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Blockchain:

A revolutionary change or not?

November 2017

History of Blockchain

The Blockchain was first defined in the original source code for Bitcoin. Thus, it is worth looking at the history – the two, together.

Creation of Bitcoin
October 2008

- Paper entitled "Bitcoin: A Peer-To-Peer Electronic Cash System", published under the name Satoshi Nakamoto
  - Peer-to-peer electronic transactions and interactions without financial institutions
  - Cryptographic proof instead of central trust
  - Put trust in the network instead of in a central institution
- Within three months, Bitcoin v0.1 was released and the first Bitcoin transaction was recorded

Bitcoin: First to Implement Blockchain

- The underlying technological innovation of Bitcoin was a distributed ledger with cryptographic integrity named **"Blockchain"**
- Following the first implementation of Blockchain in Bitcoin, the term "Blockchain 2.0" was popularized to describe new applications of the Blockchain technology

Blockchain Today

- Organizations all over the world in the public and private sectors are currently exploring potential applications of Blockchain technology

Sources: Pilot 101 Blockchain Content Draft – BTAAC; The Business Blockchain, William Mougayar

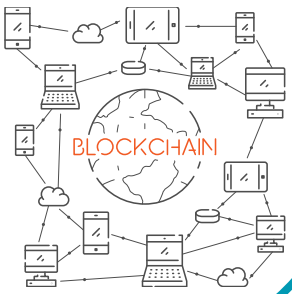
What is Blockchain Technology?

Blockchain is the technology designed to make transactions (or data) more secure by recording the information in not just one location, but over a network of computers, making it tougher to tamper with.

- Each member in the network maintains his or her own copy of the information and all members must validate any updates collectively - each update is a new "block" added to the end of the "chain".
- Entries are permanent, transparent, and searchable, which makes it possible for community members to view transaction histories in their entirety.
- All the members in the network have copies of the entire record of information
- The values could represent transactions, contracts, assets, identities, or practically anything that can be described in digital form.

Very unique characteristics of Blockchain create a unique potential to transform the financial services infrastructure which are as follows:

Blockchain "The Internet of Value"



Real time: Enables the near real time settlement of recorded transactions, removing friction, reducing risk but also limiting ability to charge back.

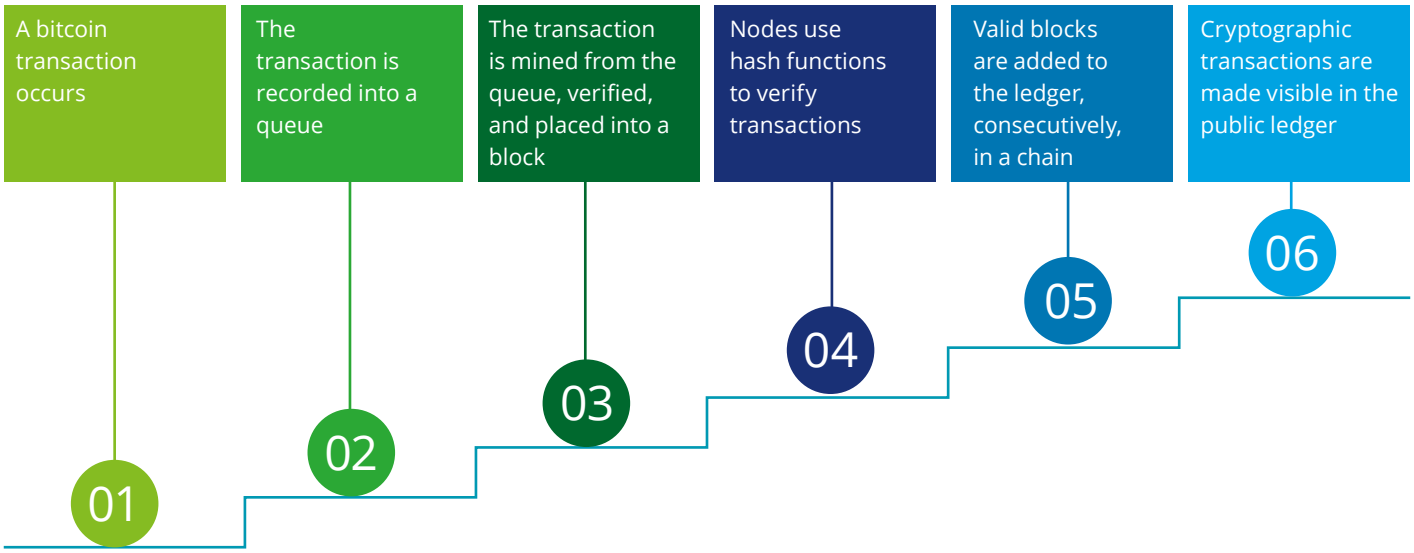
No Third Party or Intermediary: Uses cryptographic proof instead of trust, allowing any two parties to transact directly with each other without the need for a trusted third party.

