



Blockchain: A Ground-Breaking Disruptive Technology or A Passing Fad?

Emerging Risk Categories: Economic & Technological

Key Industries Impacted: Government; Financial Services; Technology, Media & Communications; Consumer Products & Services

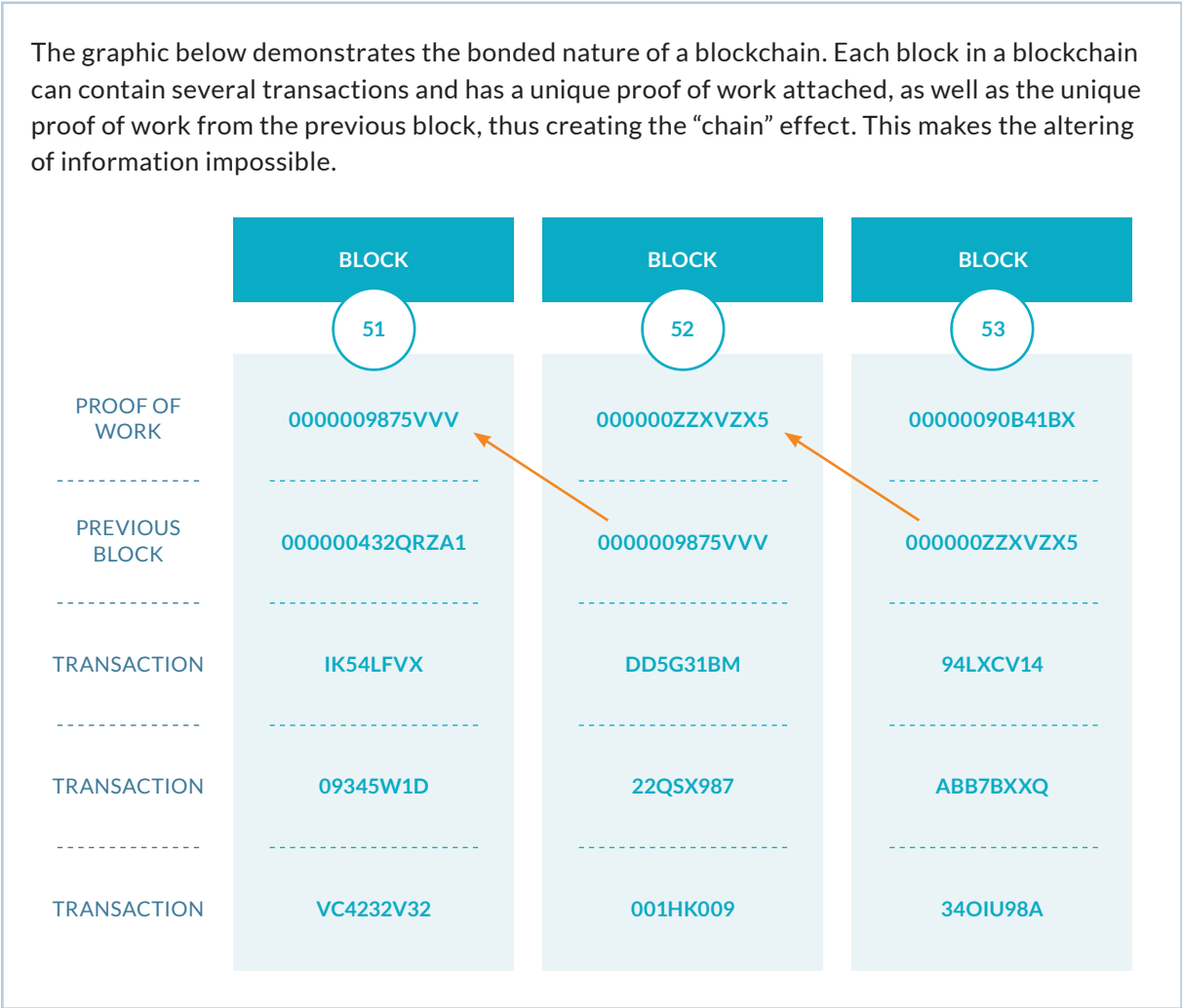
Bitcoin is a controversial cryptocurrency the potential of which remains significant, even though its popularity has flatlined in recent years. We covered the topic on two separate occasions — in *PreView* Volume 1, *Issues 1* and *2*. While Bitcoin may be the better known concept and term, it is now becoming apparent that the technology behind Bitcoins — blockchain — may take center stage as the real revolutionary innovation. Blockchain is a potentially very secure ledger of digital events that is shared between all parties that participate in the events, with the parties' identities being protected by cryptography. The record of events can only be updated after a consensus from 51 percent of the participants, and once information is entered, it can never be erased. Blockchain technology therefore can operate without any central authority.

