

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

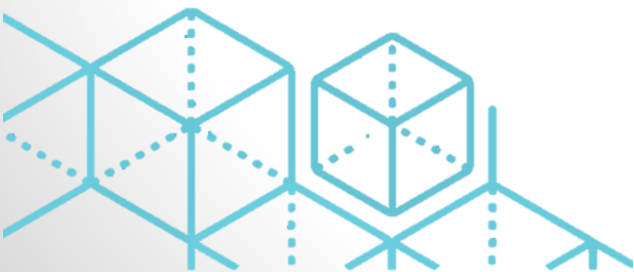
Blockchain is electronic *distributed ledger technology (DLT)*



Bitcoin, or cryptocurrency, is a digital asset

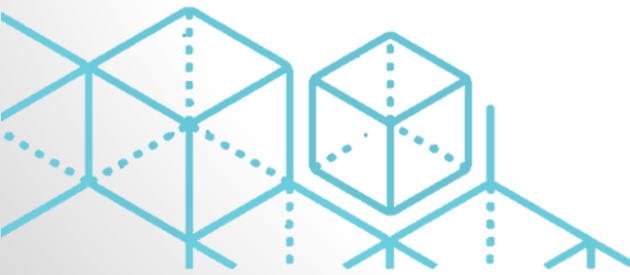
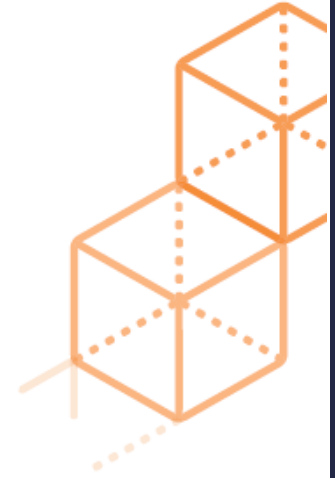


Blockchain is a distributed ledger application



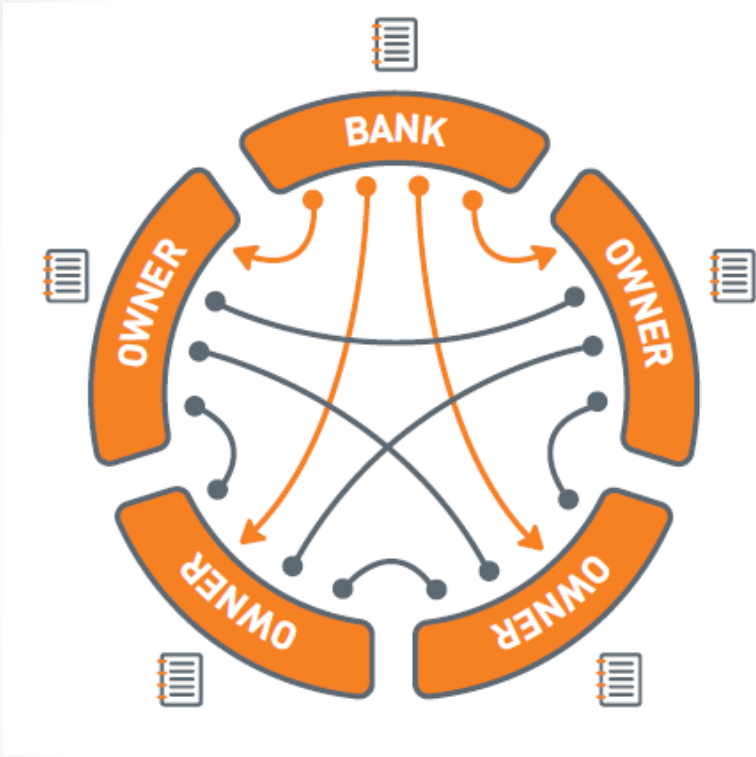
What is a blockchain?

- 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



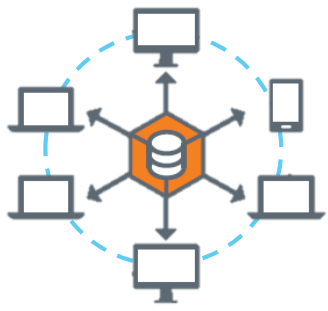
Transactions are shared and updated in near-real time by a group of participants.

