

Blockchain in Health Care

Educational Briefing for Non-IT Executives

Executive Summary

Blockchain is a digital ledger that enables parties with no history of trusting one another to securely commit to contracts and record transactions, without the need for an intermediary such as a bank. While blockchain's major successes to date have been in finance, the technology has potential to provide value to health care, particularly in the areas of payment adjudication and supply chain integrity. Blockchain can improve the efficiency and predictability of the claims submission and payment process and guard against counterfeiting and theft along medical supply chains. Achieving this potential will depend on blockchain's ability to provide significant differentiated value from existing solutions, and adoption for most blockchain-based applications depend on having a network of trading partners who have adopted the same standard.

What is blockchain?

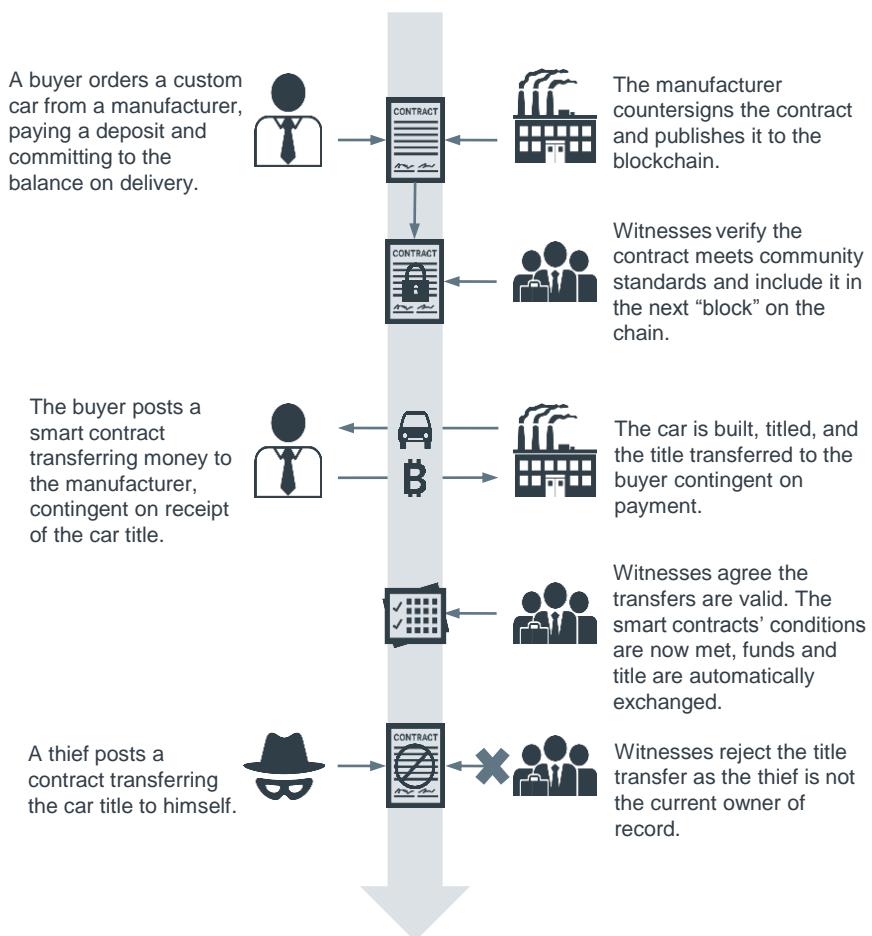
Blockchain technology allows decentralized communities of people and organizations to establish a single, shared record of events with confidence that no one can tamper with historical records once they have been verified.

Blockchain Features

Compared with conventional technologies that are largely focused on centralized systems of record, blockchain provides:

- 1 A Shared System of Record**
Every person in a blockchain is guaranteed to see the same historical record.
- 2 Consensus Without Individual Trust**
Blockchain participants do not need to know or have any specific trust in one another.
- 3 Tamper Resistance**
Once data has been recorded on the blockchain, it is effectively permanent.
- 4 Smart Contracts**
Digital contracts can be published to a blockchain and independent observers can assess whether the terms have been fulfilled. Payments or other actions can be automatically executed upon completion of a contract.

Anatomy of a Blockchain Transaction



How is blockchain used or applied in health care?

Blockchain has several potential applications in health care. Common areas of interest include:

- **Payment Adjudication:** Contracts between payers and providers, or providers and suppliers could be automatically adjudicated by a blockchain-based payment system, reducing overhead and payment delays.
- **Supply Chain Integrity:** Consumables and durable medical equipment could be tracked from the point of manufacture to consumption or decommissioning, providing verifiable authenticity and a clear chain of custody.
- **Audit Logs:** Blockchain's tamper-resistance makes it an attractive option for storage of audit or access logs.
- **Health Information Exchange (HIE):** Blockchain's decentralized model raises the possibility of peer-to-peer HIEs that do not rely on a central system or technology vendor. A patient's record could be stored in a blockchain and authorized providers could access and publish data into the record.
- **Medical Licensing and Credentialing:** Blockchain technology can be used to issue, share, and verify digital academic credentials. The Federation of State Medical Boards recently launched a [pilot](#) to test the use of Blockcerts, a blockchain-based open source standard, to create digital records for medical certification credentials.

Claims adjudications, maintaining supply chain integrity, and credentialing are the most promising applications. Although the needs of HIEs match blockchain's strengths in many ways, HIEs solve issues blockchain does not address such as governance, record location, and the intersection of incentives with policy. For audit logs, simpler alternatives to blockchain providing a high degree of tamper resistance are already available.

Why is it important?

Blockchain has potential to address current challenges and inefficiencies in health care.

- **Improved Process Efficiency:** Blockchain can streamline payment processes and add predictability to claims.
 A payer can publish pre-authorizations for procedures as smart contracts, payable automatically when a procedure is complete and properly documented on the blockchain.
- **Fraud Protection:** Blockchain can publicly maintain a complete chain of custody for pharmaceuticals and medical supplies. This would allow buyers to reject counterfeit, stolen, or improperly maintained goods and make it easier to identify the responsible party when this occurs.


How does blockchain affect health care providers and IT leaders?

Most health systems will encounter blockchain as an underlying technology embedded in vendor-supplied IT solutions. While there is significant potential benefit for health care, there may not be enough to justify moving away from incumbent technologies that use more centralized or authority-based approaches. Interest in and experimentation with blockchain is increasing among health care organizations. Because blockchain remains a relatively immature technology, organizations should track the technology's development and consider implementing blockchain-based solutions that have the infrastructure and value potential to drive adoption at scale.

Questions That Hospital Executives Should Ask Themselves

- 1 What processes are we interested in improving through blockchain technology?
- 2 What third-party blockchain solutions have long-term viability? What is their deployed base and rate of adoption? Are there incentives for early adopters to participate?
- 3 Does my vendor have the appropriate experience, shared liability, and process controls in place to maintain the security of blockchain-based applications?



Additional Advisory Board research and support available



Report: [Blockchain: A Technical Foundation for Trust](#)



Web conference: [5 Things CEOs Need to Know About IT](#)