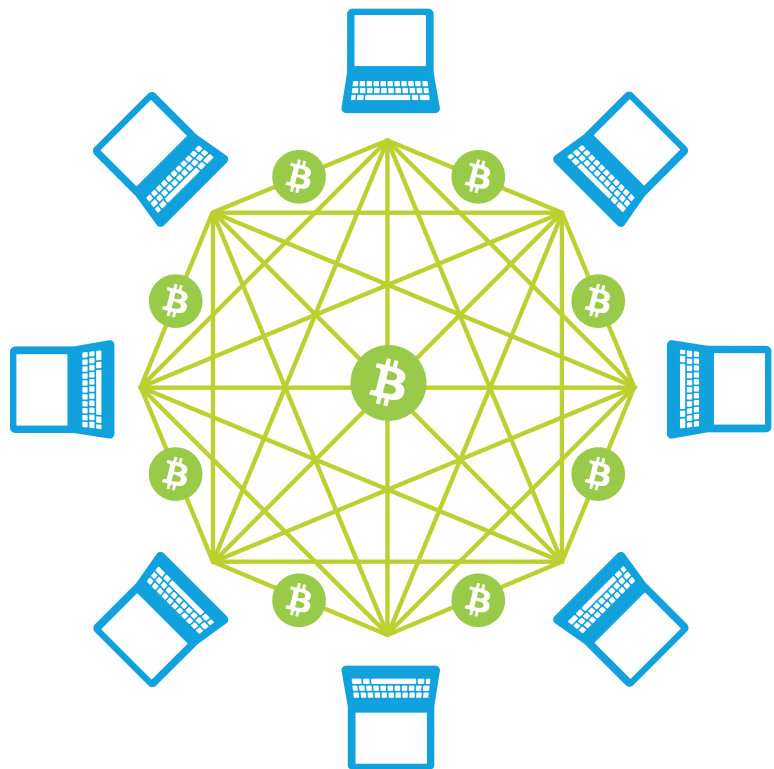
- What is Blockchain?
- What is Bitcoin?
- Why is everyone talking about it?
- What could be the impact on the Financial Services Sector?
- How to get involved?

What is Blockchain?

Blockchain is a distributed general ledger recording that a transaction happened, when it happened and that it happened correctly, without exposing any confidential details about the subject or the parties' involved. The first Blockchain transaction was created in 2009 by Satoshi Nakamoto (the pseudonym publishing the initial white paper about Bitcoin). When we talk about Blockchain we often mean the Bitcoin Blockchain, which is the general ledger of the cryptocurrency Bitcoin.

Bitcoin is the concept of an encrypted virtual currency using the Blockchain protocol to perform financial transactions. In the aftermath of the financial crises in 2008, Bitcoin was developed as an alternative to traditional currencies which were being challenged by

market volatility and liquidity needs in an environment of unpredictability and mistrust. The premise of Bitcoin is to have a peer-to-peer digital payment system enabling users to execute transactions, secured by cryptography and without the involvement of any third party (e.g. Central Bank or clearing institution) to issue or control the exchange.



Deloitte University Press

Even though you can't physically hold a bitcoin in your hand, paying by Bitcoin is not much different from using recognized currencies like cash or gold. All you need is a wallet (an address registered on the Bitcoin Blockchain accessible via an application like you have on your phone or tablet) with some bitcoins. You can then make a transaction of a certain amount to a special bitcoin address and sign it with your private key (which you need to keep secret). A verification process will take place by 'miners' ensuring that the transaction is between existing accounts on the network

and that there is no double spending. Once the block of transactions is validated and the solution has been validated by a consensus of miners, it is added in chronological order to a publically available 'distributed ledger', the Bitcoin Blockchain and cannot be reversed or changed.

How is Blockchain Different to Bitcoin?

