



清华大学

Tsinghua University



Service Research & Innovation Institute

DECENTRALIZING DIGITAL ECONOMY



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CONTENT

- I. Decentralized Ledger Technology
- II. Blockchain
- III. Hashgraph
- IV. Proposal
- V. Roadmap

DECENTRALIZED LEDGER TECHNOLOGY (DLT)

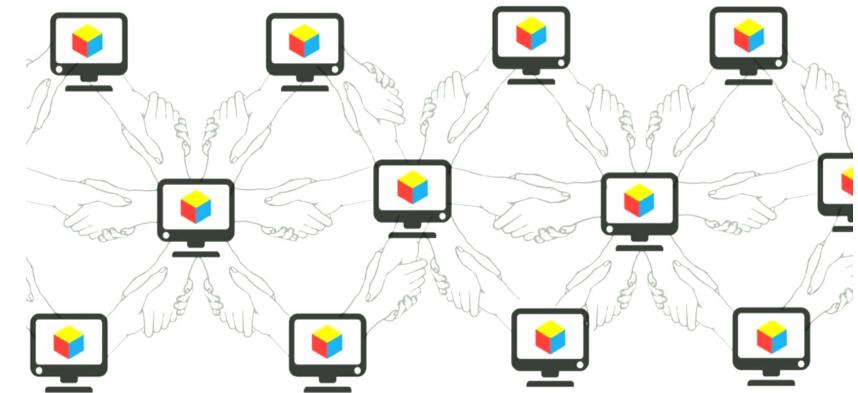
General Terms:

