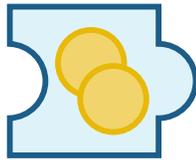


## How Blockchain Works

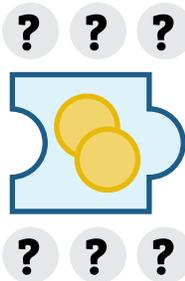
'A' wants to send money to 'B'



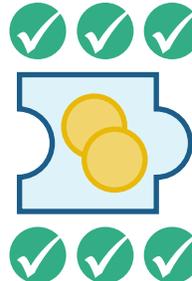
The transaction is represented online as a "block"



The block is broadcast to every party in the network



Those in the network approve the transaction is valid



The block is then added to the chain which provides a transparent record of transactions



The money moves from 'A' to 'B'



Source: World Economic Forum

## Blockchain Technology: An Emerging Public Policy Issue

BY HEATHER MORTON

In a [recent survey](#) on technology tipping points, the World Economic Forum estimates that 10 percent of global gross domestic product (GDP) will be stored on blockchain technology by 2027. And, the survey estimates that taxes will be collected for the first time by a government via blockchain by 2023.

Many people have heard of Bitcoin, a digital currency, but not as many are familiar with blockchain—the technology that allows digital currencies to be created, traded and tracked. Blockchain is a distributed ledger database that records and shares every transaction that occurs in the network of users.

In a traditional sales transaction, the buyer makes a purchase and the payment is marked in the buyer's financial ledger as a debit, while the seller marks the sale and payment as a credit in the seller's financial ledger. Each party involved in the transaction maintains its own ledger, following the double-entry bookkeeping system that developed

in 15th-century Venice. Each party spends valuable time to ensure that its ledgers remain accurate and the ledgers are usually privately held.

In a blockchain transaction, the buyer initiates the purchase, known as the block, which contains transaction data such as the date, time and payment amount. Both the buyer and seller can see the block of transaction data, so both parties can confirm that the payment was sent and received. Each transaction's block is created in a shared online accounting ledger that can involve multiple buyers and sellers within a network. As new transactions occur between the buyer and seller, each data block is recorded and forms the chain that documents the transaction history.

Unlike most double-entry bookkeeping records, the blockchain is visible to all parties within the network, creating a shared or distributed ledger. Each chain is encrypted so that no one can change the transaction data once it is recorded in the ledger. With one ledger used by everyone in the network, there is no need to maintain individual ledgers.

### Did You Know?

- Blockchain is a shared ledger database that records and shares every transaction that occurs in the network of users.
- The [World Economic Forum](#) estimates that taxes will be collected for the first time by a government via blockchain by 2023.
- Five states—Arizona, Delaware, Illinois, Nevada and Vermont—have enacted or adopted blockchain legislation.

**Digital currencies are only one way to use blockchain. Other evolving applications can include online voting, medical records, insurance policies, property and real estate records, copyrights and licenses, and supply chain tracking.**

Digital currencies are only one way to use blockchain. Other evolving applications can include online voting, medical records, insurance policies, property and real estate records, copyrights and licenses, and supply chain tracking. They can also include smart contracts, where payouts between the contracted parties are embedded in the blockchain and automatically execute when contractual conditions have been met.

Developers of the distributed ledger technology believe that blockchain leads to increased trust and reduced fraud because every transaction block is visible to everyone in the network. In addition, with fewer ledger systems to maintain, blockchain can lead to lower transaction costs and faster processing times because third parties are not required to verify and process the payments.

While blockchain has the potential to be a game-changer in how financial and other transactions are conducted, some are concerned about the costs required to develop and run blockchain. As these other applications evolve, developers will need to set blockchain technological standards, as a lack of standards could impede interoperability, and policymakers may need to amend legal and regulatory frameworks to recognize blockchain transactions.

## State Action

**Vermont** became the first state to address blockchain in legislation in 2015, when it directed the attorney general, Department of Financial Regulation, and secretary of state to report to the General Assembly on opportunities and risks of creating a presumption of validity for electronic facts and records that employ blockchain technology. Then, in 2016, the Vermont General Assembly created the evidentiary standards to determine the authenticity of records using blockchain technology within the state's rules of evidence.

In 2017, four states—Arizona, Delaware, Illinois and Nevada—enacted or adopted blockchain legislation. Arizona enacted two bills. The first, **H.B. 2417**, established guidelines for electronic signa-

tures and records using blockchain technology. In the second bill, **H.B. 2216**, the Legislature made it unlawful to require a person to use or be subject to electronic firearm tracking technology, including blockchain and distributed ledger systems. Delaware enacted **S.B. 69**, providing statutory authority for corporations formed in Delaware to use blockchain to create and maintain corporate records, including the corporation's stock ledger.

Following the formation of the **Illinois Blockchain Initiative**—a consortium of Illinois state and county agencies including the departments of Commerce and Economic Opportunity, Insurance, Financial and Professional Regulation, Innovation and Technology, and the Cooks County Recorder of Deeds—the Illinois General Assembly adopted a **joint resolution**. The resolution created the Illinois Legislative Blockchain and Distributed Ledger Task Force to study how and if the state, county and municipal governments can benefit from a blockchain-based system for recordkeeping and service delivery.

Nevada enacted **legislation** recognizing blockchain technology as a type of electronic record for the purposes of the Uniform Electronic Transactions Act and prohibited local governments from taxing or imposing restrictions on the use of blockchain.

## Federal Action

Federal agencies are evaluating distributed ledger technologies like blockchain to improve transparency, efficiency and trust in government information sharing. The U.S. Government Services Administration's (GSA) Emerging Citizen Technology program recently launched the U.S. Federal Blockchain program for federal agencies and U.S. businesses interested in exploring using distributed ledger technology within government. The GSA hosted the first U.S. Federal Blockchain Forum in July 2017, bringing together more than 100 federal managers from dozens of unique agencies to discuss use cases, limitations and possible solutions.

## Additional Resources

National Association of State Chief Information Officers, [Blockchains: Moving Digital Government Forward in the States](#)

World Economic Forum, [Technology Tipping Points and Societal Impacts](#)

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