AGENDA

What is Blockchain?

How Blockchain Works?

Blockchain Benefits

Why is Blockchain relevant to Business?

Blockchain Disrupting Industries

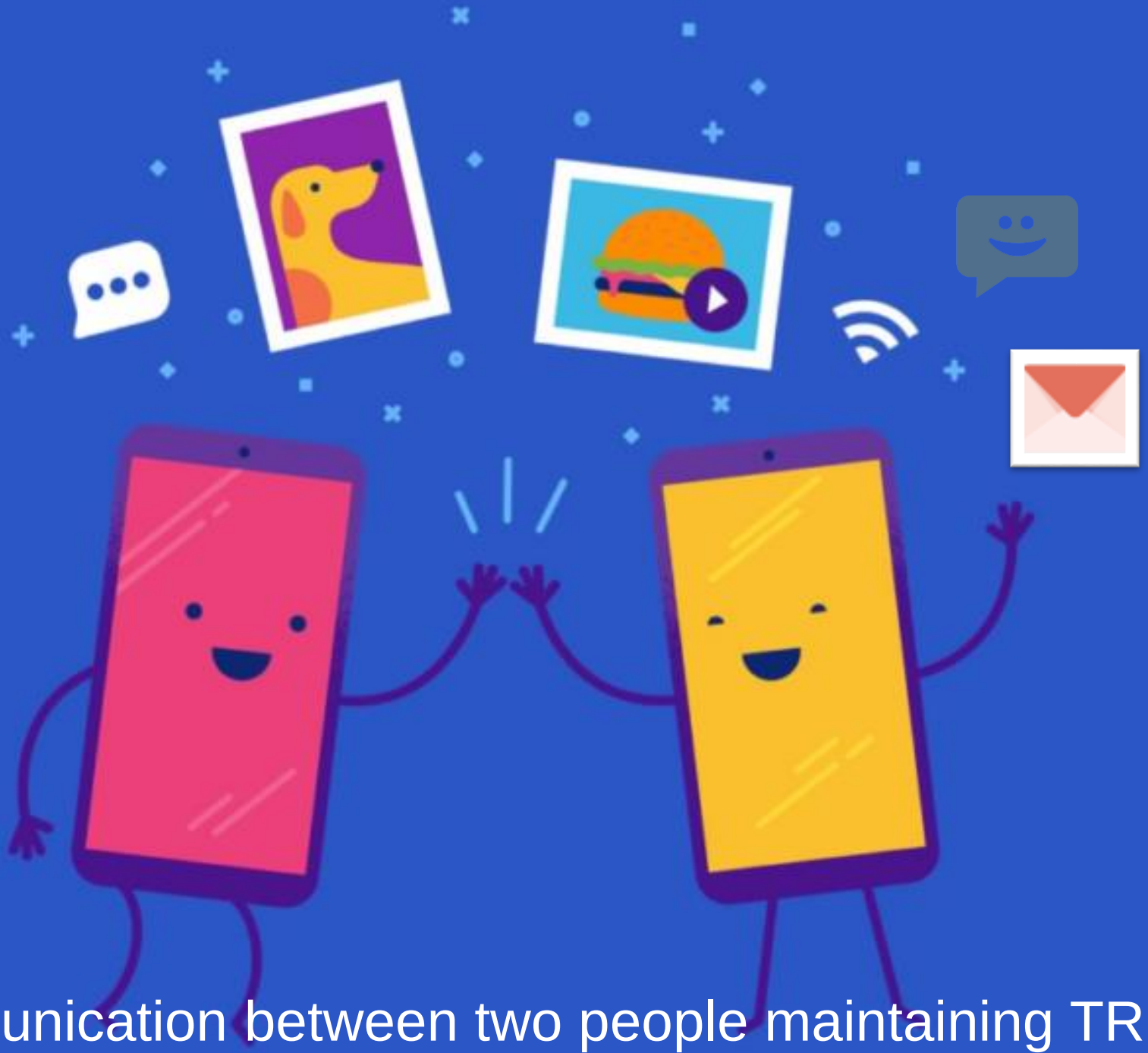