Technology behind

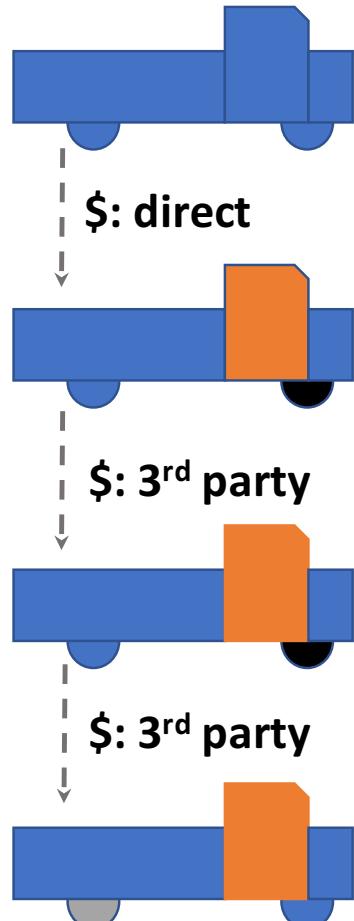


Digital and
decentralized
Ledger

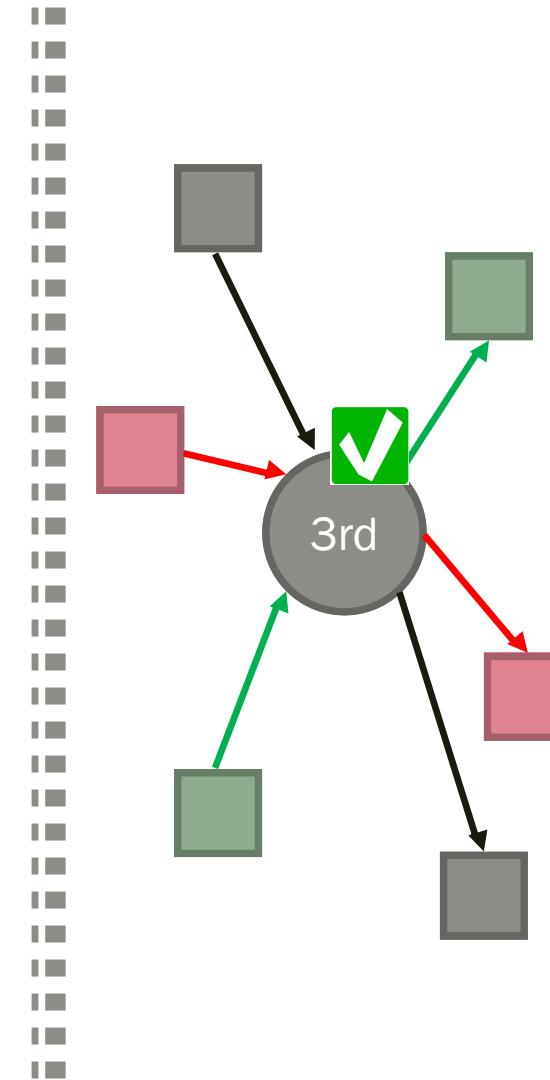
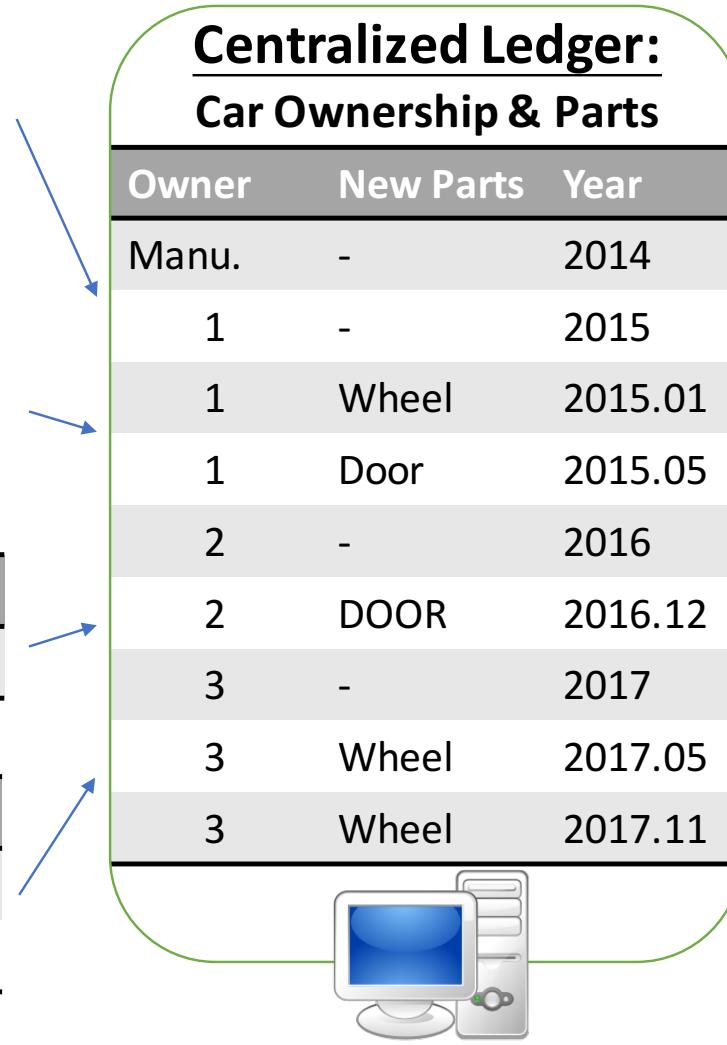
Encrypted, trustworthy, transparent
record of all transactions



