CPIM

CENTER FOR PUBLIC INVESTMENT MANAGEMENT

A PROGRAM BROUGHT TO YOU BY:

ROBERT SPRAGUE

OHIO TREASURER

The Future of Blockchain

Blockchain technology is NOT cryptocurrency

Blockchain is electronic *distributed ledger technology (DLT)*

Bitcoin, or cryptocurrency, is a digital asset

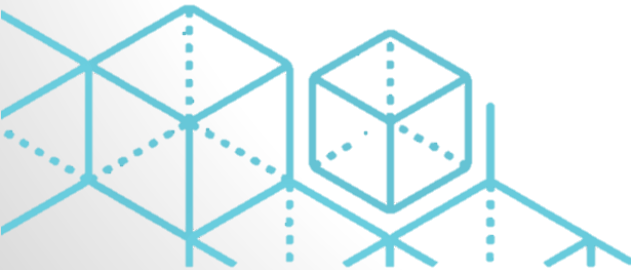
Blockchain is a distributed ledger application

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.

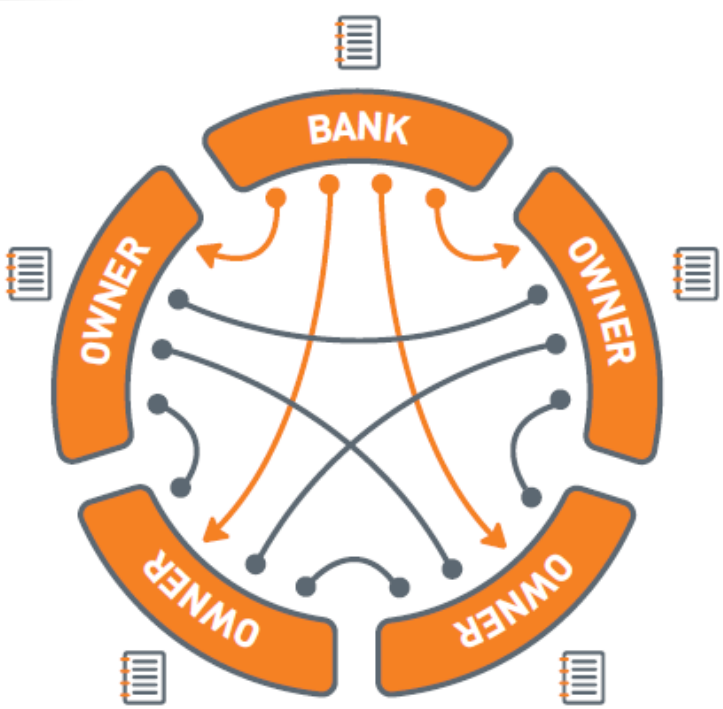
- Each **participant in the network has an identical copy of the ledger** to which they can add encrypted transactions, and, because it is decentralized, all participants are able to validate transactions while **no longer having to rely on a single central authority.**

- The end result is a **highly efficient** and **secure** method of performing transactions.



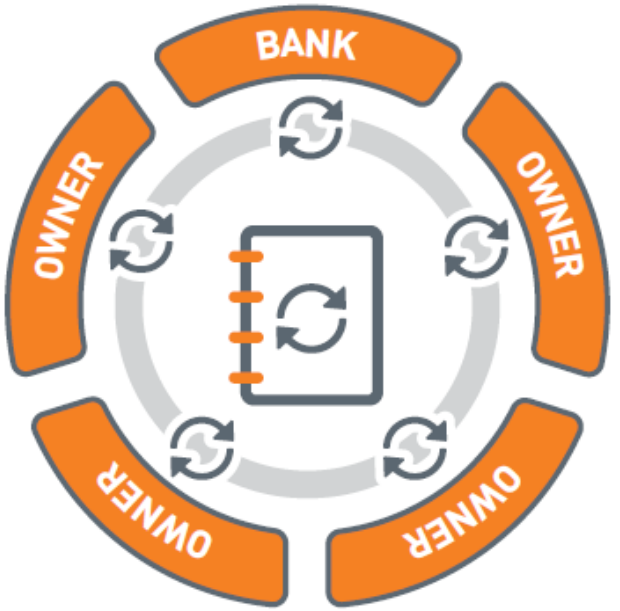
Traditional Versus Blockchain

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	• Fully decentralized, public access; permission-less (e.g. Bitcoin) • All participants see everything	• Controlled, known network of participants; permissioned • Access, visibility governed by network
Benefits	• Lower cost of entry, open source platform • Truly decentralized and open • Network effect benefits	• Control over participants • Greater transaction speeds • Enhanced privacy
Challenges	• Transactional inefficiency, throughput concerns • Scalability issues • Potential regulatory concerns over anonymity, privacy protection	• 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