Shared and distributed ledger: Records a history of transactions through peer-to-peer distributed network. The blockchain preserves only the proof of the transaction existence.

Irreversibility: Contains certain and verifiable record of every single transaction ever made. This prevents double spending, fraud, abuse and manipulation of transactions

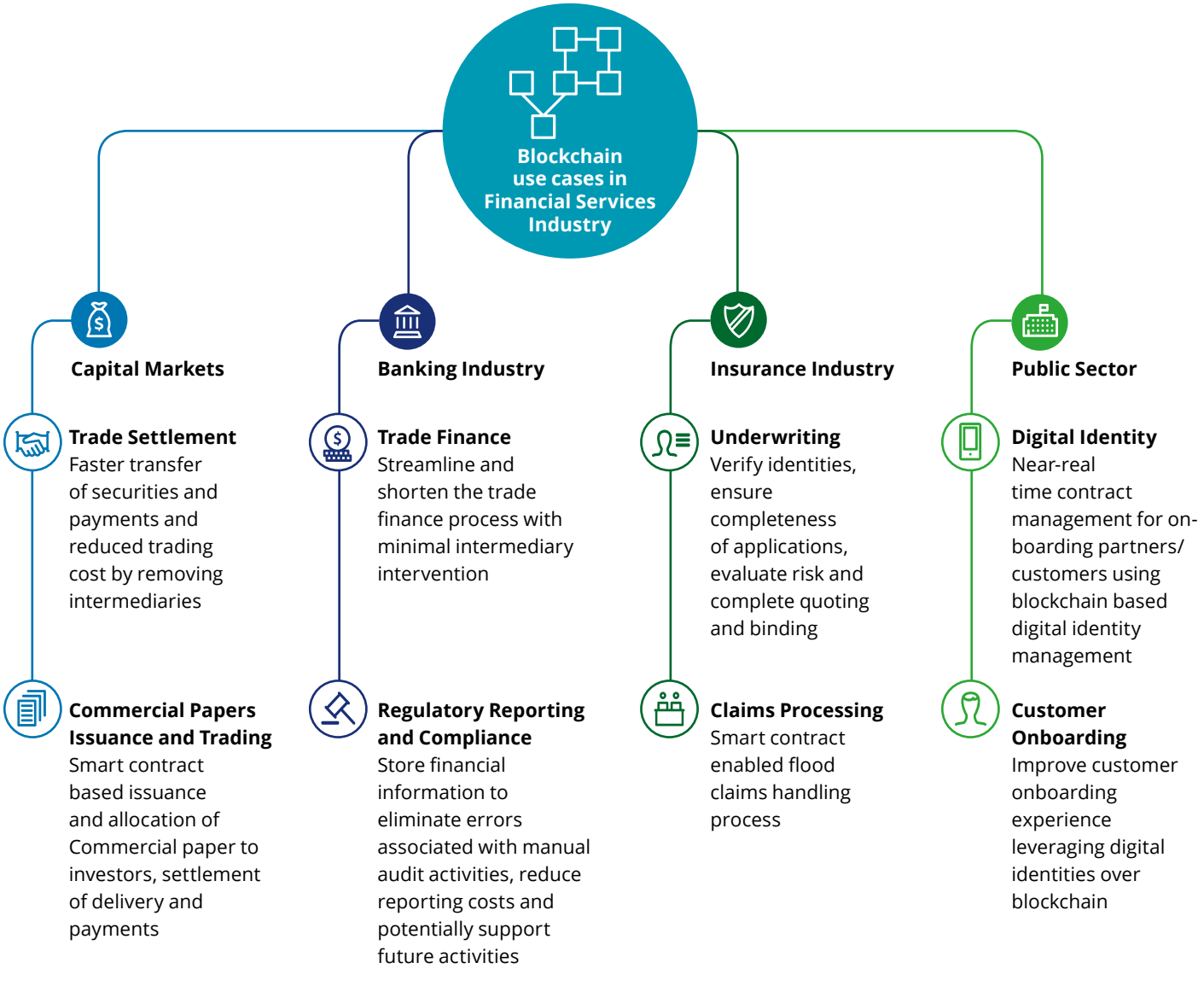
Censorship resistant: Crypto economics ensures that the blockchain continues pumping out new blocks and that blocks are not being reverted or altered.