Community Driven Blockchain Stack

Q&A

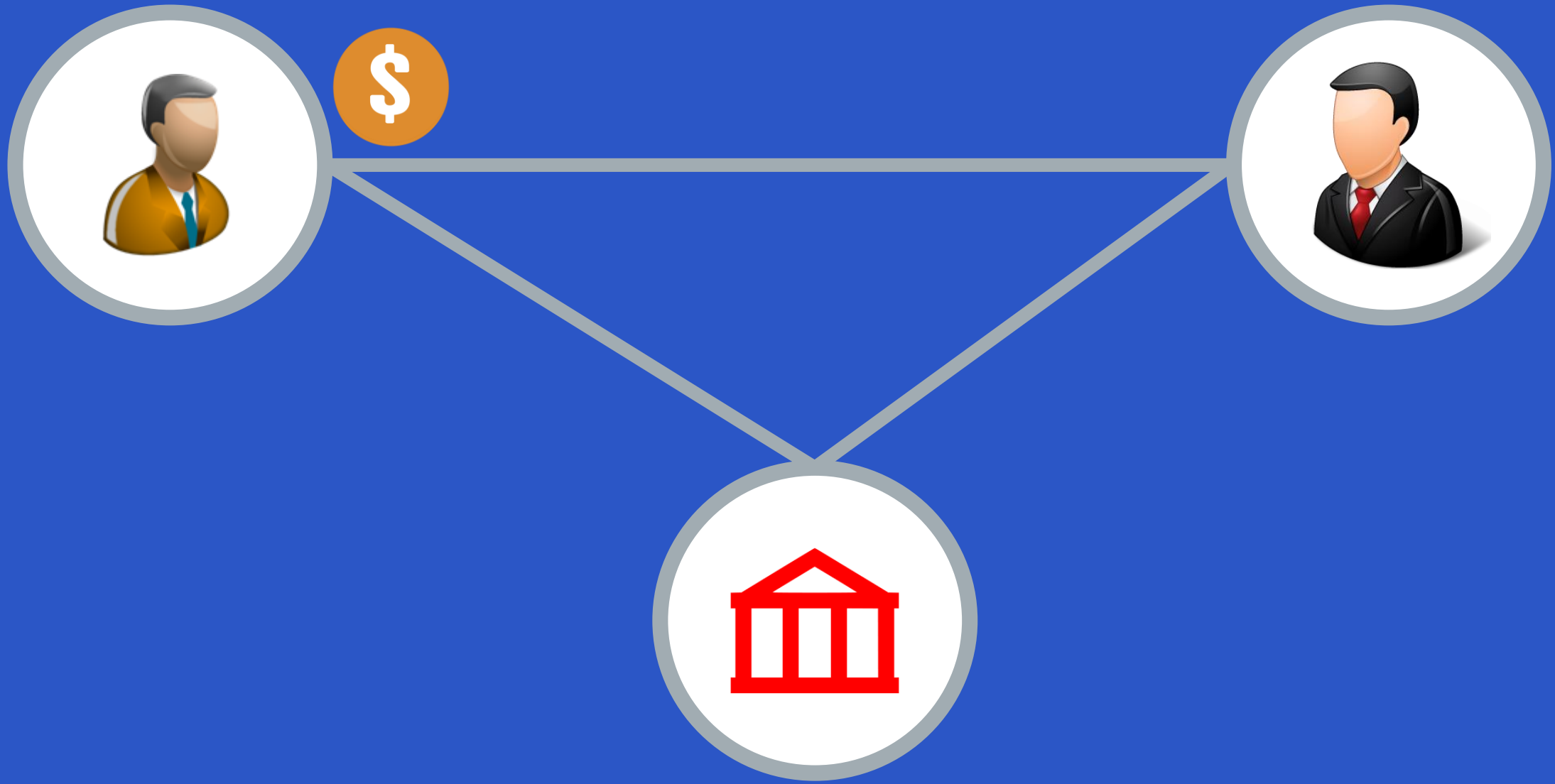
Blockchain is

NOT

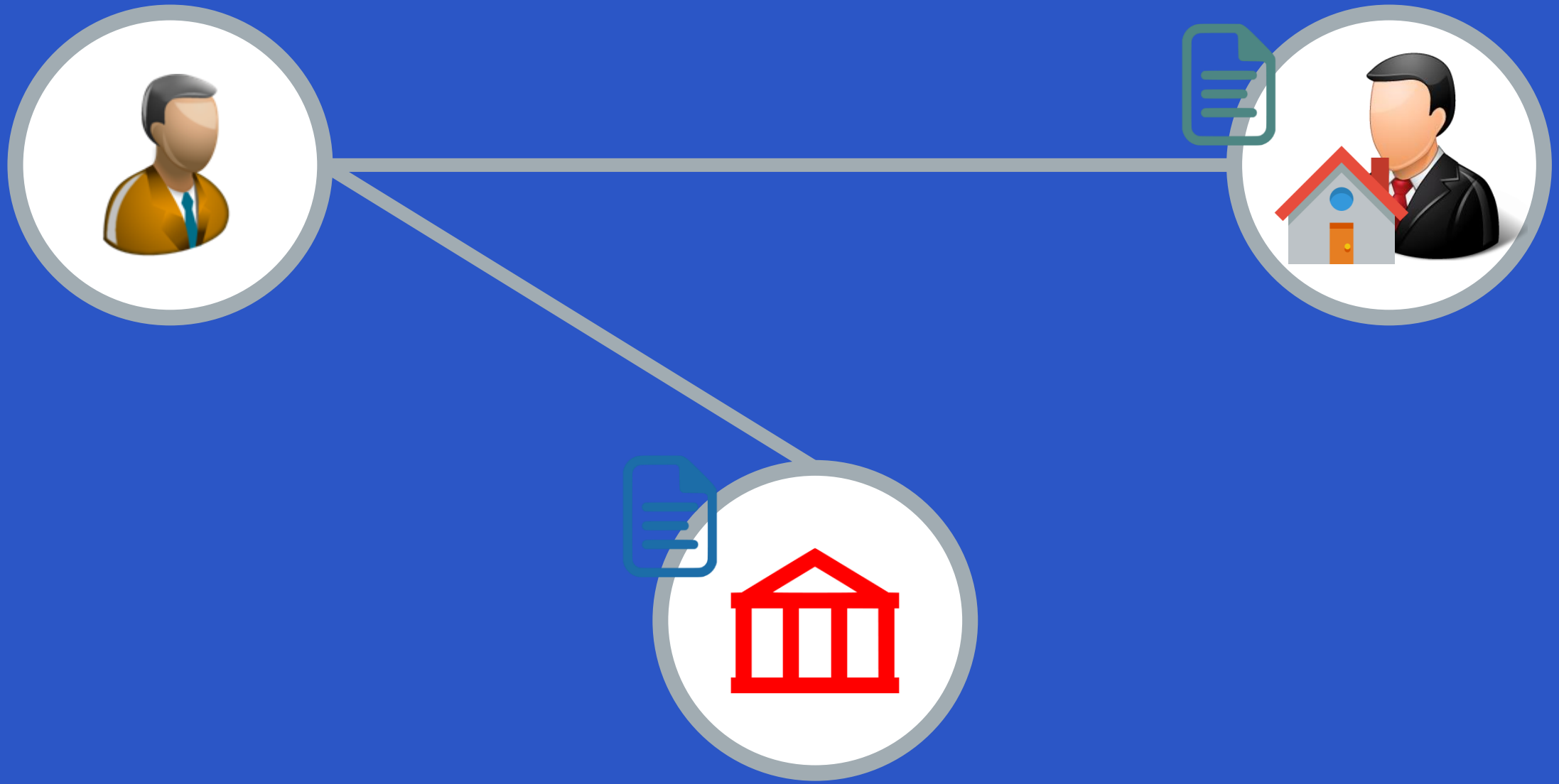
a Cryptocurrency



