



## TECHNOLOGY |

# BLOCKCHAIN: DISRUPTION AND OPPORTUNITY

BY NATALIA MASLOVA, CMA, CTP, PMP

July 1, 2018



**T**he buzz around blockchain is spreading quickly around the globe. Finding someone in the corporate world today who *hasn't* heard of blockchain is difficult. Yet not everyone understands how blockchain works and what it can do for business. Most probably know it primarily for its connection to bitcoin and other cryptocurrencies, but blockchain has far more potential uses in business. As it is developed further and its use grows, blockchain can provide an opportunity for exponential disruption and innovation.

# WHAT IS BLOCKCHAIN?

Blockchain is a distributed ledger and immutable database for transferring data very securely. The name is a combination of two words—the “block” that contains batched transactions and a “chain” that represents cryptographically linked blocks. Once the transactions are confirmed, the block is formed, time-stamped, and added to the previous block.

Various types of transactions can be performed on blockchain. Some well-known examples are the purchase or sale of physical (represented in the form of tokens on blockchain) or digital assets, such as cryptocurrency, raw materials and finished goods, stocks and bonds, and so forth; the movement of inventory from one warehouse to another; and change in ownership, such as the transfer of a car title or property deed.

## IS BLOCKCHAIN A FIT?

EY developed a five-point test to help determine if blockchain could be the right solution for a business problem. If you answer “yes” to at least three of these questions, then blockchain could be a fit.

- 1** **Are there multiple parties in this ecosystem?** (Blockchains are fundamentally multiparty collaboration systems.)
- 2** **Is establishing trust between all parties an issue?** (Blockchains improve trust between participants by having multiple points of verification.)
- 3** **Is it critical to have a detailed transactional record of activity?** (If everyone agreed on everything, you wouldn't need a blockchain to verify who did what and when it was done.)
- 4** **Are we securing the ownership or management of a finite source?** (Core logic in the blockchain system is designed to prevent double-counting of assets and to record ownership and transfers.)
- 5** **Does the network of partners benefit from increased transparency across the ecosystem?** (Blockchains are transparent by design.)

Blockchain represents an innovative combination of existing technologies such as peer-to-peer networking, cryptographic hashing functions, and consensus protocol, among others. There are a number of key elements to blockchain that make it so potentially disruptive, including:

- **Distributed ledgers.** Everyone participating in a blockchain network keeps a copy of all the transactions. It enables a truthful and immutable record since it's virtually impossible to tamper with historical records that are stored on multiple computers or nodes.
- **Smart contracts.** These can be used to deploy business logic. They can represent contractual terms between parties or rules associated with a particular workflow. The key benefit of smart contracts is autonomous execution and real-time transactions. Smart contracts can reduce enforcement and compliance costs, litigation, and complexity while improving decision making and speed of operations.
- **Consensus algorithm.** All (or a majority of) parties agree to network-verified transactions. This is the mechanism to confirm transactions without an intermediary, i.e., one central decision maker.
- **Cryptography.** Once transactions are made, cryptography is used to confirm authenticated and verifiable transactions. The blocks are also linked and secured using cryptography so that the data can be read only by the appropriate users.
- **Permission.** This ensures that members of a network can only see items in ledgers that are relevant to them.

## TYPES OF BLOCKCHAIN

Blockchains come in different shapes and sizes. Based on the participants, they're categorized as public, private, or hybrids. A similar comparison would be the difference between the public internet and a company's intranet.

In a public blockchain network, no permissions are required to join. Bitcoin, for example, is probably the most well-known cryptocurrency based on a public blockchain and, for many, their first exposure to the blockchain concept. Bitcoin was launched as open-source software in 2009. Its creator—an unknown person using the name Satoshi Nakamoto—first described the concept of a peer-to-peer electronic cash system in a 2008 white paper before creating the bitcoin network.

Since the introduction of bitcoin, more than 1,600 other cryptocurrencies have been launched. Over the years, there has been considerable price volatility in the crypto-market, but that shouldn't be confused with the underlying technology, which was the first real proof that blockchain can work in the public network environment.

