

# CIO Essential Guidance: Blockchain

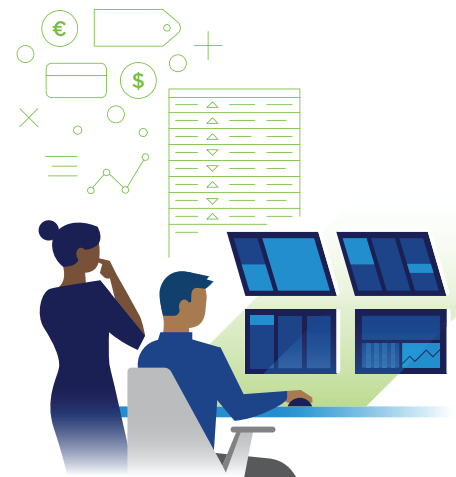
Blockchain is a technological advance that most people associate with cryptocurrency, and rightfully so. It is the backbone of currencies such as Bitcoin and Ethereum—when the concept broke ground, it captivated tech experts and the public alike,—had investors breaking down doors. Blockchain extends far beyond the financial sector, however, and is potentially on a trajectory to become commonly adopted within the enterprise. Is it worth considering for your business now?

Despite the market hype, only 11% of enterprises have deployed—or will deploy over the next year—even minimal, blockchain-inspired technologies<sup>1</sup>

So, why the gap between excitement and execution? As with any new technology, blockchain is not right for every business. And it's still maturing. Despite these factors, CIOs should prepare for its widespread adoption and the emergence of related technologies. Once blockchain's capabilities are operationally scalable worldwide, it will transform regular business practices as we know them. While many blockchain experts agree that the majority of enterprises should remain in a traditional database, there's a sizeable portion that stand to gain from investing in blockchain.

Consider blockchain for your business if:

- You work with large volumes of data
- You work with applications where trust of data is important
- You work with multiple distributed parties
- Processes are slowed down by having to reconcile information between multiple parties
- Your business is less efficient due to costly audits, decentralized visibility into shared documents and records, and timely reconciliations



**JUST 11% OF ENTERPRISES HAVE DEPLOYED OR  
PLAN TO DEPLOY BLOCKCHAIN TECHNOLOGIES!**

1. Gartner. "Understanding the Gartner Blockchain Spectrum and the Evolution of Technology Solutions". David Furlonger. Rajesh Kandaswamy. October 26, 2018.

## The power of the distributed ledger

Blockchain is a decentralized database where every data transaction is stored in blocks, time-stamped, and made available to the public. A traditional database is similar but because it is inherently centralized, it requires an admin who maintains complete control. This admin can create, delete, or modify information at will. If the database is large, running information through a central hub can also be slow and inefficient. Blockchain deviates from the traditional centralized database by transferring data across a decentralized platform, assuming no central owner of trust in a system. Verification is performed by networks of thousands of computers instead of by a single entity, and no single group has the power to control the data.

With blockchain, everyone has a copy of the same data (a consortium) in real time, and nothing can be altered or deleted. Blockchain guarantees verified data dissemination, provides accountability, and creates efficiencies in a variety of industries.

## Common use cases for blockchain

Blockchain made its debut in 2008 when Satoshi Nakamoto—a person or collection of people whose identity remains unknown—wrote the white paper Bitcoin: A Peer to Peer Electronic Cash System. This paper introduced blockchain as a database that could maintain the continually growing list of bitcoin records. Today, blockchain has expanded to verify and maintain a variety of forms of digital information.

While there are hundreds of discrete uses, the majority fall into one of four main categories:



### Asset transfer

Payment transfers, of course, are the poster child of blockchain. But anything that might change possession or ownership is also considered an asset. Blockchain enforces an immutable record of transfer and prevent fraud because each transaction is verified by and broadcast to the network ledger.



### Data distribution

Blockchain's distributed consensus model means that data is shared everywhere it needs to be shared via a peer-to-peer network designed to guarantee delivery. Because information doesn't run through a single entity, everyone participating in-stream via a blockchain node knows that as soon as their node gets a copy, everyone else gets an exact copy, too.



### Verifiable claims

Blockchain can be used to verify that you are who you say you are, and you have what you say you have. Proof of identity is a longstanding issue in the digital space, but the distributed consensus model provides an excellent verification mechanism and makes immutable the status of a person, place, or thing. If someone's status is updated in one place, it is updated everywhere. Blockchain technology is great for background checks or customer service efforts because information is always up-to-date and accurate.