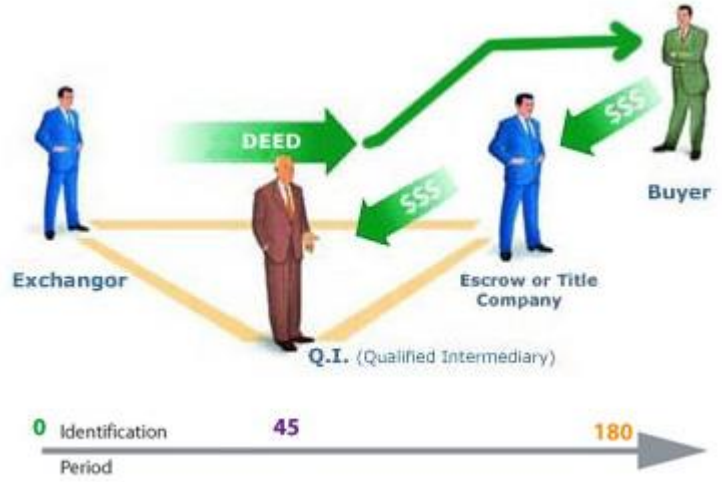
Communication between two people maintaining TRUST



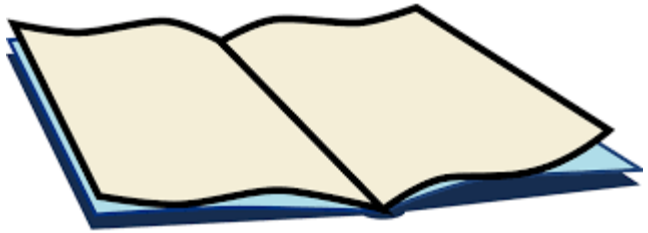
Most of the transactions happens through Centralized Authorities