Blockchain Transaction Overview



Source: Deloitte Analysis

Blockchain Use Cases in Financial Services Industry

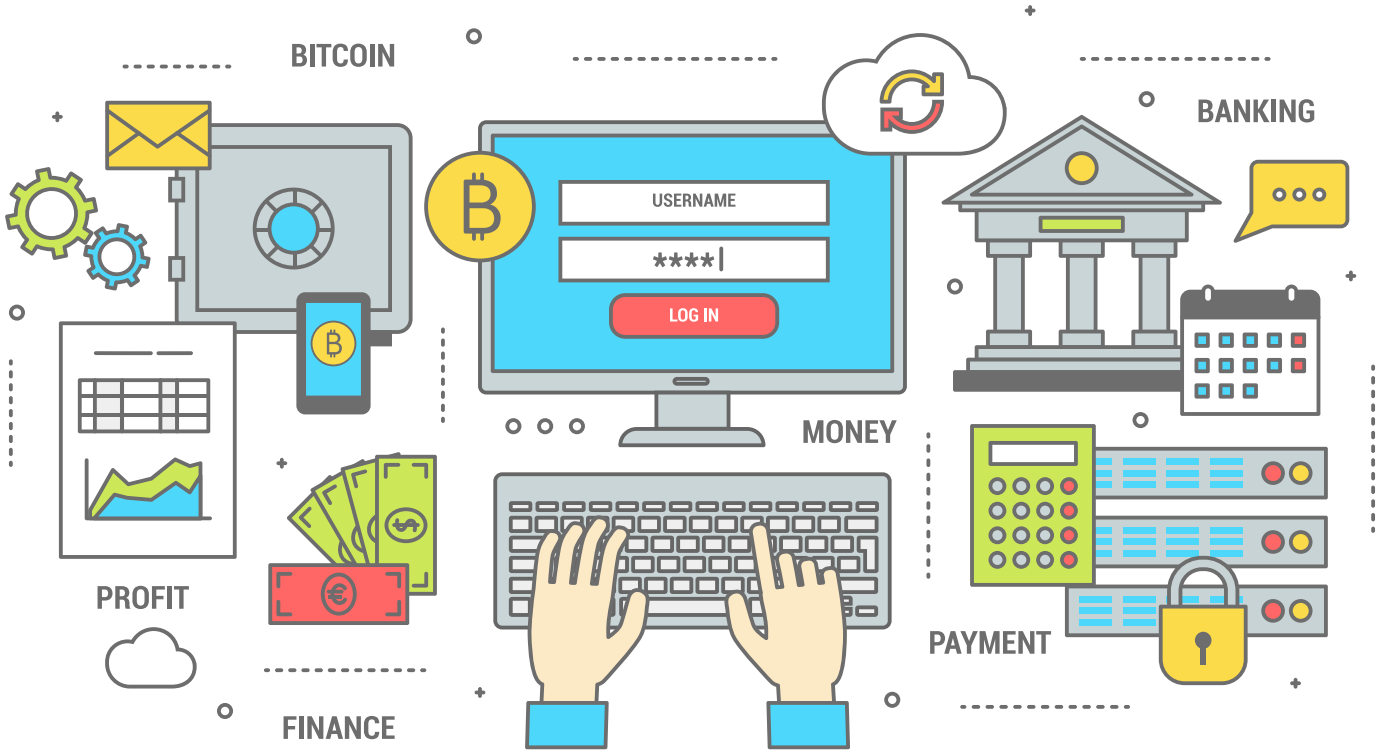


Source: World Economic Forum report on "The future of financial infrastructure", Industry Reports