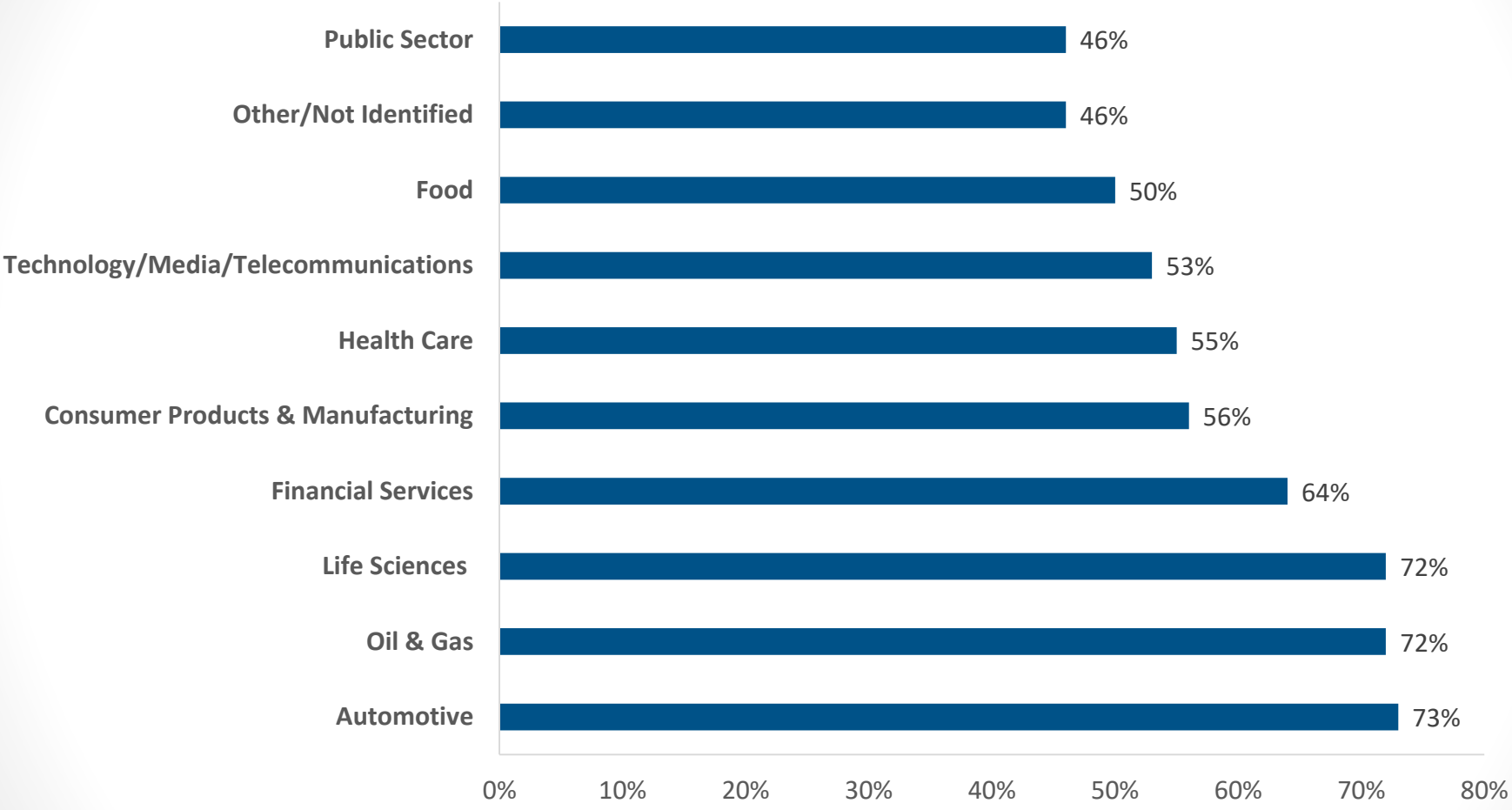
No one has unilateral power to edit transactions