In contrast to public networks, private blockchain networks are limited to designated members, with permission needed from an owner or managing entity. These are used mainly by corporations to manage industry value chain opportunities.

Consortium, or federated, blockchain is an example of a private network. In this type of network, permission and access is controlled by a group of entities rather than one organization. Each entity operates a node in the network, and there must be some kind of consensus among the entities for a block to be valid. The number of blockchain industry consortia is increasing year-on-year. Industry consortia help to combine efforts, funding, and ideas and to test technology in real time with real participants.

Hybrid blockchain networks allow participants in public or private networks to communicate with each other, enabling transactions between them across networks.

## BLOCKCHAIN USE CASES

Blockchain development largely has been performed in the open-source environment. Open-source blockchain platforms lead to more collaboration in technology development, standardization, and innovation. This growth and development of blockchain platforms has led to a variety of uses across different industries and for many different purposes.

### Supply Chain

Blockchain solves a variety of business problems, including inaccurate inventory levels, the inability to achieve volume discounts on raw materials, product and raw materials fraud, and the inability to manage product recalls in a timely manner.

If you examine how business transactions are performed today, you can see that there's a massive number of disconnected ledgers that exist across different industries, companies, and even within one company. Every company likely has at least one enterprise resource planning (ERP) system. And that ERP system is either unconnected or only partially connected to the ERPs of their customers or trading partners—for example, through Electronic Data Interchange (EDI). As a result, there's a lack of transparency as well as delays in processing transactions, and a significant amount of time is spent on reconciliation and validation activities.

The concept of ERP, developed decades ago, has seen some innovation and change over the years, but there's still no common environment for businesses to operate in. Blockchain could enable that common environment, which is one of the reasons why blockchain provides an opportunity for exponential disruption in how companies do business today. It's unlikely that blockchain will replace ERP in the near future, but what it does offer today is a shared ledger environment for vendors and clients that can be integrated with each participant's ERP system.

ERP vendors such as SAP and Oracle have begun to experiment with blockchain and include it in their product roadmap. For example, blockchain is a part of SAP Leonardo, the digital innovation platform. We'll likely see more progress in this area in the coming years.

Walmart, Carrefour, Nestlé, Unilever, and other retailers are actively exploring blockchain capabilities by conducting testing in the area of food traceability and safety. Product provenance is particularly important, and it can increase consumers' trust and loyalty. This applies to the pharmaceutical industry as well, where drug counterfeiting is a multibillion-dollar issue leading to safety concerns for consumers and lost revenue for manufacturers.

## Financial Services

Finance and banking are other areas where blockchain can provide an alternative to existing processes and systems. The complexity of trade finance, for example, is associated with many manual checkpoints, multiple disintegrated platforms, the increased role of the banking industry due to tightened regulations, and other challenges. It leads to both payment and shipment delays and higher costs.

In banking, EY estimates that between 50 and 100 working days are lost each month reconciling differences within a typical finance team at banks and insurers. Adopting a shared-ledger approach significantly reduces the number of reconciliations required.

Assets can be created or represented on a blockchain and securely and efficiently transferred between parties. Today it takes two business days to settle stock trades (T+2 settlement cycle). Blockchain can significantly reduce settlement time and associated credit and market risks.

The use of smart contracts for processing insurance claims can improve turnaround time, reduce costs, and provide seamless claim processing experience. Last September, Axa, a French multinational insurance firm, launched Fizzy, an automated and secure platform for parametric insurance against delayed flights.

## Automotive Industry

Blockchain is well positioned to become prominent in the automotive industry in the same way as disruptive technologies such as high-performing GPS, sensors, artificial intelligence, and machine learning. Many automakers have started to explore blockchain technology for use in the supply chain, car service, security, and for autonomous vehicles.

The value chain of the automotive industry—including procurement, manufacturing, and distribution and service functions—will benefit from the distributed, immutable, and resilient nature of blockchain technology.

Earlier this year, BMW, Ford, Renault, and General Motors announced the formation of the Mobility Open Blockchain Initiative (MOBI). Its mission is to make mobility services more efficient, affordable, greener, safer, and less congested by using blockchain and other related technologies. According to MOBI, the use cases in scope include supply chain, congestion fees, autonomous machine payments, car and ride sharing, usage-based insurance, and pollution taxes.