Lots of scope for Data Inconsistency



Trusted Intermediary



No Open Ledger

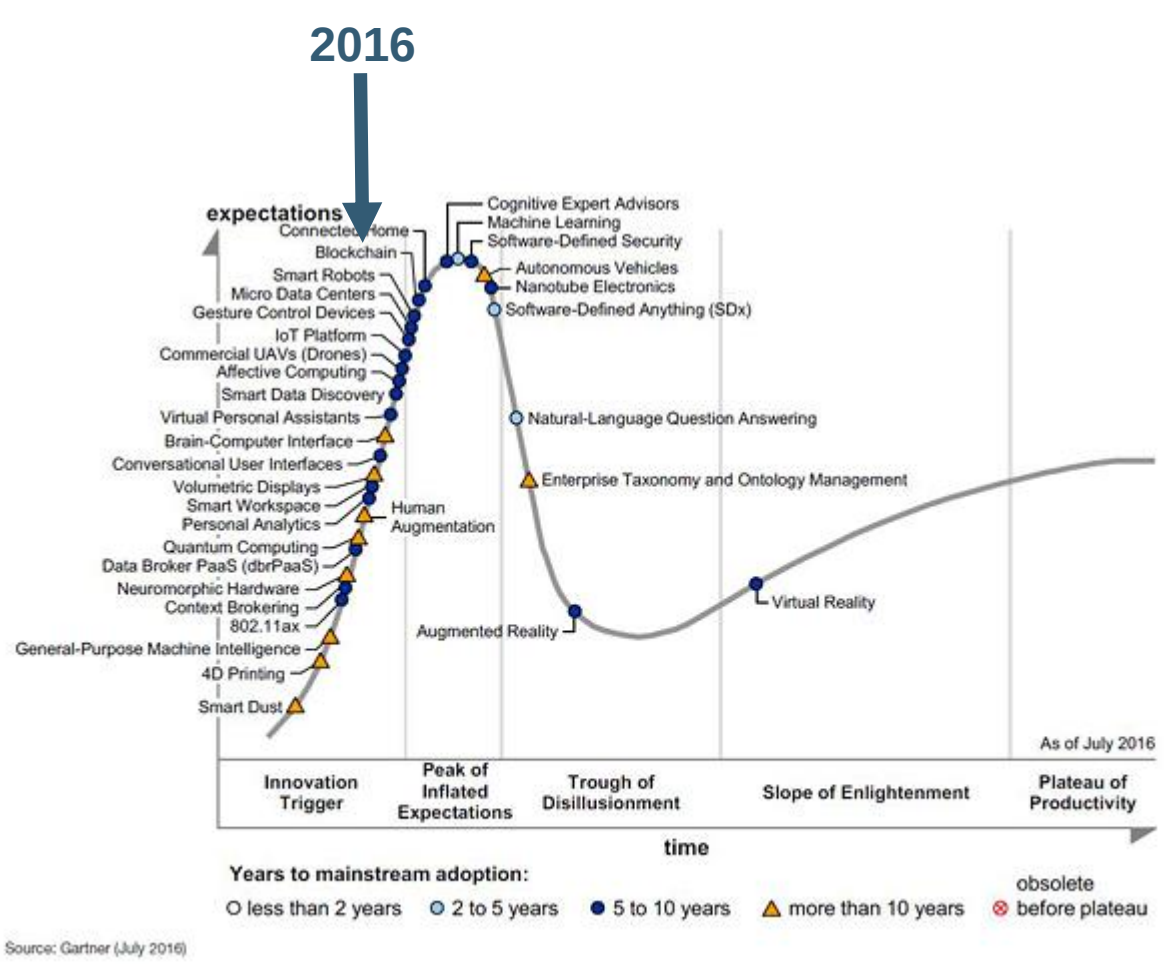
&

No Tamper Proof

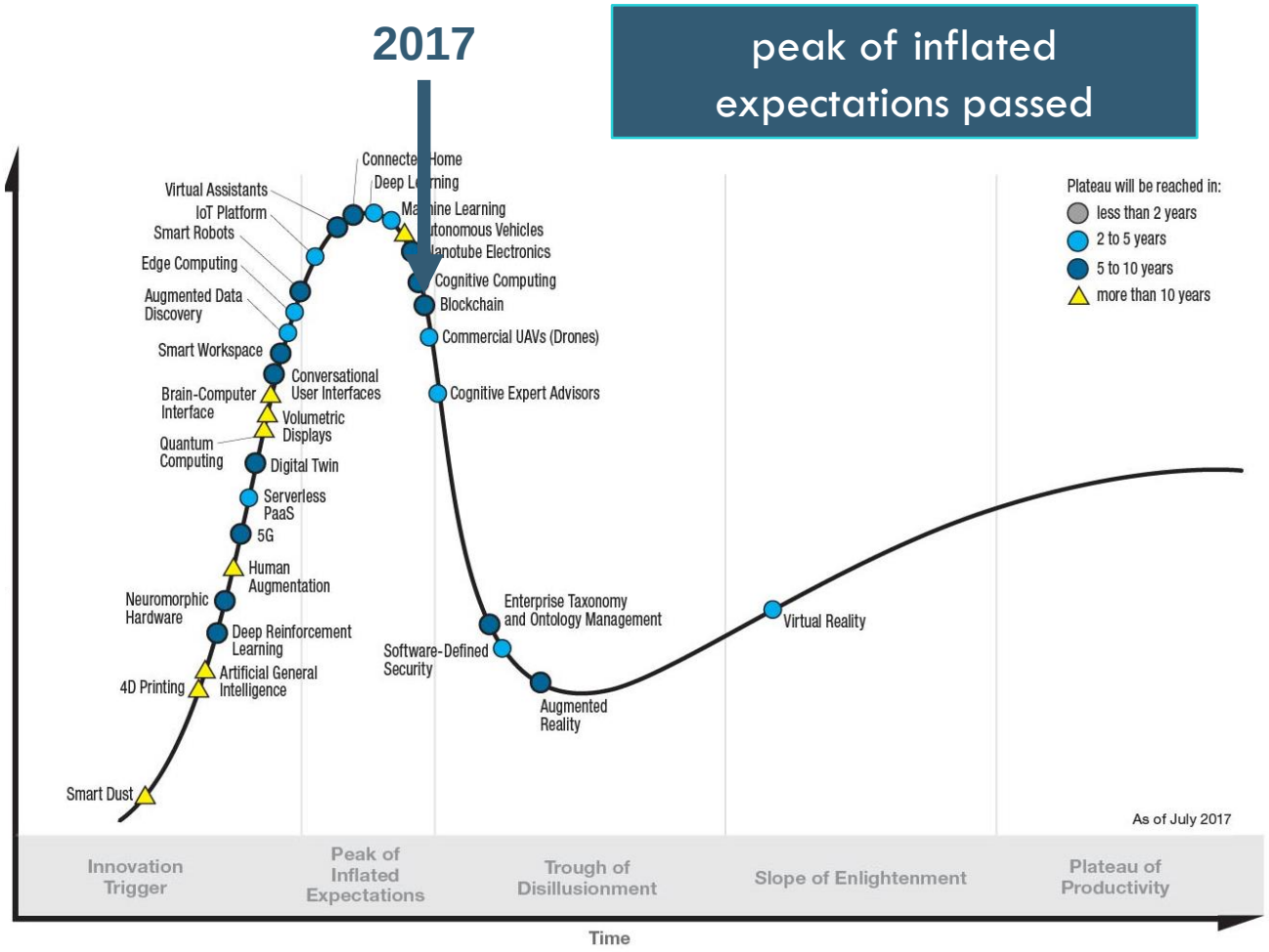
WHAT IS BLOCKCHAIN?