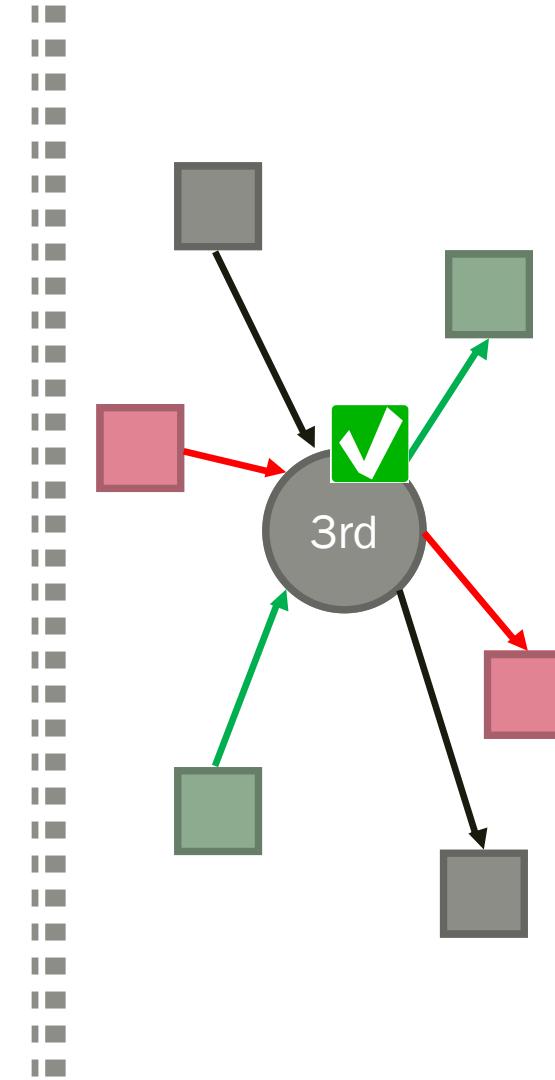
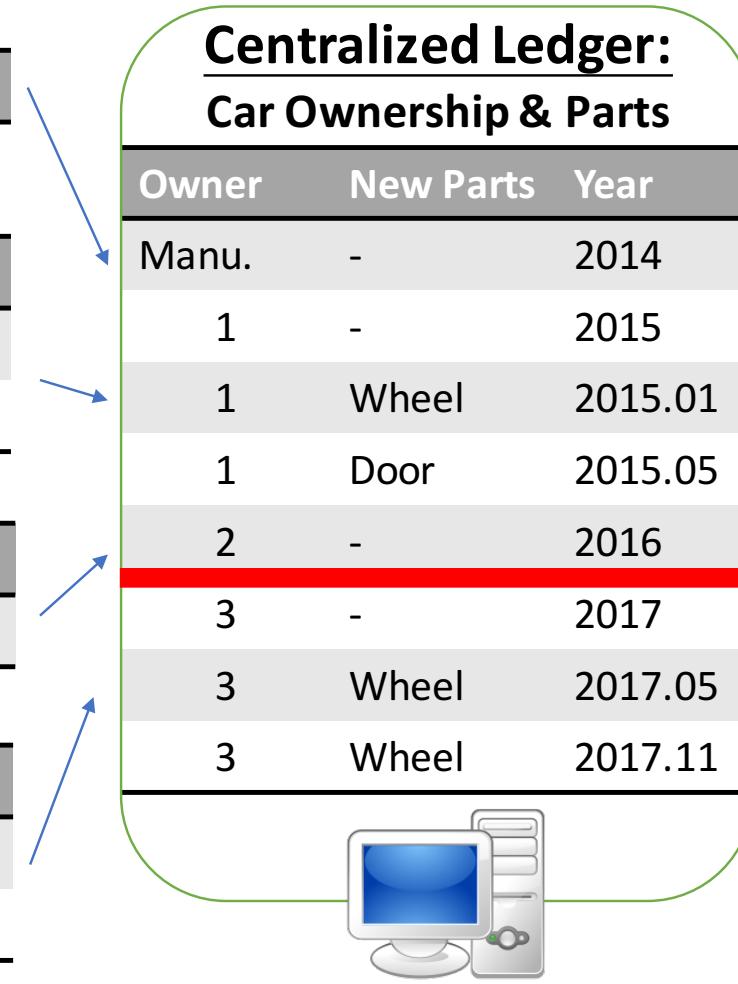