In June 2017, Daimler AG announced that it successfully tested blockchain technology in partnership with Landesbank Baden-Württemberg by issuing a corporate bond worth €100 million. According to Daimler, the entire transaction cycle—from origination, distribution, allocation, and execution of the loan agreement to the confirmation of repayment and of interest payments—was automated through a blockchain network. If autonomous vehicles become a reality, they will likely change the traditional business models currently used by auto manufacturers and dealers. Transportation as a service can replace, at least partially, today's vehicle ownership model and create new revenue models and opportunities that can be accommodated by blockchain.

## Public Sector

Governments can improve efficiency in such areas as contract execution, social services, customer service and experience, risk management, transparency, and fraud. Blockchain enables a wide variety of transactions, including collecting taxes, delivering welfare benefits, issuing documents, and recording properties.

In April 2018, 22 European countries signed a declaration on the establishment of a European Blockchain Partnership. Mariya Gabriel, commissioner for Digital Economy and Society, said, "In the future, all public services will use blockchain technology. Blockchain is a great opportunity for Europe and member states to rethink their information systems, to promote user trust and the protection of personal data, to help create new business opportunities, and to establish new areas of leadership, benefiting citizens, public services, and companies."

The EU Blockchain Observatory and Forum is another initiative launched earlier this year by the European Commission. The objectives include knowledge sharing that can help accelerate blockchain innovation, explore blockchain use cases that can be used by EU governments, raise awareness, and provide training.

## Healthcare

Blockchain can help address the issues of medical records interoperability, data standardization, protection, and scalability. The idea is to allow patients to securely share their data with various medical services providers, pharmacies, insurance companies, and research institutions.

Further, connecting all medical devices on a blockchain platform would connect patients, providers, and payers to better understand who's complying with treatment regimes and their associated outcomes.

Last year, the U.S. Food and Drug Administration (FDA) and IBM Watson Health formed a partnership to explore potential use cases for blockchain in healthcare. According to *ComputerWorld*, they will "explore the exchange of patient-level data from several sources, including electronic medical records (EMRs), clinical trials, genomic data, and health data from mobile devices, wearables, and the Internet of Things."

# ADOPTING BLOCKCHAIN TECHNOLOGY

The banking industry was once quite skeptical about blockchain, but things changed rapidly once banks started to test the technology about two to three years ago. Cryptocurrencies and other assets represented in a form of tokens that can be exchanged on blockchain directly without involvement of a third party that would normally charge for services provided a potential threat of disintermediation of the financial services market.

Major banks started to do proofs of concepts and form industry consortia to explore and test blockchain technology. Several banks joined the we.trade project, a trade finance platform empowered by blockchain. Consortia are also being formed to develop standardized solutions suitable for multiple industry players. The more participants there are on a decentralized network, the more benefits can be harnessed from blockchain.

Today we see major banks developing decentralized ledger technology (DLT) strategies and building a pipeline of blockchain projects. The development of blockchain use cases started with payments and has quickly progressed to more complex use cases in capital markets. Nonfinancial services industries are now catching up by experimenting and identifying applicable use cases.

Across all industries, there are still some challenges that explain why adoption isn't as fast and straightforward as it could be. Here are some of the key success factors required for the mass adoption of blockchain:

**Widespread understanding.** Many professionals aren't fully aware of how blockchain works and of its benefits. Some people may associate blockchain only with the hype around cryptocurrencies. While the blockchain community is very active, vibrant, and collaborative, only a small percentage of professionals can implement use cases for their business. Education is an important ingredient in the mass adoption of blockchain.

**Maturity of blockchain technology, interoperability, and standardization.** Developers are still working on sustainable solutions for the scalability issue. The number of network participants and transactions performed on a blockchain network may have an adverse impact on speed of transactions. In order to compete in speed with the existing solutions such as Visa, more development and research is required.

Currently, various companies use different and disintegrated platforms and solutions to test blockchain technology, and there's clear lack of an industry standard. Mass adoption requires interoperability and a certain level of standardization.