“Blockchain is a public and open shared distributed ledger to enable the trust & secured transactions across the participants without any intermediator trusted parties”

BLOCKCHAIN ENTERS TROUGH OF DISILLUSIONMENT



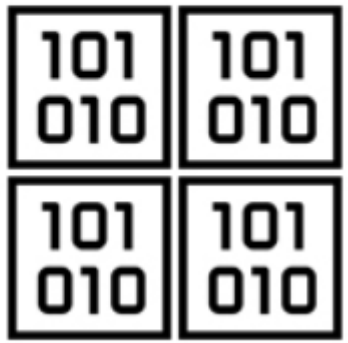
Source: Gartner (July 2016)



How Blockchain Works

STEP 1 | New transactions are broadcast to all nodes.

STEP 2 | Each node collects new transactions into a block.

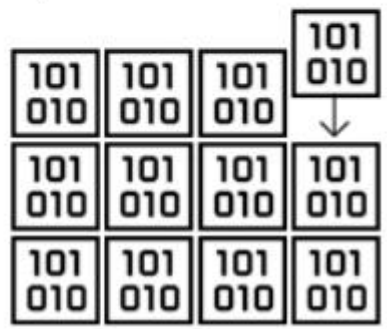


STEP 3 | Each node works on finding a difficult proof-of-work for its block.

STEP 4 | When a node finds a proof-of-work, it broadcasts the block to all nodes.

STEP 5 | Nodes accept the block only if all transactions in it are valid and not already spent.

STEP 6 | Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.



Hashing Demo

BLOCKCHAIN BENEFITS

Saves
time

Transaction time from days to near instantaneous

Removes
cost

Overheads and cost intermediaries

Reduces
risk

Tampering, fraud & cyber crime

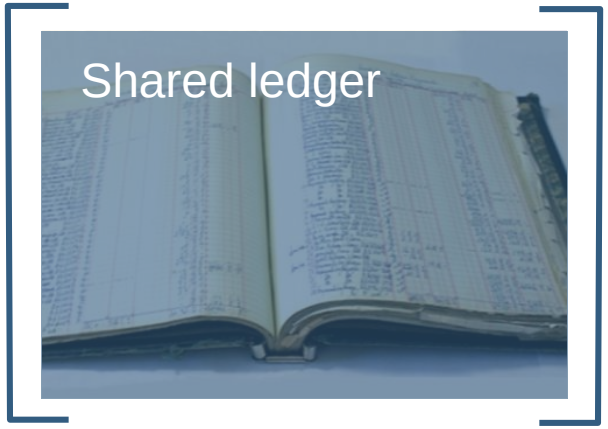
Increases
trust

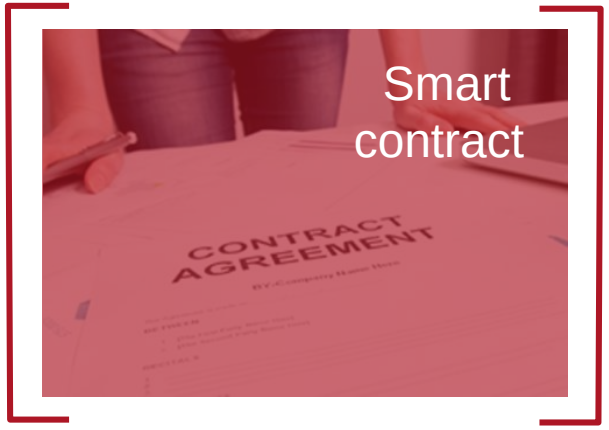
Through shared processes and recordkeeping

BLOCKCHAIN FOR BUSINESS

A shared ledger technology allowing any participant in the business network to see THE system of record (ledger)…