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

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

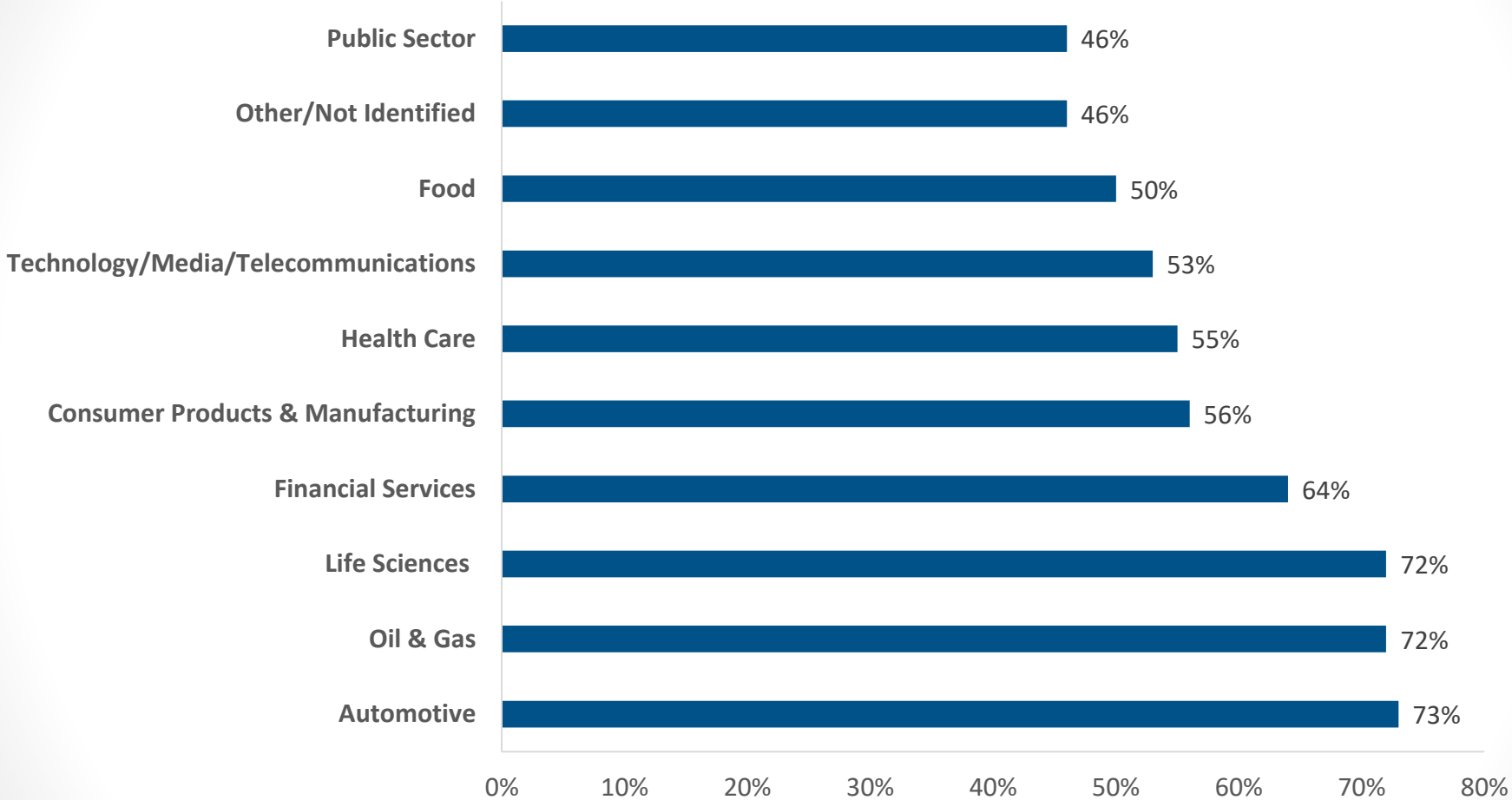


“SMART” CONTRACTS






Automate transaction execution and integrate workflows

Blockchain is expected to disrupt industries