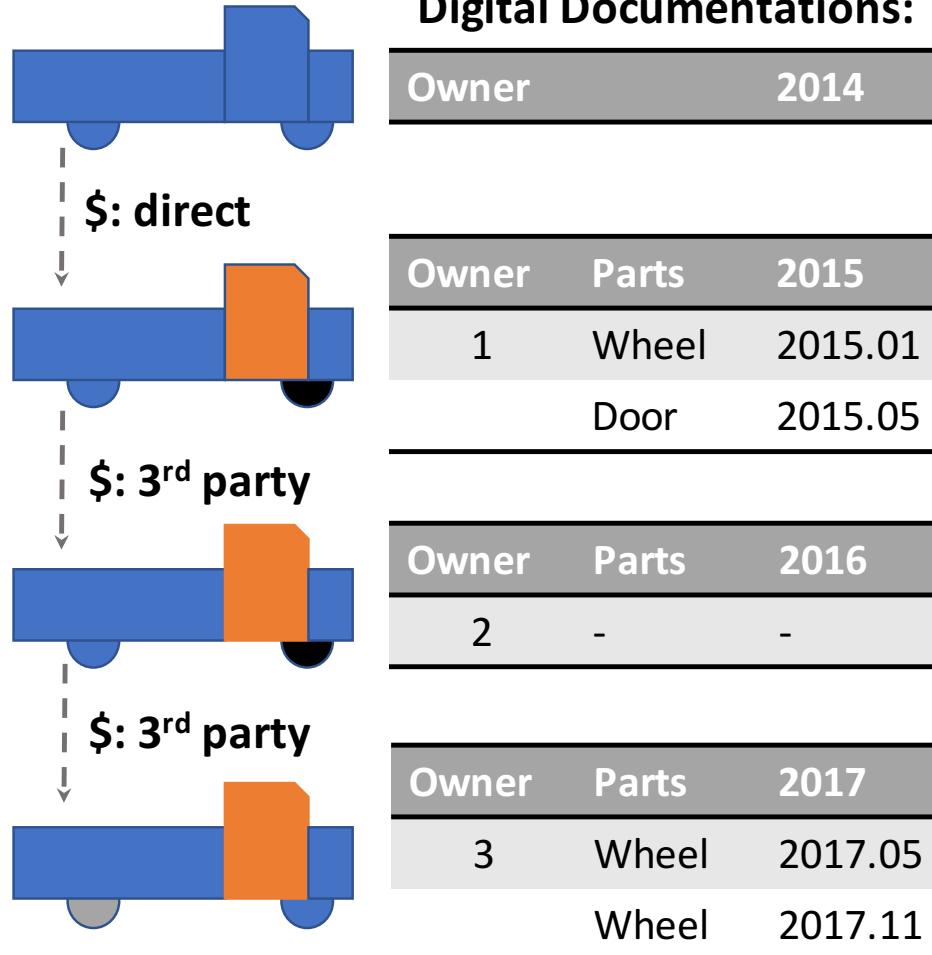
Centralized Ledger