**Integration with legacy systems.** Blockchain as a platform for recording and confirming transactions will have to partially or fully replace existing legacy systems. Integration itself can be time-consuming and requires additional resources. For companies considering blockchain, a business case should be prepared to take into consideration all benefits and incremental expenses.

Regulatory and legal frameworks. Some regulations and legal frameworks may need to reflect more guidance with respect to blockchain technology. For example, blockchain could be used for tracking property ownership and transfer of property, but currently those transfers must be in writing.

Increasing the number of participants. As Lars Henneberg, head of risk management at A.P. Møller-Mærsk, said about Insurwave, a new, near-real-time blockchain-enabled platform to secure and streamline the marine insurance process, “The more people we can onboard, the faster this revolution can happen. But it needs more participants onboard to fuel that expansion.”

The decentralized nature of the technology can bring many business and societal benefits. Overcoming these current challenges will help to unveil the true potential of blockchain.

## THE FINANCE AND ACCOUNTING FUNCTION

Blockchain use cases can be relevant for the finance and accounting function. For example, intercompany transactions in an environment where disparate ERP systems are in place can be streamlined using blockchain. It can improve transparency and eliminate unnecessary reconciliation efforts. The optimization of procurement and supply chain operations on blockchain can impact and optimize the work of accounts payable or accounts receivable functions.

Similar to other technology implementations, finance and accounting teams may be involved in the business design of the solution, including the collection of business requirements and user testing. Finance teams may also be involved in business case preparation by estimating potential savings from the technology compared to business as usual. The business case may include various benefits from compliance justification to cost reduction. It’s important for management accountants to understand how the technology works and fits into the existing infrastructure to make sure potential savings and incremental expenses are taken into consideration properly.

## HOW TO GET STARTED

Most companies want to implement blockchain and harness the technology in small, incremental steps with proofs of concept built on private blockchains. In case of limited awareness among the key stakeholders, it’s important to help everyone in the organization understand the basics of the technology as well as its benefits.

Identifying specific use cases that can be implemented in a short time frame with minimal risk is a significant step in contextualizing the concept. Usually this is achieved through a facilitated brainstorming session where multiple use cases are identified and prioritized based on selected criteria. An experienced partner can help identify if blockchain is the right solution for those selected use cases, help assess the benefits associated with each cases in scope, and provide support throughout the journey from proof of concept to production.

# WHAT'S NEXT?

While blockchain solutions in production are still relatively limited globally, it's clear that there's greater interest in—and a better understanding of—blockchain and its benefits. Multiple proofs of concepts are completed already or are in progress, and some solutions are already in or close to production release. Companies and other organizations are putting more effort into development of the technology every day, and governments have started to take adoption seriously.

In addition to the progressive adoption of blockchain by enterprises, efforts to standardize blockchain platforms are under way with a focus on interoperability and standardization. We'll see more and more industry collaboration as a logical step from moving from proof of concept to production. SF



**Natalia Maslova, CMA, CTP, PMP**, is a senior finance and technology advisor and strategist with extensive experience in business transformation enabled by technology. She is currently EY's Blockchain Lead and helps clients to understand benefits of blockchain technology, use cases, and supports them with the full cycle of blockchain product development. Natalia also serves on the ICMA® Board of Regents. You can reach her at [www.linkedin.com/in/nmaslova](http://www.linkedin.com/in/nmaslova).



2

+ Show Comments

## SF MAGAZINE

CURRENT ISSUE  
PAST ISSUES  
PAST ISSUES ARCHIVE

## BLOGS

IMA MOMENTS  
IMA PULSE  
SF TECHNOTES

## TOPICS

CARL MENCONI CASE WRITING  
COMPETITION  
ETHICS  
GOVERNANCE  
IMA  
IMA PULSE  
ABOUT SF  
ABOUT IMA  
SF EDITORIAL GUIDELINES &  
SUBMISSIONS  
CONTACT US  
SUBSCRIBE

## TOPICS

LEADERSHIP & CAREERS  
MANAGEMENT  
MEASUREMENT  
REPORTING  
SMALL BUSINESS  
  
MEDIA KIT FOR ADVERTISERS  
IMA PRIVACY POLICY