Even though Blockchain initially was a means to create Bitcoins, today Blockchain is not only used for Bitcoins and is a software protocol on its own. The Blockchain technology is said to be changing and challenging the existing security model / paradigm. Established security models are building walls to lock people out of the network, handing out encryption keys only to people that are allowed access a certain information. Cue disruption, Blockchain's model is all about letting as many people in as possible. In fact, the more people

that have the ledger and participate in the validation, the harder it gets to break the system. "Trusting strangers with your digital information may sound silly, but it's actually a revolution in distributed computing" (IEEE Spectrum).

The distributed ledger technology of Blockchain can be used for way more than currencies:

- Virtual wallet / payments / exchange offering (Bitreserve, BitPesa)
- Process payments (BitPay, Coinbase)
- Clearing and settlement solutions (Hyperledger, Serica)
- Developing and offering cryptocurrency denominated products (SolidX, Tinker)

Different platforms are developing in order to facilitate the usage of Blockchain technology. Solutions like Factom, Counterparty, and Blockstream are building



a layer on top of the Bitcoin Blockchain and putting data into ordinary Bitcoin transactions while allowing the configuration for different applications. Whereas other platforms are built on their own Blockchain ledger, independent of the Bitcoin Blockchain:

- **Ripple:** creator and developer of the Ripple payment protocol, a decentralized and open source global payments network that allows customers to bypass major international settlement channels and transfer value instantly point to point.
- **Etherium:** a platform and programming language supporting developers to build and publish applications to codify, secure and trade

Indeed alternative public / distributed blockchains have developed, however they encounter a security risk as the concept of decentralized consensus is based on a large network. The fewer copies of the Blockchain exist, the weaker it gets.

Blockchain the Differentiators

The distributed ledger has several specific differentiators:

- Distributed
- Near Real Time
- Immutable
- Digitized

These characteristics could lead to many potential advantages:

- Reduced risk of inflation or collapse of currency as detached from country or institution
- Increased speed of settlement of transaction as no need of transaction verification by central authority
- Operational efficiency gains through pure digitalization of assets
- Reduced duplications of transaction required
- No deletion or reversibility of transactions
- Improved auditability of transactions and effectiveness of monitoring

- Reduced settlement and accounting fraud risk
- Guarantee of authenticated open data
- Near real-time reconciliation
- Reduced supervising and back office costs
- Reduced transaction costs as very limited fees
- Favouring transactions of a very small amount
- Opportunity for new forms of product issuance

The advantage of not having any link to country or institution is at the same time a challenge for countries as it is unregulated and weakening the power of monetary policies. It is challenging the role of governments as "supreme commander" and leads rather to a "role of engaged facilitator".¹

In today's economy trust is established by independent controls like audit. With a change of the security model and a ledger created by consensus, accessible by everybody, checking and recording a transaction with a timestamp, while respecting the privacy of data, the requirement for trust could change. Matthew Spoke (Senior Consultant and Blockchain Specialist at Deloitte Canada) suggests "that auditors are best positioned to shift the paradigm from one of trust to one where trust is required less and less" because of their trusted role in today's economy.²

Blockchain the New Internet?

Blockchain is all about transactions, which are defined by the Business Dictionary as "Agreement, contract, exchange, understanding, or transfer of cash or property that occurs between two or more parties and establishes a legal obligation." Based on this definition we can see that the solution has a lot of potential.

Additional virtual currencies (so called 'altcoins') have become available on the market e.g. Litecoin, Dogecoin, Liquid, Mastercoin to name just a few. It can be debated if these altcoins are competitors for bitcoin, if they are

1 World Economic Forum Report: "Deep Shift - Technology Tipping Points and Societal Impact" September 2015

2 How Blockchain Tech Will Change Auditing for Good by Matthew Spoke

only speculative investments due to their volatility and vulnerability based on their small mining pool or if they strengthen the Blockchain by allowing innovation and testing, but these crypto-currencies all try to improve one of its aspects. Litecoin for example has a higher coin limit and is generating more frequent blocks, so can support more transactions which are confirmed more quickly.