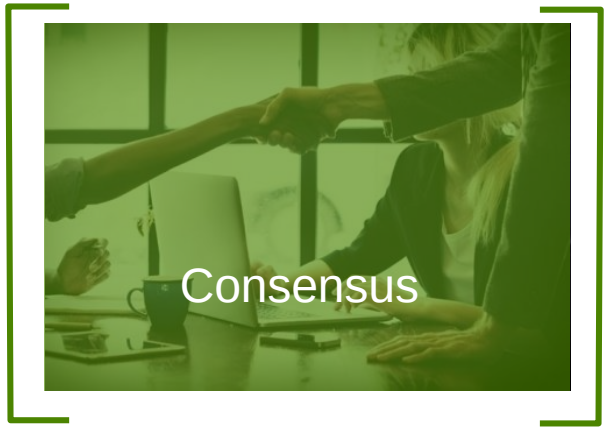
Append-only distributed system of record shared across business network





Business terms embedded in transaction database & executed with transactions

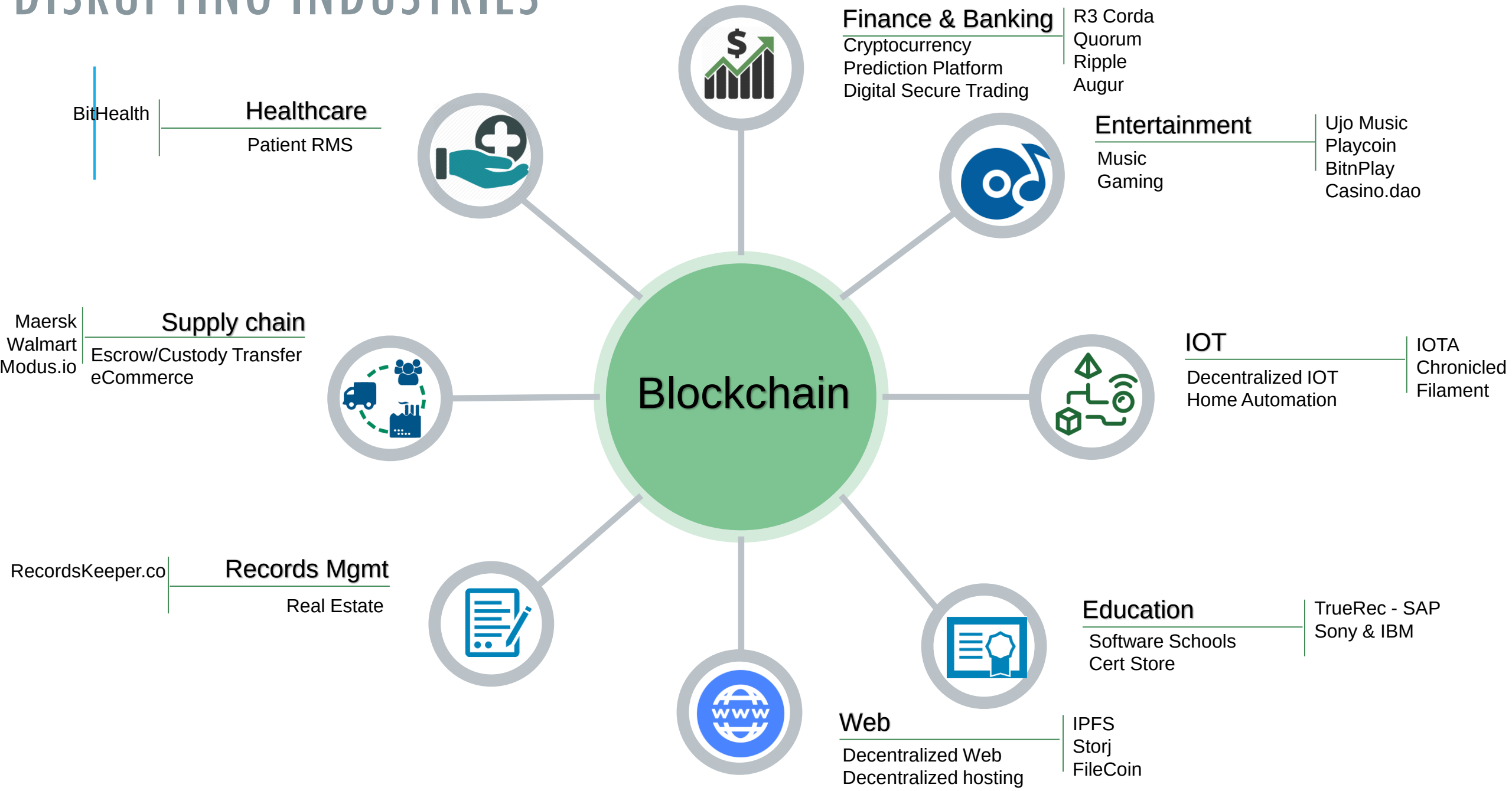
Ensuring appropriate visibility; transactions are secure, authenticated & verifiable