"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



Deloitte's 2018 global blockchain survey | Findings and insights

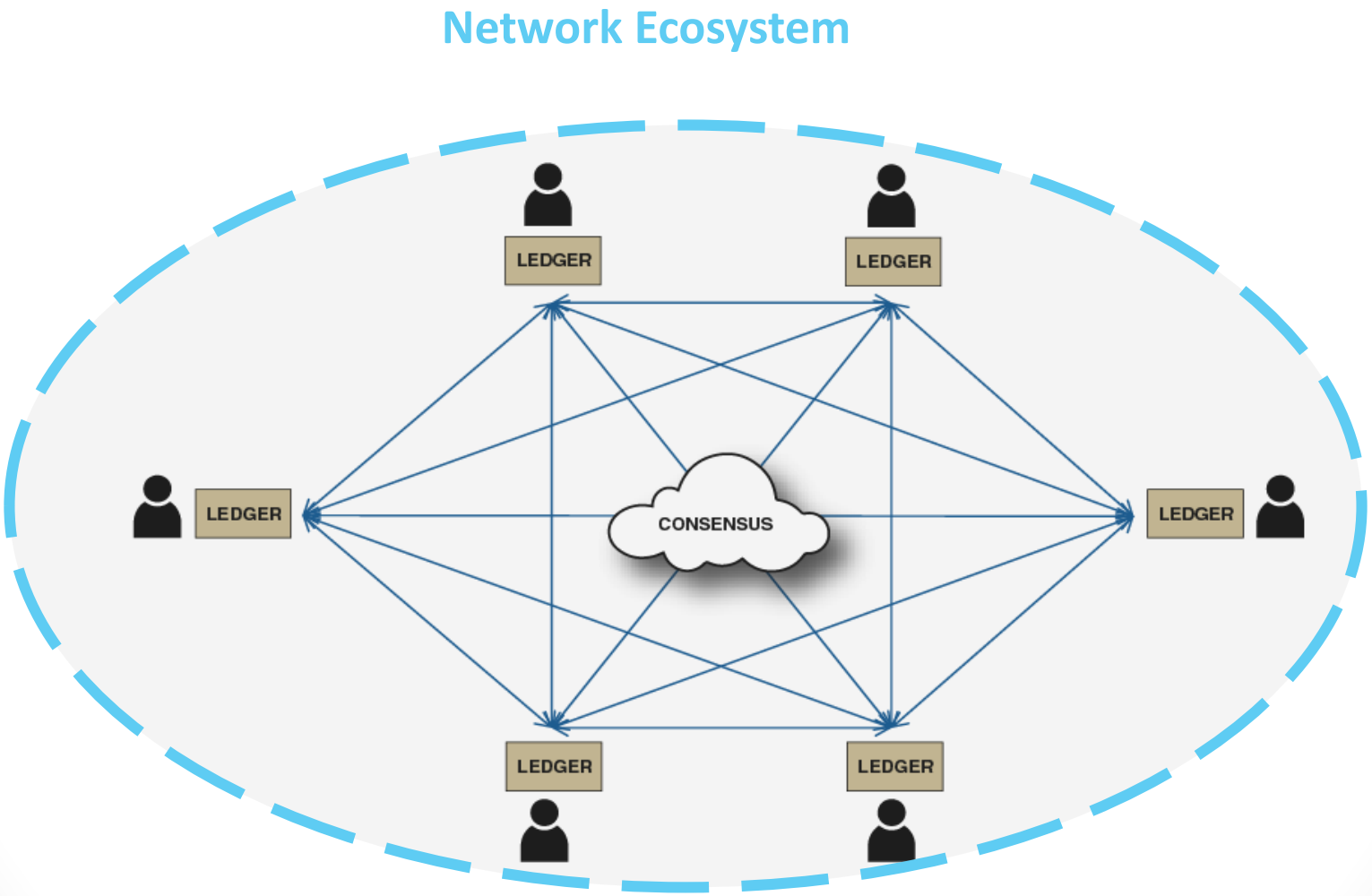
Survey conducted March –April 2018'

Sample of active blockchains with smart contracts

ripple	International cross-border payments	Production
MAERSK IBM	Trade and shipping supply chain	Production
Walmart PERDUE	Food traceability farm to table	Production
B3i	Property & Casualty insurance consortium	Test
ASX Digital Asset	Securities trading and settlement for the Australian Securities Exchange	Fall 2019

Blockchain requires a *NETWORK*, likely co-opetition

Even the best designed blockchain solutions will fail without a network



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