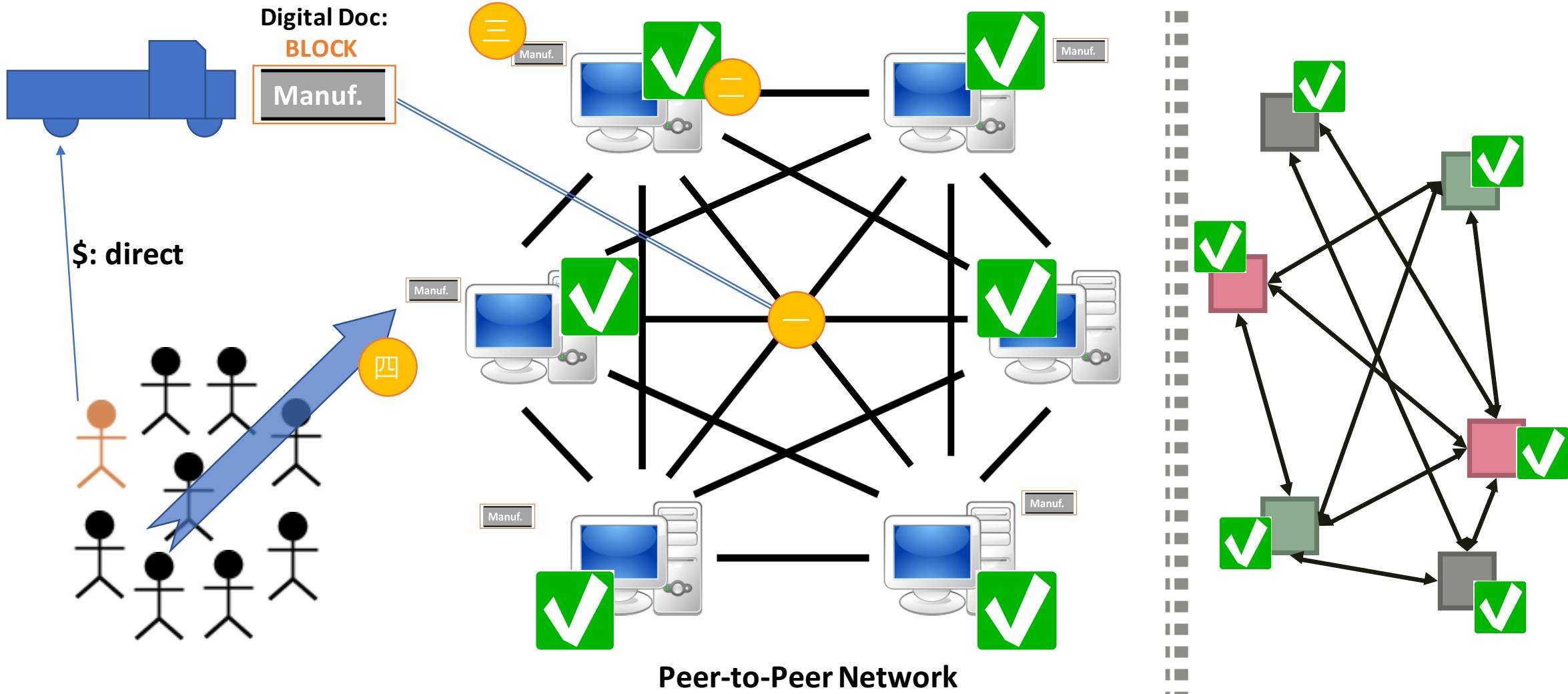
Digital Documentations:		
Owner	2014	
Owner	Parts	2015
1	Wheel	2015.01
	Door	2015.05
Owner	Parts	2016
2	DOOR	2016.12
Owner	Parts	2017
3	Wheel	2017.05
	Wheel	2017.11



