

**CPIM**

CENTER FOR PUBLIC INVESTMENT MANAGEMENT



A PROGRAM BROUGHT TO YOU BY:

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# The Future of Blockchain

# Blockchain technology is NOT cryptocurrency

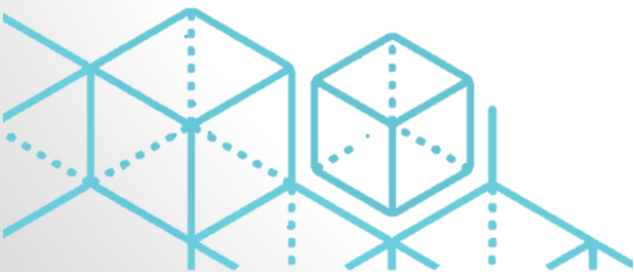
Blockchain is electronic *distributed ledger technology (DLT)*



Bitcoin, or cryptocurrency, is a digital asset

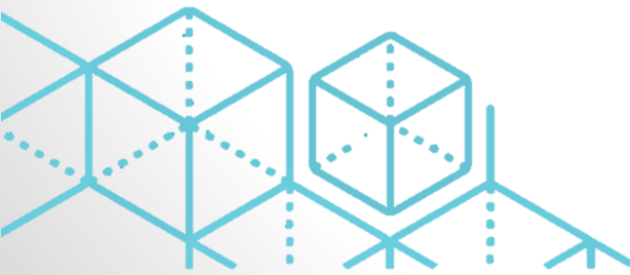
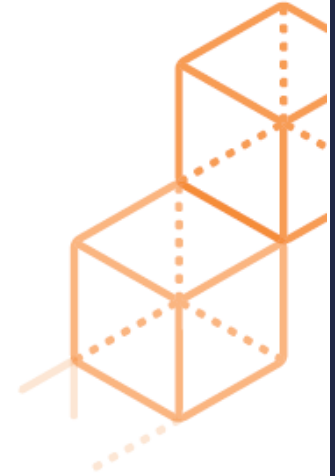


Blockchain is a distributed ledger application



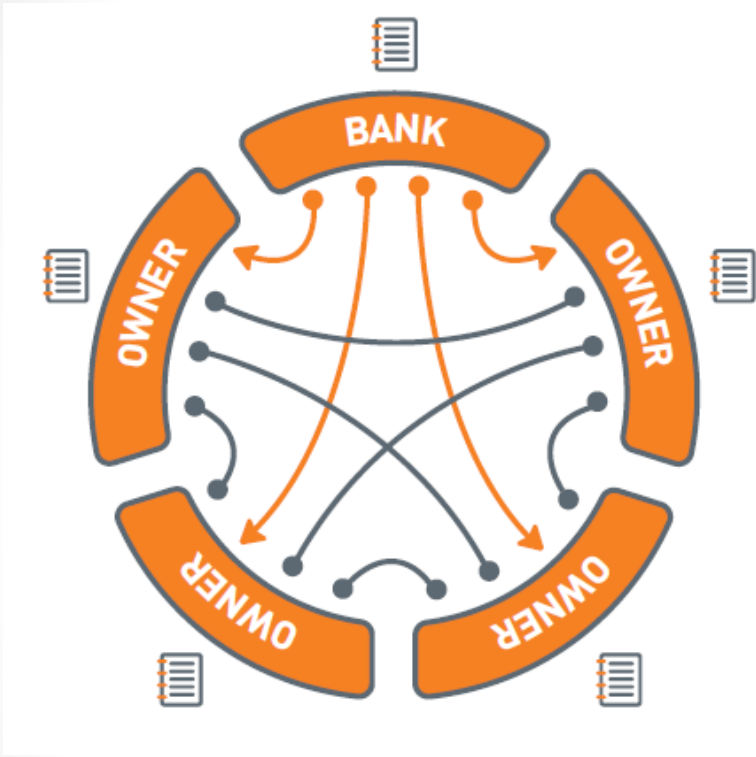
# What is a blockchain?

- A blockchain is a form of a **decentralized, digital ledger** where a record of each event or transaction can be shared simultaneously across a network of computers to every participant.
- Each **participant in the network has an identical copy of the ledger** to which they can add encrypted transactions, and, because it is decentralized, all participants are able to validate transactions while **no longer having to rely on a single central authority**.
- The end result is a **highly efficient** and **secure** method of performing transactions.