All parties agree to network verified transaction

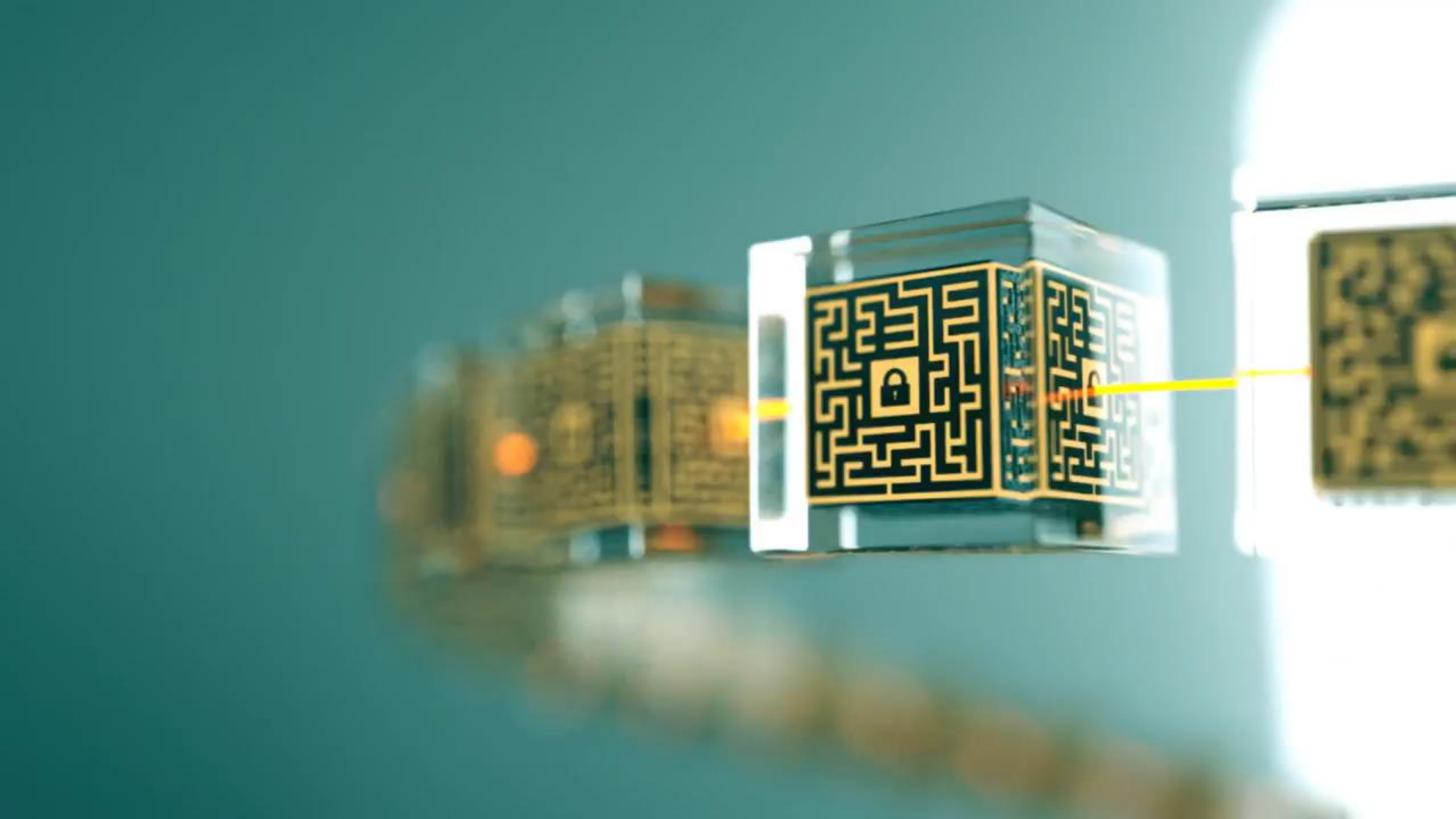
… Broader participation, lower cost, increased efficiency

DISRUPTING INDUSTRIES



Internet of Things

Supply chain Industry



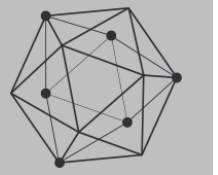
PUBLIC VS PERMISSIONED BLOCKCHAIN

	Permissionless / Public	Permissioned / Private
Access	Open read/write access to database	Permissioned read and/or write access to database
Identity	Anonymous	Known Identities
Security	Based on consensus algorithm (POW/POS)	Pre-approved participants
Speed	Slower	Faster
Storage	Massively Distributed	Central & Hybrid Servers
Asset	Native Assets	Known Assets
Privacy	Public	Same as traditional systems
Transaction Fee	Required	Free (Based on Network Owner)
Immutability	Secured by hashing Algo	Secured by distributed consensus
Examples	Bitcoin, Ethereum	Hyperledger, Ethereum, Ripple, Blockstream, Multichain