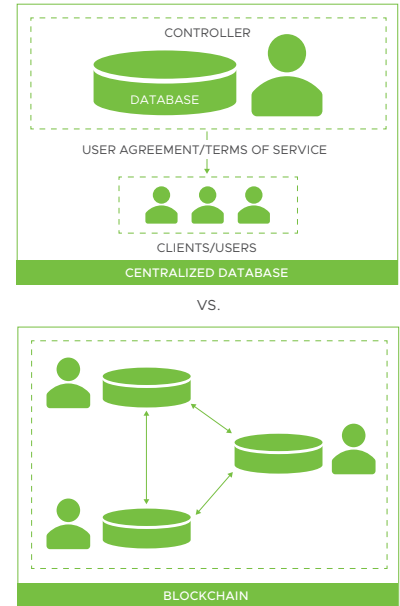


Figure 1: Centralized database vs. blockchain

## BLOCKCHAIN USE CASES



- Funds transfers
- Inventory transfer
- Deed transfer and recording
- Motor vehicle transfer
- Child adoption



- Supply chain management
- Disease reporting
- Emergency response networks
- Patient records



- Identity verification
- Digital transcripts
- Background checks
- Digital proof of ownership
- Court witness/experts
- Know your customer



## Asset and product tracking

Blockchain is typically implemented with an append-only immutable log. In a conventional database, a single field is updated to reflect a numerical transaction. In blockchain, the transaction gets written into a block. If another transaction is added, the field isn't updated to reflect a new total but rather another block is added, representing another transaction. This discrepancy allows businesses to better track transactions over time and see, for example, how an item moved through the supply chain.

## But is it for me?

Blockchain is an incredibly useful technology, especially in scenarios where trust in third-party data is critical. However, there are steps and best practices to follow when considering blockchain as a platform for operational efficiency and growth. From a data security and compliance standpoint, get legal on board from the onset. Implementing blockchain takes effort, including integrating with global and local systems that may not be using blockchain yet, and working with advanced cryptography that requires a new coding language your business may not be used to. For these reasons, the majority of blockchain efforts don't make it past the pilot stage.

## Getting started

It's critical to partner with a consultant who has experience in this space as well as connect with a consortium leader that can leverage its economic or data advantage to require stakeholders to join. Whether your business is that consortium leader or not, it's imperative that the leader have power to define the business requirements and recruit others to join. Without this type of leverage, blockchain efforts commonly fail, since the consortium can't get enough members to sign up.

Once a blockchain process is selected, you will build applications on top of the blockchain in a distributed fashion. At this stage, most organizations need to partner with a vendor that specializes in turnkey blockchain solutions. Additionally, blockchain success is dependent on the operationalization of certain solution domains such as multi-cloud, DevOps and automation.

The pilot phase can stop or stall any blockchain initiative. Many people hit a wall at this point because they're not able to scale out of the pilot fast enough, lack the transactional throughput, or face worries over security, audit, or operations at scale. Most blockchain strategies aren't set up to jump these hurdles. Often, companies go back and select another blockchain platform and go through the whole process again. It's important to get into an operational state early on and ensure the right people are running the program.

## Final thoughts

Blockchain is still evolving and there's still a lot to learn. It's worth reaching out to professional services consultants who have been in the space for years to decide if setting up your people, processes, and technologies for blockchain is worth any short-term pain associated with learning entirely new constructs and architectures. Make sure to analyze with the experts and your key stakeholders the challenges, opportunities, use cases, and risks associated with this evolving technology to best gauge the viability of blockchain for your business at this time. If it's the right fit for your business, the benefits will far outweigh the costs.

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## BLOCKCHAIN USE CASES



- Commercial shipping
- Maintenance and repair history
- Part history and provenance
- Critical data sets

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## A SECTOR THAT SEES A VERY REAL BENEFIT FROM BLOCKCHAIN ASSET TRACKING IS FOOD DISTRIBUTION AND SAFETY.

The outbreak of E. coli found in California romaine lettuce in 2018 stayed on the shelves long enough to infect 210 people across 36 states, killing five. It took 57 days for the CDC to announce the outbreak was over. One of the reasons for the two-month delay was that tracing the product back to the source was a step-by-step process that sometimes even included paper records. With blockchain, tracing products can take mere hours—saving time, a significant amount of cost and, in this case, lives—via digital, immutable, and easily-searchable ledgers.

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## CHOICE OF CONSENSUS MODEL IS KEY.

Decentralized trust starts with a consensus method—i.e., how you reach agreement on what gets written in your blockchain. Once your consortium is defined, select a blockchain process based on four key factors:

- The amount of trust you can place in the platform
- How well the platform scales
- How decentralized it can become
- Whether it has the tools to operate well in that decentralized space