Many are currently speculating about Blockchain with identified use cases including voting, intellectual property, financial exchange, legal databases, leasing contracts, ridesharing etc. A mayoral candidate of London has included in their 2016 campaign to register the city budget on the Blockchain, aiming to make public funding, resources and assets transparent for the community.³ A recent report from the World Economic Forum has identified that by 2025, 73.1% of the 800 respondents expect for the first time tax to be collected by a government via a Blockchain and 10% of global gross domestic products (GDP) to be stored on a Blockchain.⁴ To put it into perspective, currently the total worth of bitcoin stored in the Blockchain is about 0.025% of global GDP.

³ The Cointelegraph, July 2015

⁴ World Economic Forum Report: "Deep Shift - Technology Tipping Points and Societal Impact", September 2015

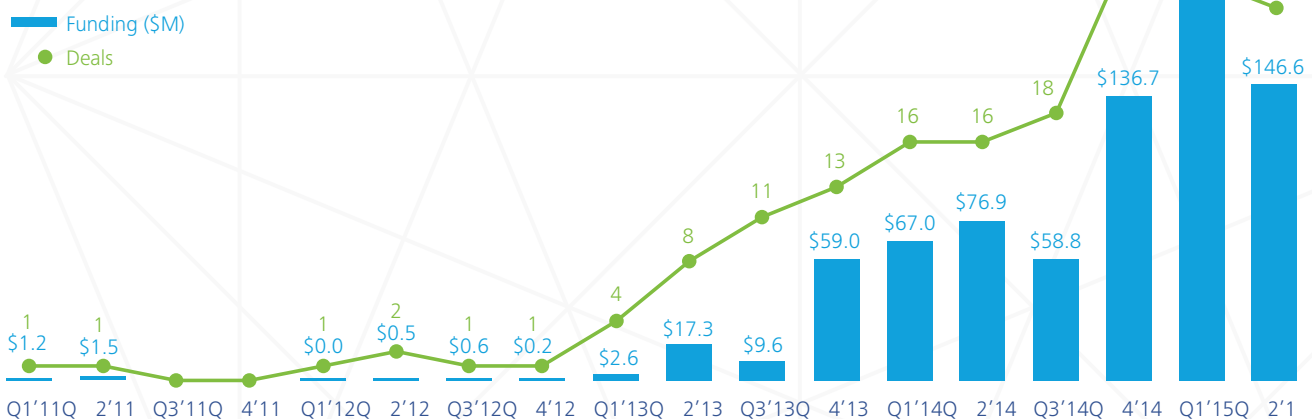
Just like the Internet. Who would have predicted in the 80s how much we would use it in our day to day lives. In its early stage the Internet technology was challenging to use, until web browsers and email applications made the Internet accessible for everybody. Likewise new applications need to be developed to transform the Blockchain technology into user friendly products and services to disrupt the status quo.

Banks Becoming the Blockbusters of the Financial World?

For now a vast swathe of Blockchain start-ups are focusing on the development of solutions for the financial services industry:

- Provide customers with access to crypto-currencies and support crypto-currency-related financial services (BTCjam, Safello)
- Track and settle both digital and mainstream financial assets in a cryptographically secure environment (Digital Asset Holdings)
- Reduce the complexity and number of intermediaries involved in existing transaction processes (Consensys, Aver Informatics)

BITCOM INVESTMENT TREND Q1'11-Q2'15



- Better manage digital risk (e.g., settlement risk, custodial risk, counterparty risk) (Switchless, Blockstream)
- Develop distributed ledger based alternatives to traditional financial services infrastructure and processes (Factom, Ethereum)
- Improve the ability to verify historical transactions (Ripple Labs, everledger)

Bitcoin start-ups raised about \$1billion USD since 2012 and the trend continues with *"Bitcoin startups funding in 2015 is already 11% higher than the total funding raised in all of last year"*⁵. Some of these companies are trying to improve current banking services whilst others are trying to enter the market themselves. Seeing this trend "Banks are afraid to become the Blockbusters of the financial world" as Paul Williams (Blockchain Technologist) put it.