Blockchain Use Cases across Technology, Media and Telecom Sectors

Technology	Media	Telecom
IoT Connectivity Enable secure decentralized mesh networks for millions of IoT devices to interconnect, supporting scale while eliminating single points of failure and avoiding threats such as spoofing and impersonation.	**Digital Rights Management** Blockchain stores a hash of the original digital file and associates it with the creator's identity. Smart contracts enable real-time allocation and distribution of royalty payments according to actual usage rates.	**5G Enablement** Connectivity platform to enable new generation of access technology selection management, required for the realization of 5G network potential.
Supply Chain Traceability Register time, location, price, parties involved, and other relevant information each time an item changes ownership. No one party is able to manipulate ledger to their own benefit.	**Pricing for Paid Content** Blockchain-enabled micro-payments allow publishers to sell individual articles or other pieces of content at sub-dollar amounts without disproportionate transaction costs.	**Identity-as-a-Service** Provide eSIM solution and authentication services based on cryptographic identity, enabling new revenue streams for CSPs.
IoT Machine-to-Machine Transactions Blockchain acts as a Ledger of Things, allowing every registered device to identify/authenticate one another without the need for central brokers or certification authorities.	**Disintermediation of Content Aggregators** Together with blockchain-enabled content usage tracking and micro-payments, content creators can establish direct relationships with their customers and sell directly to their fan base without intermediaries like record labels.	**Fraud Management** Implement blockchain for data and value exchange within and between networks to reduce subscription identity and roaming fraud.
Customer Data Management Blockchain can anonymize large amounts of customer data while still allowing it to be used to drive strategic and marketing decisions.		
Electronic Document Management Decentralize document flow for business, individuals, and government by registering documentation on the blockchain to protect documents from unauthorized changes, false representations, and loss.		