From a technology perspective, the blockchain moves beyond the single cryptocurrency focus of Bitcoin to represent a variety of cryptocurrency-based applications. While the underlying technology concept may appear analogous to a database due to the blocks within the chain containing the data, blockchain is more a unique data structure than a database. The blocks represent the transaction log of a specific database implementation that constantly grows as “completed” blocks are added in a linear, chronological order

with a new set of recordings. Blockchains are more secure in that falsification of recorded information is harder and accidental errors are much less likely. As a result, the blockchain technology represents a paradigm shift for developers and users, and it will impact how software engineers will write software applications in the future.

Over the next two pages, we discuss various blockchain considerations, implications and application.

- • • **Example of a Blockchain**



- • • **Key Considerations and Implications**

Blockchain has gained popularity due to the many benefits it provides. The full power of blockchain is still to be determined, and so are the potential drawbacks. Below are some of the key reasons for its adoption, and a few drawbacks already identified.



Efficiency and lower costs due to ledger format: Because entries on the blockchain ledger are immediately validated, blockchain technology can lead to quicker, more efficient transfer of assets and/or data. For investment banks, this can lead to more efficient asset trading by eliminating certain back-office tasks and reducing the time between initiating a trade and receiving the asset. Over 42 global banks have joined fintech consortium R3, which [recently partnered with Microsoft](#) to develop a framework and a platform for applying blockchain technology to markets in the hope of saving billions in future costs.



Greater transparency in transaction activity: At every stage in a blockchain transaction, the network of participants in the event must agree to the latest block of transactions. This agreement is reached through majority consensus, with duplicate entries eliminated. Unlike a bank ledger, which can be altered by its owner (or a government), the blockchain cannot be changed without simultaneously overwriting all of the thousands of copies used by the participants at any one time. As a result, individuals who do not know or trust each other can transact or exchange assets safely and reliably. One potential drawback is the public nature of the transaction: Because all users must agree on the blocks of transactions, all activities performed are public. While participants' identities are disguised via pseudonyms, their activities are still visible, which could pose a potential privacy concern for some users.



Security stemming from multiple users: One of the key benefits of the blockchain is the ability to execute transactions without the help of a third-party intermediary, such as a bank. The blockchain ledger is distributed across thousands of computers, so hacking the ledger is nearly impossible. Additionally, because no single authority has control, the fault of one system will not affect the whole network.



Applicability across multiple industries: The blockchain efficiencies referenced above are applicable across multiple industries. Applications built on top of blockchain technology can automate the processing of property titles, clear interbank settlements, replace the need for user names and passwords and revolutionize many other processes. Companies in all industries should be paying attention to this disruptive trend, as it can drastically alter the need for their services. See the "Spotlight" section on the next page for more information.



Vast amount of computing power necessary: Some critics point out that blockchain technology will have diminishing network capacity and would not be able to sustain large-scale usage. For example, Bitcoin in its present form can process [just seven transactions per second](#), whereas a large credit card company like Visa can comfortably take on tens of thousands.