Santander announced that *"distributed ledger technology could reduce banks' infrastructure costs attributable to cross-border payments, securities trading and regulatory compliance by between \$15-\$20 billion per annum by 2022"*.⁶ Indeed, the technology could reduce fees for financial transactions, transaction settlement period, risks based on currency exchange,

⁵ CBInsights July 2015

⁶ Santander report "The Fintech 2.0 Paper", 2015

cut off times or payment fault, need for duplication of documentation; it could facilitate audit trails and probably much more.

As financial institutions amongst others try to understand the new technology and its potential impact on them, they are investing into Blockchain in various ways:

- Setting up internal teams (e.g. BNY Mellon tried to integrate the Peer-to-Peer model into their client-server system and launched their own BK Coins for employees)
- Investing in start-up companies (e.g. Goldman Sachs investing US\$50 million in Circle Inc and Visa, Citi, Nasdaq, Capital One, Fiserv and French telecom Orange invest \$30 million in Chain.com),
- Launching start-up accelerators and innovation hubs (e.g. Barclays Accelerator, UBS Blockchain innovation labs in London, Singapore and Zurich),
- Creating common initiatives (e.g. Goldman Sachs, JP Morgan, Credit Suisse, Barclays, State Street, RBS, Commonwealth Bank of Australia, BBVA and UBS are sharing ideas/data and invest several million dollar in R3 to find a common standard) to understand the potential and search for use-cases.



Conclusion

Although we are not going to see a blockchain technology causing a paradigm shift in the near term, we are most definitely seeing a voracious interest in the underlying technology and its cross industry potential use cases.

While the Financial Services sector is beginning to respond to the threat and opportunities made possible by Blockchain technology, other industries should also keep a close eye on all things Blockchain. In subsequent articles, we will explore and speculate on the next generation of Blockchain applications that are likely to affect a whole host of industries ranging from travel to retail, and even music.

In light of this continuing focus on blockchain Deloitte's objective is simple, our goal is to help our clients:

- Understand what blockchain technology is
- How it can impact their industry and business
- Harness the technology (be on the front foot)
- Contextualise the buzzword and make it real by identifying specific use cases which can be implemented in a short time frame with minimal risk



Contacts

For more details please contact:



Lory Kehoe
Senior Manager
Strategy & Operations – Financial Services
Consulting
Dublin, Ireland
+353 (1) 417 2300
lkehoe@deloitte.ie



David Dalton
Partner
Strategy & Operations – Financial Services
Consulting
Dublin, Ireland
+353 (1) 417 4801
ddalton@deloitte.ie



Cillian Leonowicz
Manager
Strategy & Operations – Financial Services
Consulting
Dublin, Ireland
+353 (1) 417 3249
cleonowicz@deloitte.ie



Thomas Jankovich
Partner / Principal
Strategy & Operations
Consulting
United States
tjankovich@deloitte.com

Dublin
Deloitte
Deloitte & Touche House
Earlsfort Terrace
Dublin 2
T: +353 1 417 2200
F: +353 1 417 2300

Cork
Deloitte
No.6 Lapp's Quay
Cork
T: +353 21 490 7000
F: +353 21 490 7001

Limerick
Deloitte
Deloitte & Touche House
Charlotte Quay
Limerick
T: +353 61 435500
F: +353 61 418310

www.deloitte.com/ie

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/ie/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu Limited and its member firms.

With nearly 2,000 people in Ireland, Deloitte provide audit, tax, consulting, and corporate finance to public and private clients spanning multiple industries. With a globally connected network of member firms in more than 150 countries, Deloitte brings world-class capabilities and high-quality service to clients, delivering the insights they need to address their most complex business challenges. With over 210,000 professionals globally, Deloitte is committed to becoming the standard of excellence.

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, Deloitte Global Services Limited, Deloitte Global Services Holdings Limited, the Deloitte Touche Tohmatsu Verein, any of their member firms, or any of the foregoing's affiliates (collectively the "Deloitte Network") are, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your finances or your business. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser. No entity in the Deloitte Network shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