Source: Deloitte Analysis; Secondary sources



Potential Challenges to Mainstream Adoption of Blockchain

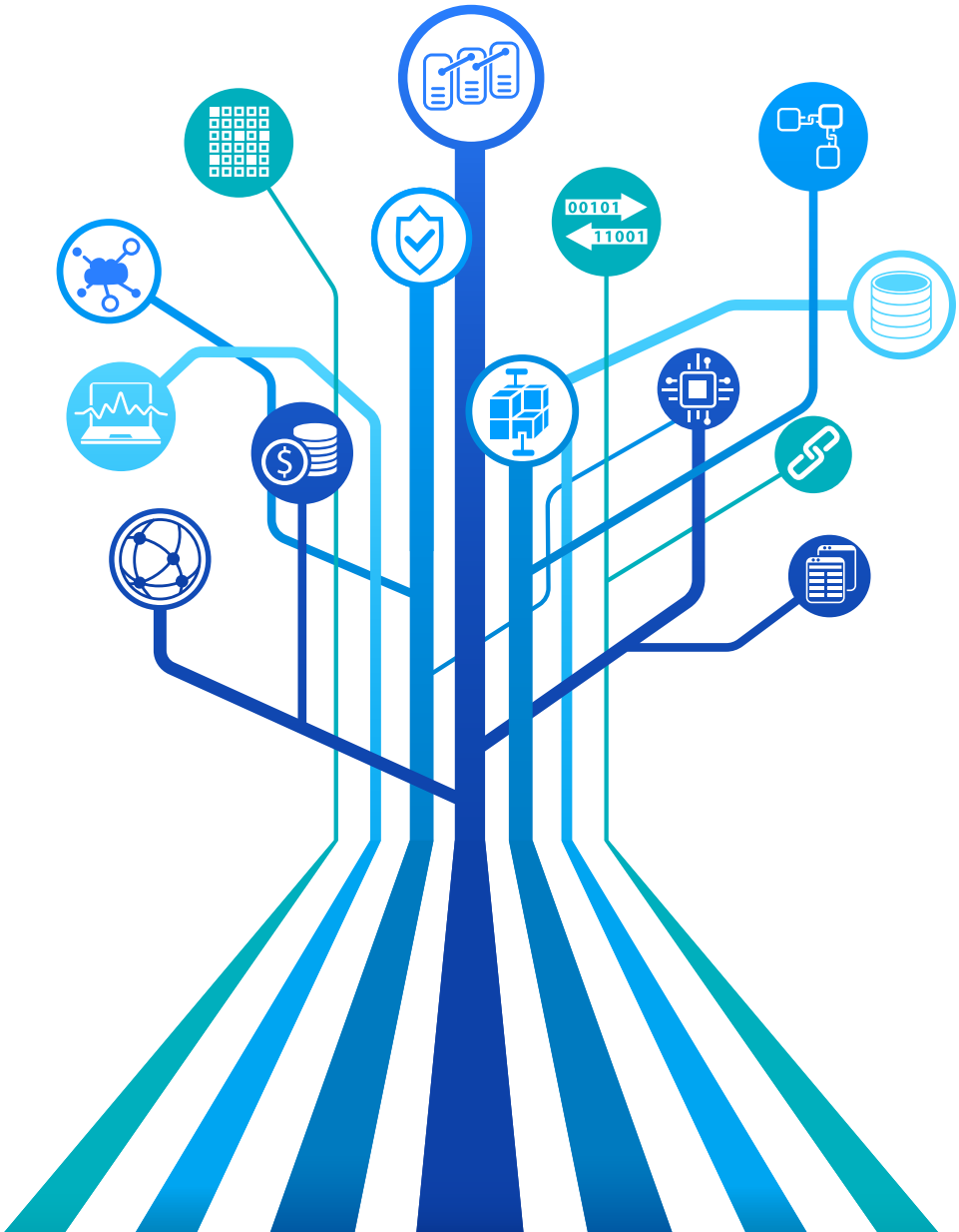
Blockchains are not without their hurdles. While blockchain has immense potential to the society, it is also recognized that this is hard to achieve without substantial regulatory will and collaborative effort from all parties involved.

- **Total transparency a double-edged sword:** The demand for change in business processes (transaction processing) will come either from the grassroots demanding that certain data go on a blockchain and form a record which cannot be subsequently edited, or from regulators and policymakers mandating such change.
- **Requires a lot of coordination:** Blockchains can also be used in industry platforms for the sharing of data that is helpful to the industry as a whole. In this case, a majority of players in an industry need to come together and agree on what such a platform would look like, who would pay for it, and what value each participant would get from it.
- **Regulatory clarity over data sovereignty:** Regulatory clarity of on and off-chain assets is something that is often discussed, in the context of bitcoins and the issues of data governance of a share certificate on a blockchain. What is often neglected is regulatory clarity over data sovereignty. In an industry blockchain, the same data is copied over many data centres, often in different countries. A lot of the data are encrypted so that only the intended recipient can see it. In some industries this is fine, but in an industry such as financial services, control of data is heavily regulated. Are banks comfortable sending, receiving, and storing data without knowing exactly what they are storing in their data centres? Are regulators comfortable with banks in their oversight storing unknown, encrypted data? Are banks comfortable with their competitors storing their data, encrypted or otherwise? After all, a blockchain replaces a trusted third party with a network of participants but in the case of an industry blockchain, many participants will be competitors.

Conclusive Remarks

Blockchain today may be compared to what the Internet was in the early 1990s. While we have witnessed how the 'Internet of Information' has changed our society over the past two decades, we are now entering a phase where Blockchain may do the same by ushering in a new paradigm comprising 'Internet of Trust' and 'Internet of Value'.

The financial services industry may be one of the firsts to be impacted by wider adoption of Blockchain and its associated Distributed Ledger Technologies. The extent of this impact is contingent on how nimbly the industry players capitalize on this technology and the nature of support it garners from wider stakeholders.



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