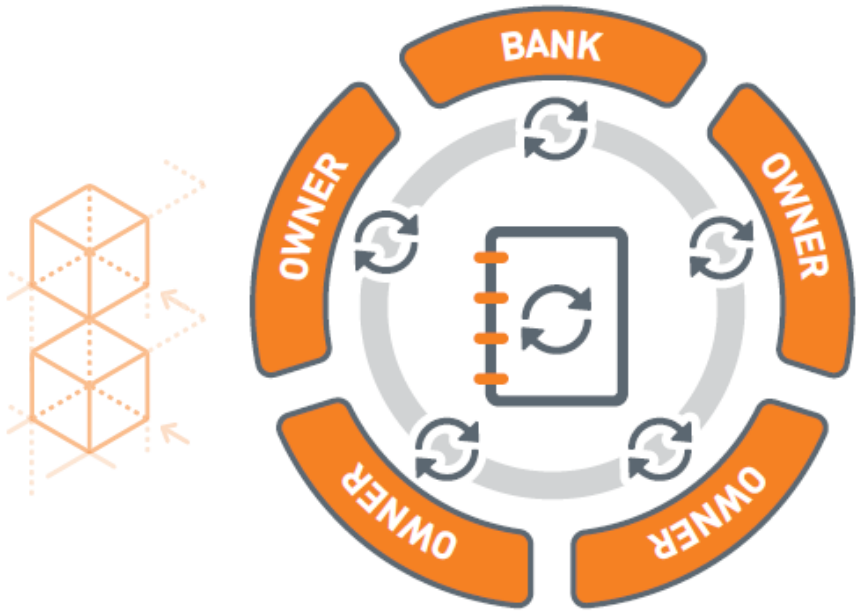
# Traditional Versus Blockchain

## TRADITIONAL SYSTEMS



Transactions are recorded in multiple ledgers, each held by a single party, reflecting one moment in time.

## BLOCKCHAIN



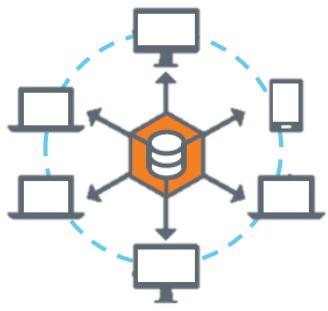
Transactions are shared and updated in near-real time by a group of participants.

*The chart illustrates one of the many process flows and applications of this technology.*

# How Does it Work?



Transaction is requested



Request is sent to a network of computers (nodes)



The nodes validate the transaction and the user



The transaction is combined with other data to create a new block of data that can't be altered



The block is added to the existing blockchain



Transaction is complete

# A distributed ledger network can be public or private

Private networks are likely to be necessary for highly regulated business

	Public Network	Private Network
Description	<ul style="list-style-type: none"><li>• Fully decentralized, public access; permission-less (e.g. Bitcoin)</li><li>• All participants see everything</li></ul>	<ul style="list-style-type: none"><li>• Controlled, known network of participants; permissioned</li><li>• Access, visibility governed by network</li></ul>
Benefits	<ul style="list-style-type: none"><li>• Lower cost of entry, open source platform</li><li>• Truly decentralized and open</li><li>• Network effect benefits</li></ul>	<ul style="list-style-type: none"><li>• Control over participants</li><li>• Greater transaction speeds</li><li>• Enhanced privacy</li></ul>
Challenges	<ul style="list-style-type: none"><li>• Transactional inefficiency, throughput concerns</li><li>• Scalability issues</li><li>• Potential regulatory concerns over anonymity, privacy protection</li></ul>	<ul style="list-style-type: none"><li>• Higher cost to develop</li><li>• Interoperability with other platforms</li><li>• Alignment of participants relative to standards, operational rules</li></ul>

# Unlocking the Full Power of Blockchain

Characteristics that make blockchain a transformative technology



## DISTRIBUTED NETWORK

Leverages a distributed network of computers sharing and “hosting” the exact history of activity, transaction data