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



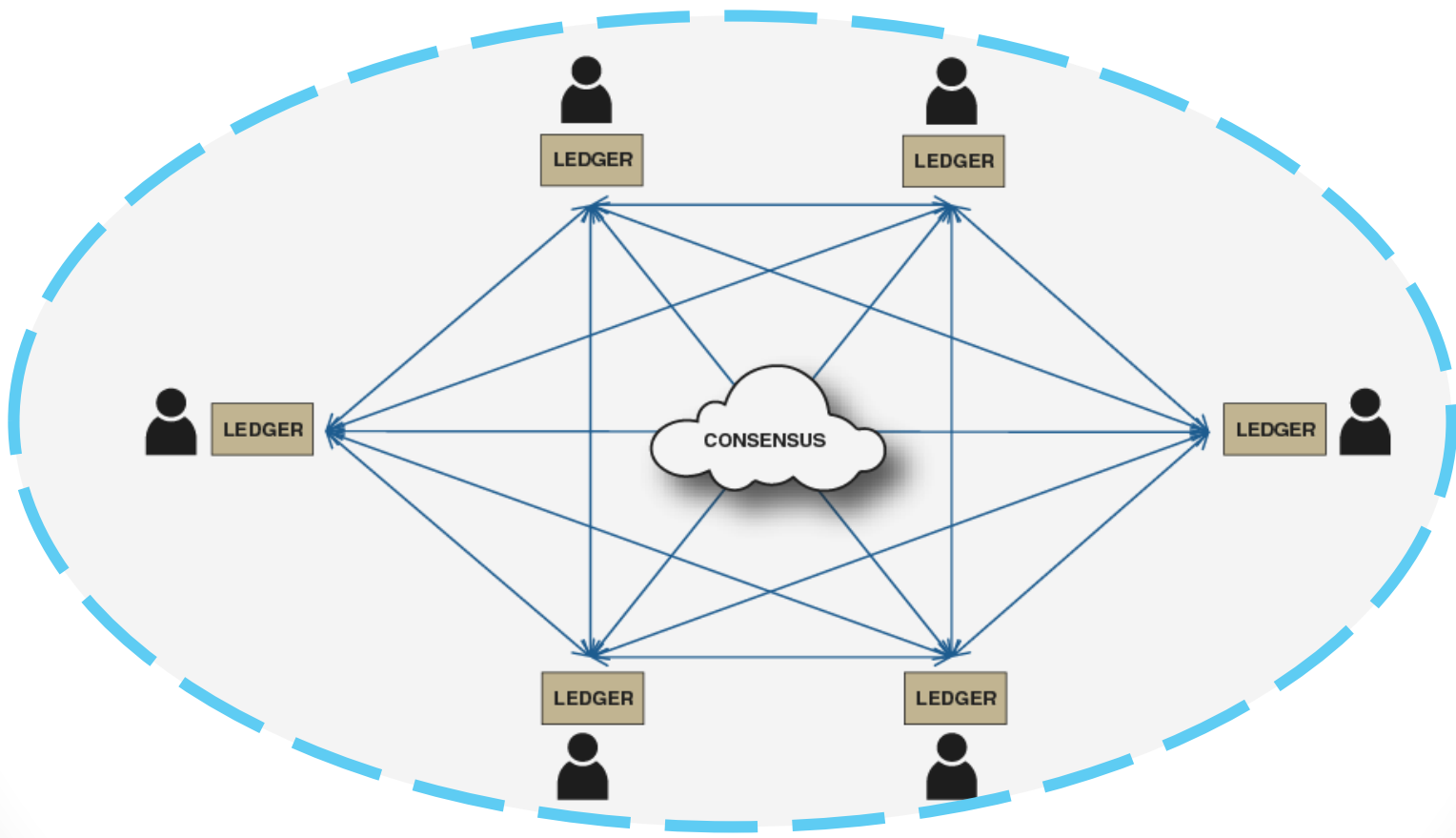
Sample of active blockchains with smart contracts

	<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 & 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>