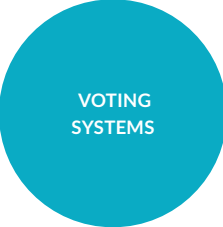


Regulations still to be determined: While blockchain is still a relatively new concept, the interest which surrounds it means that regulators will likely react quickly by creating regulations to ensure blockchain is used for legitimate activities — as well as to perhaps obtain a share of the taxes associated with transactions. As regulators become more educated on blockchain and determine the means to regulate it, companies looking to utilize the technology should stay informed and keep an eye on any changes in the regulatory landscape.

A decentralized online marketplace consists of a network of members without a central location who engage in transactions arbitrated by other marketplace members. Many such marketplaces are currently in development, with some providing their own cryptocurrency, such as Syscoin, and others, like OpenBazaar, using Bitcoin as a medium of exchange. OpenBazaar has received over \$1 million of funding from investors and is touted as a “decentralized eBay.” However, since Bitcoin transactions cannot be blocked, there is a concern that the marketplace could be flooded with illegal contraband. While OpenBazaar has not yet been associated with any illegal activities, it remains to be seen what the startup will do to combat the potential misuse of its services.

Smart contracts are blockchain-enabled programs that can record the execution of various stages of a contract and complete it once all the terms are met. Every member of the blockchain cryptographically protects and powers the contract, ensuring objective and nondiscriminatory execution. Applications of smart contracts could include invoices, loans, inheritances and trade contracts, among many others. Platforms for smart contracts include Ethereum and Linq.

- **The Linq application**, launched by Nasdaq Private Markets in 2015, is a blockchain ledger platform that enables private companies to conduct securities transactions prior to going public. It is the first blockchain platform from an established financial services firm. The first-ever private securities issuance documented with blockchain technology was executed on Linq in December 2015.
- **Ethereum** runs on a custom-built blockchain that can handle more data than Bitcoin’s blockchain, allowing for more complex algorithms – for example, creating an invoice when a shipment is dispatched and providing a receipt once payment is made. Ethereum comes with its own programming language used to build the smart contracts. The Swiss-based firm was **crowdfunded to the tune of more than \$18 million** in August 2014.



Cryptocurrencies are entirely digital currencies – simply an entry on the ledger of a blockchain. Because the blockchain technology behind cryptocurrencies does not exist in one central location or institution, cryptocurrencies have the potential to reduce reliance on banks and other institutions as gatekeepers to the financial system. Central banks recently have begun to experiment with their own cryptocurrencies, seeing several benefits: Cryptocurrencies do not require printing, are harder to forge, and make issuing money significantly easier. Furthermore, electronic currency cannot be moved around without a trace as physical money can. In light of the recent Panama Papers leak and other anti-money laundering (AML) concerns, traceable transaction records offer a huge advantage to central banks.

Recently, a blockchain platform named **Waves raised \$2 million** in the first 24 hours of a crowdfunding campaign. The platform uses blockchain tokens, which are issued by a platform member in exchange for existing national currencies, financial instruments, and other items with inherent value. In this manner, the platform allows traditional financial institutions to issue and support blockchain tokens, and is therefore a step forward in closing the gap between the current financial system and the cryptocurrency world.

For decentralized marketplaces to function, it is necessary to establish tamper-proof identities – which is what a company called **Onename** is aiming to do. With **Onename**, a person can link a blockchain identity to email signatures, social media and other applications to allow others to verify that person’s identity. Another company, **MyPowers**, provides technology allowing this identity to be used to establish ownership of digital property.

Nasdaq recently announced its plans to allow residents of Estonia who are registered shareholders in the Tallinn Stock Exchange to vote in shareholder meetings via the Linq blockchain ledger platform. This will significantly impact the way in which shareholders and management communicate securely over long distances. Combined with the identity management described above, blockchain could revolutionize many other polling and voting processes. Since the voting is recorded on the blockchain, it will be authorized by the individual and authenticated by every user, making it extremely hard to forge or replicate.

Where to Learn More

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