## SINGLE SOURCE OF TRUTH

Provides a single, consistent and shared view of the state of a business process



## PROVENANCE

Establishes provenance, or a record of an entire transaction, workflow



## SECURITY/ PRIVACY

Enhances security and privacy through encryption



## IMMUTABLE RECORD

No one has unilateral power to edit transactions

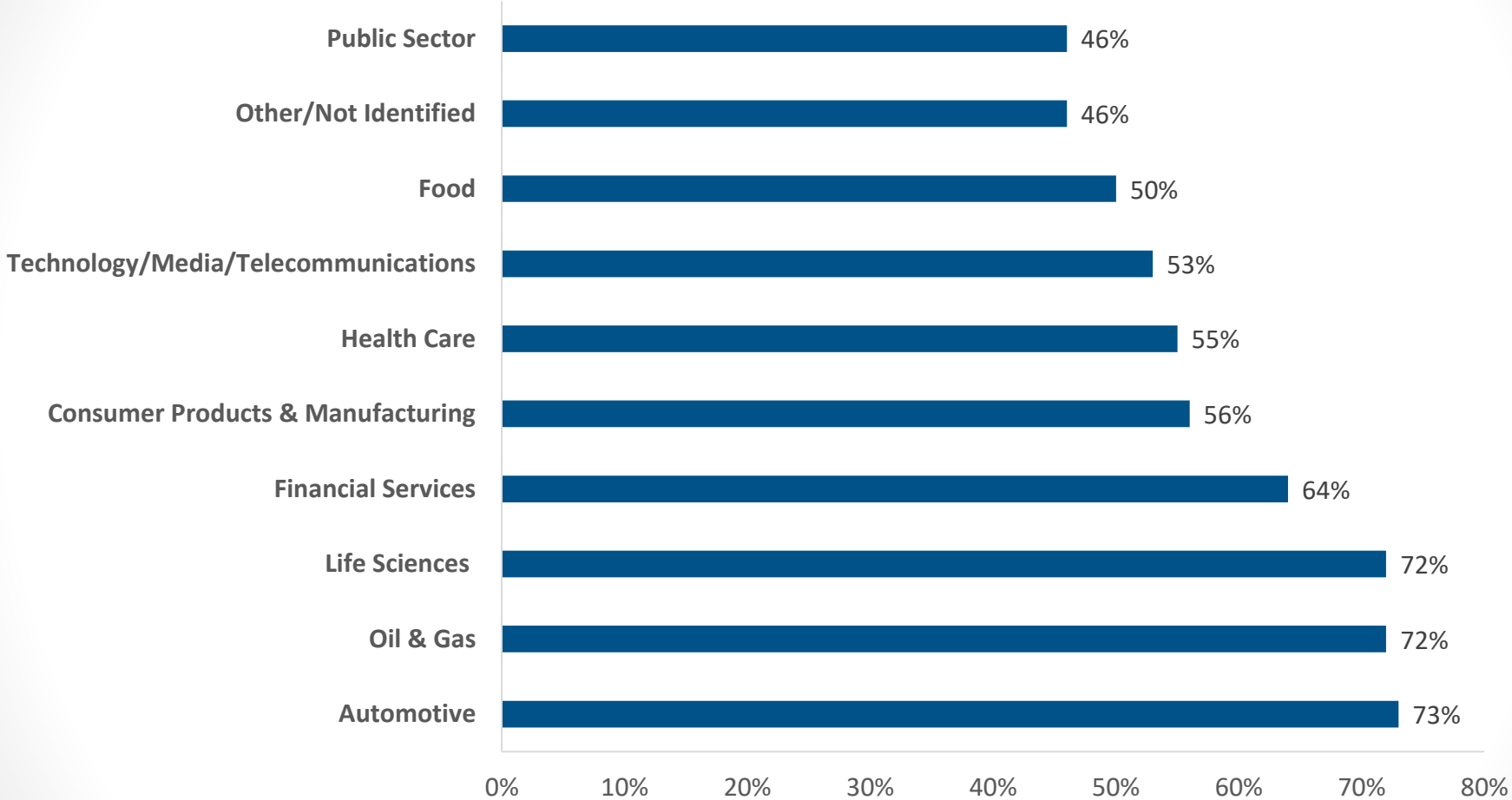


## “SMART” CONTRACTS

Automate transaction execution and integrate workflows






# Blockchain is expected to disrupt industries

Industries to be most disrupted – 2018 Deloitte survey of BC experts





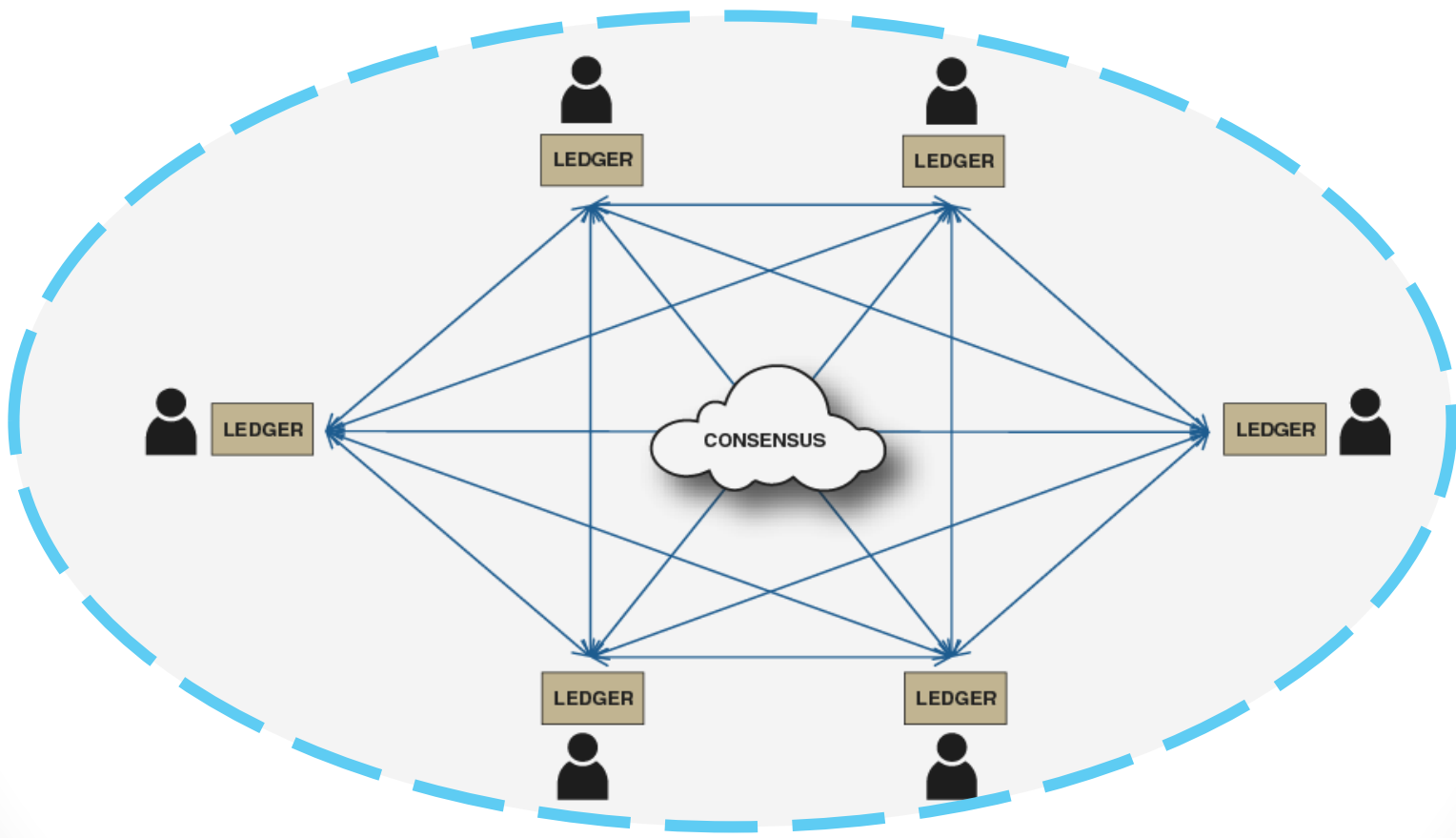
# Sample of active blockchains with smart contracts

	<p>International cross-border payments</p>	<p>Production</p>
	<p>Trade and shipping supply chain</p>	<p>Production</p>
	<p>Food traceability farm to table</p>	<p>Production</p>
	<p>Property &amp; Casualty insurance consortium</p>	<p>Test</p>
	<p>Securities trading and settlement for the Australian Securities Exchange</p>	<p>Fall 2019</p>

# Blockchain requires a *NETWORK*, likely co-opetition

Even the best designed blockchain solutions will fail without a network

## Network Ecosystem



• <https://www.chicagofed.org/publications/economic-perspectives/2017/7>