BLOCKCHAIN VS DATABASE

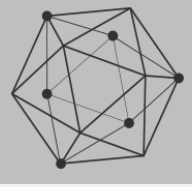
	Blockchain	Database (Traditional / Distributed)
Data Ownership	Cryptography based algorithms and Public-Private key pair based account controls	Centralized Account Control
Privacy and Security	Distributed and Decentralized Cryptographic Authentication	Controlled by a Central Authority based on established governing rules and process controls
Access Control	Every node has the synchronized ability to control access based on private-public key pairs	Controlled by a central Authority
Data Quality	Immutable records and data insertion after mutually approved by using consensus algorithms	Manual intervention is required for validating the data and resolve conflicts
Data Immutability	inbuilt	Very complex and centrally controlled
Concurrency and Synchronization	All nodes are exact replicas supported by Consensus algorithms	Involves complex configurations and mirroring techniques
Data Storage	Data size and number of copies of data is multiplies by number of nodes in the networks.	Has to be planned and configured manually
Low Latency	Very slow, ~10-15 transactions per second	Faster to near real time, Thousands of transactions per second
Querying	Not Capable of Querying, Need to go through entire Data Structure	Highly Queryable with the support of indexing and some other performance improvements

ETHEREUM VS HYPERLEDGER

	Ethereum 	Hyperledger 
Network	Public or Permissioned	Permissioned
Transactions	Anonymous or Private	Public or Confidential
Smart Contracts (Business Logic)	Solidity (Single Language)	Chaincode (Supports Polyglot programming)
Sandbox Execution	EVM	Java or Go code converts to chaincode for remote execution in Docker containers of validating peer nodes
Consensus	POW / Ethash POS (Will be available in next releases)	PBFT
Storage Model	Level DB (Data Structures like Lists, Structs, Maps etc in Smart Contracts)	Rocks DB (Allows for a table of data with Primary Key lookup)
Block Limit	No Limit (Block contains multiple transactions and block size is configurable in genesis file)	Unlimited (Every Transaction is treated as a Block)

Note: Ethereum is available in Microsoft Azure

ETHEREUM VS HYPERLEDGER CONTINUATION

	Ethereum 	Hyperledger 
Cryptocurrency (Required)	Ether or Custom Tokens	None
Mining (Required/Rewarded)	Yes	No
Languages Supported	Go, C++, Python	Go, C++
Containerization Enabled	Yes (Dockers supported)	Yes (Dockers Enabled)
IOT Devices (Support)	Yes (Light Weight)	No (Very Heavy Components)
Privacy	Quorum (Implemented by JP Morgan and integration with Ethereum public is in progress)	Controlled through ACLs
Governance	Ethereum Foundation (Ethereum Developers)	Linux Foundation backed by IBM
Development Platform (Dev Friendly)	Platform Specific dev Tools (Well defined local/In Memory/Test Blockchain networks for development)	General IDEs (Local and full blown setup)
Deployment Platform	On Prem or Cloud	On Prem or Cloud (More Bluemix Compatible)
Open Source	Yes (Full)	Yes (Partial)
Maturity Level	Running in Production	Enterprise Production Ready

COMMUNITY DRIVEN BLOCKCHAIN TECHNOLOGY STACK

- Top10 Challenges for Blockchain Adoption across the Functional and Technical Areas
- China – Neo Platform (Ant Shares)
- Building a Blockchain Community with in India

  Goals :

  - Building a Blockchain Tech Stack
  - Contributions from/to open source community
  - Connect Industries, R&D orgs, Developers, and Blockchain Enthusiasts
  - Building a Blockchain skill set within Indian Tech Community

Crowdsortium

Q&A

BLOCKCHAIN - VIDEOS

- Blockchain Introduction

  https://www.youtube.com/watch?v=oNhpm9NMVXs

- How the blockchain will radically transform the economy (TED talk)

  https://www.ted.com/talks/bettina_warburg_how_the_blockchain_will_radically_transform_the_economy

- How BlockChain Works

  https://www.youtube.com/watch?v=lD9KAnkZUjU

- Blockchain Demystified (TED Talk)

  https://www.youtube.com/watch?v=40ikEV6xGg4

- BlockChain Visual Demo

  https://www.youtube.com/watch?v=_160oMzblY8

KEY TERMINOLOGY

Glossary	
Bitcoin	The well known cryptocurrency, based on the proof-of-work blockchain
Ledger	An append only record store where records are immutable
P2P	Peer-to-peer (P2P) refers to the decentralized interactions that happen between at least two parties in a highly interconnected network
Participant	An actor who can access the records (Read & Write)
Proof-of-Work	A system that ties mining capability to computational power. Blocks must be hashed
Proof-of-Stake	An alternative to the proof-of-work system, in which your existing stake in a cryptocurrency is used to calculate the amount of that currency that you can mine
Smart Contracts	Are contracts whose terms are recorded in a computer language instead of legal language. Smart contracts can be automatically executed by a computing system, such as a suitable distributed ledger system
Mining	The process by which transactions are verified and added to a blockchain. In Bitcoin world this process of solving cryptographic problems using computing hardware also triggers the release of cryptocurrencies
Blocks	A digitally recorded data in packages. Each block is chained to the next block using a cryptographic signature.