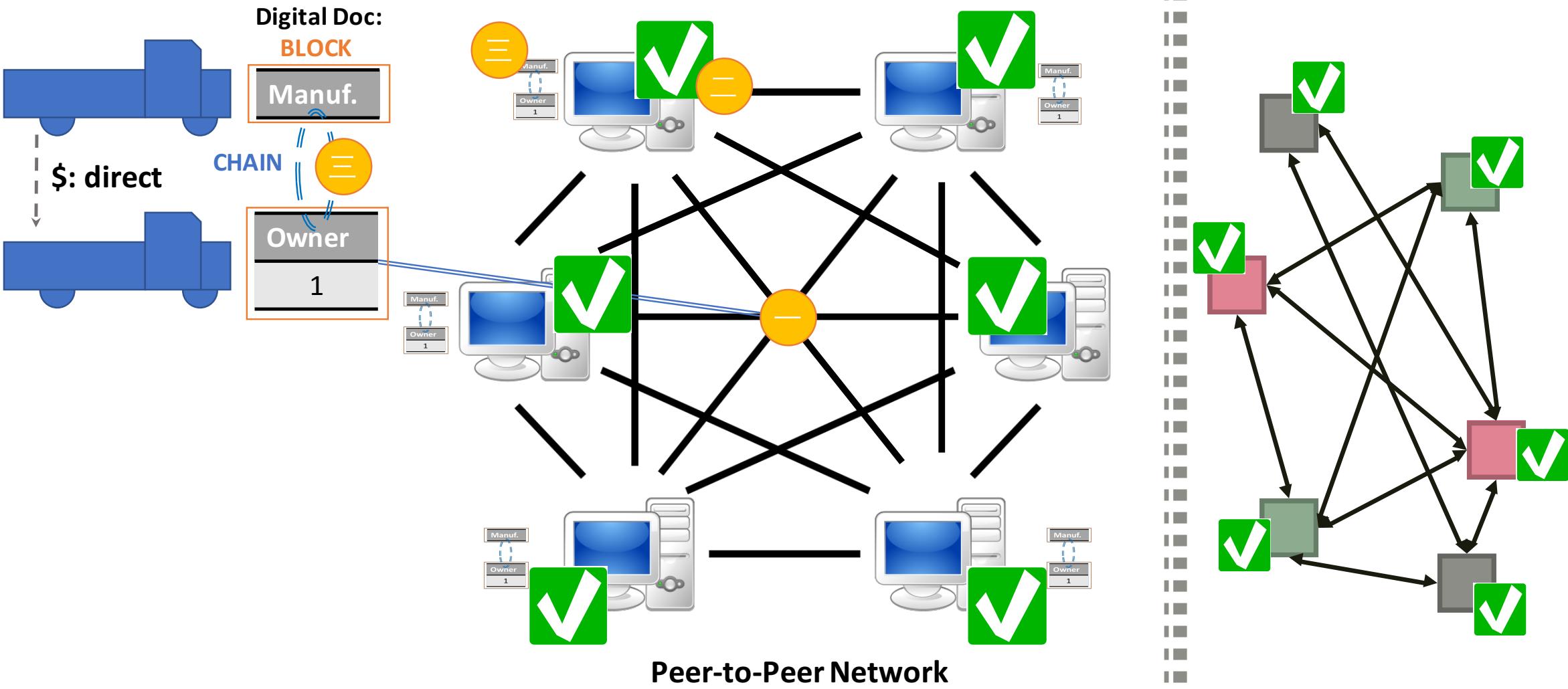
Centralized Ledger



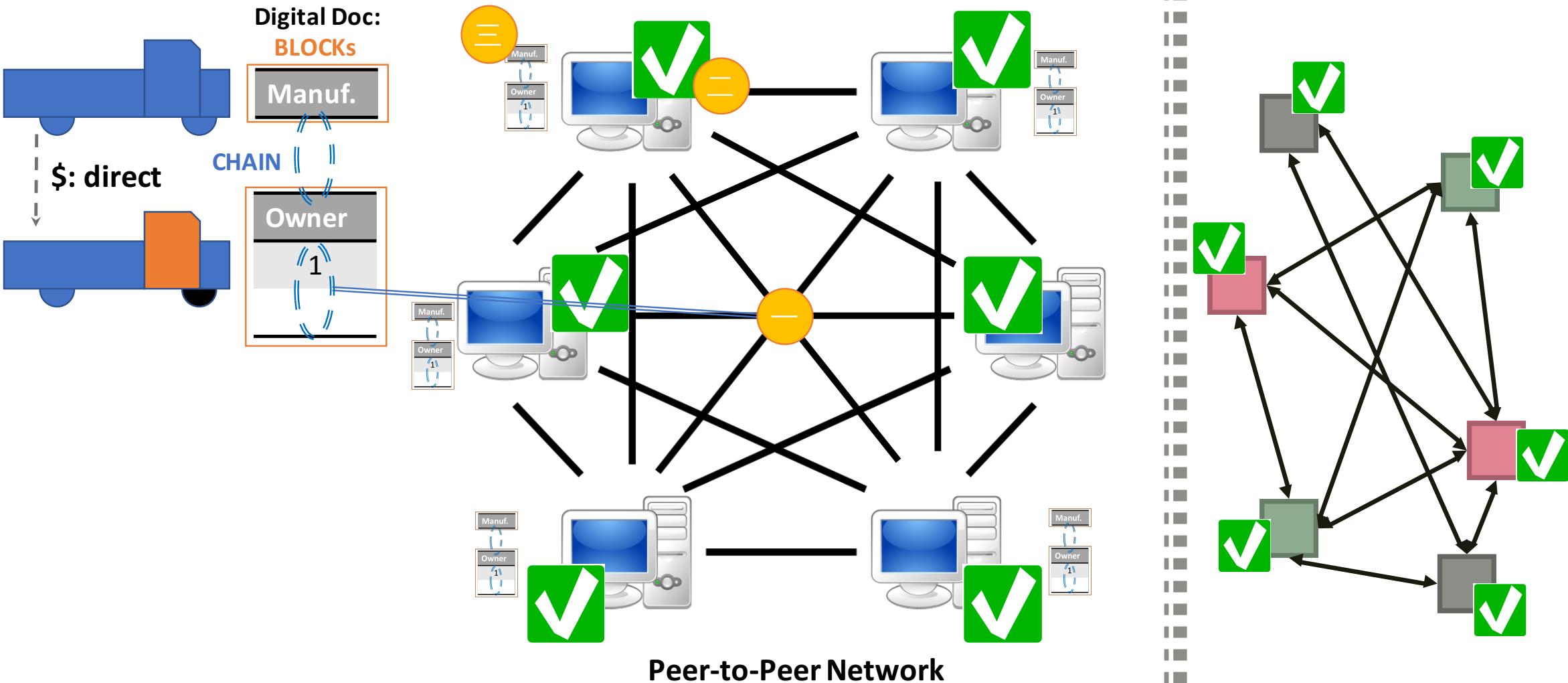
De-Centralized Ledger



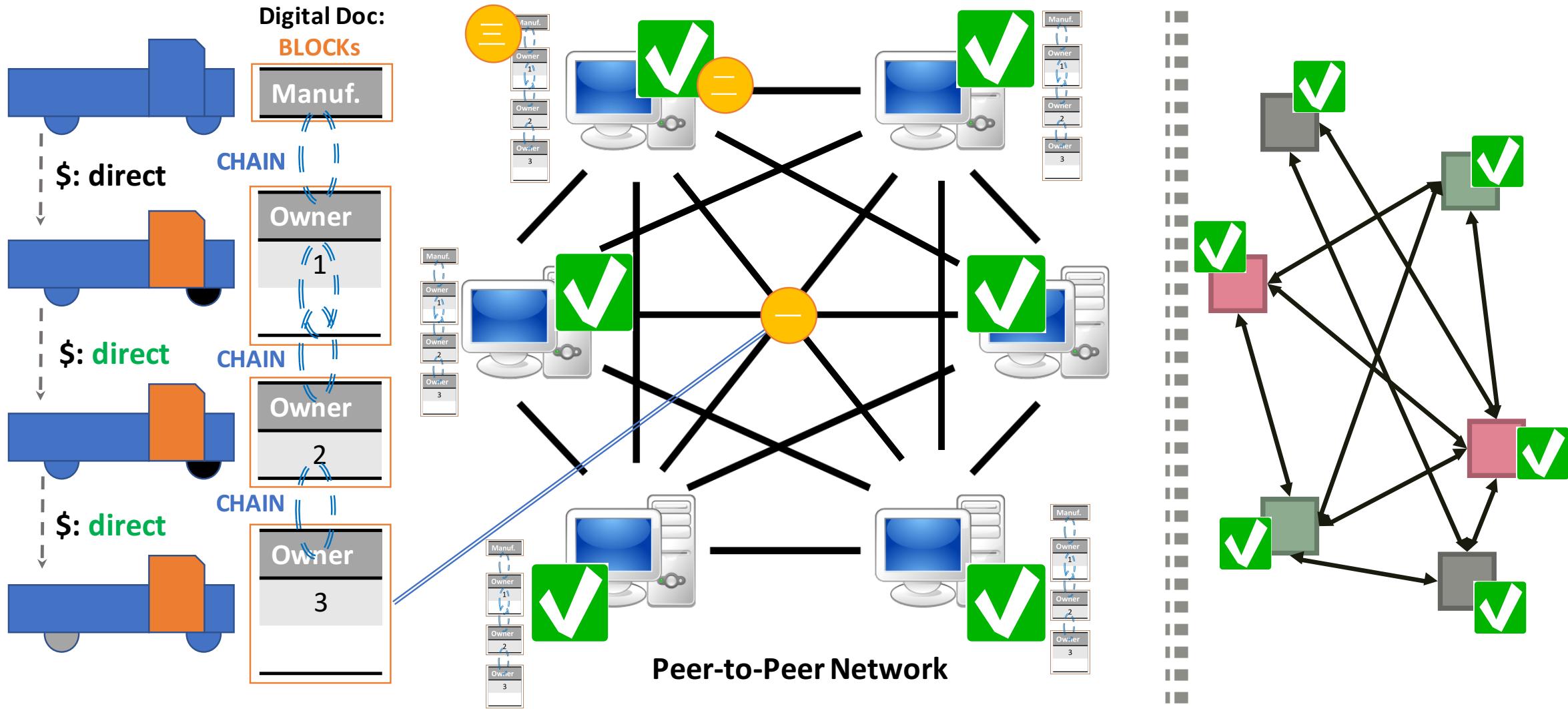
De-Centralized Ledger



De-Centralized Ledger



De-Centralized Ledger



APPLICATIONS

Banking and Payments



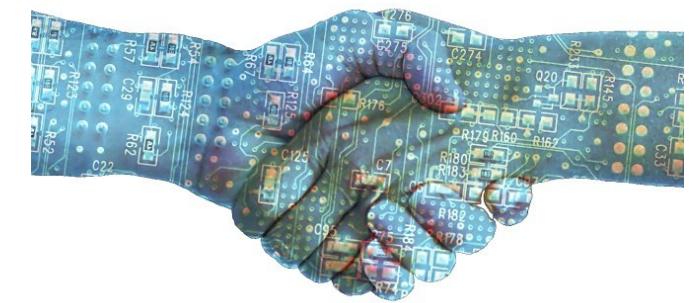
Instant
money
transactions

Low fees or
even no fees

Security
against
frauds

Access to financial
services without
banking

Elimination of a third-
party to validate the
transaction



Supply Chain Management

Transparency

Decentralized database

Permanent item track and record

Avoidance of mistakes caused by human factor

Monitoring of perishable items with Internet of Things



Blockchain Limitations



Block size

The limited block size of 1MB restricts the number of possible transactions per second. A larger block will, on the other hand, increase the time taken until each block is verified before it can be added to the Blockchain.



Scalability

More computational power and stronger hardware is needed to solve the complicated mathematical problems of every transaction. It is expensive to operate with larger blocks.



Standards

To use Blockchain on an industrial scale, there must be certain industry standards as well as legal and governance frameworks to improve robustness, overall performance and security of the technology.



Diverging interest

Replacing existing financial infrastructure will require time and investment. With competing interests between different parties, it will take time to find common ground for collective action.

FUTURE DECENTRALIZED LEDGER TECHNOLOGY

Hashgraph The Future
Of Decentralized
Technology.



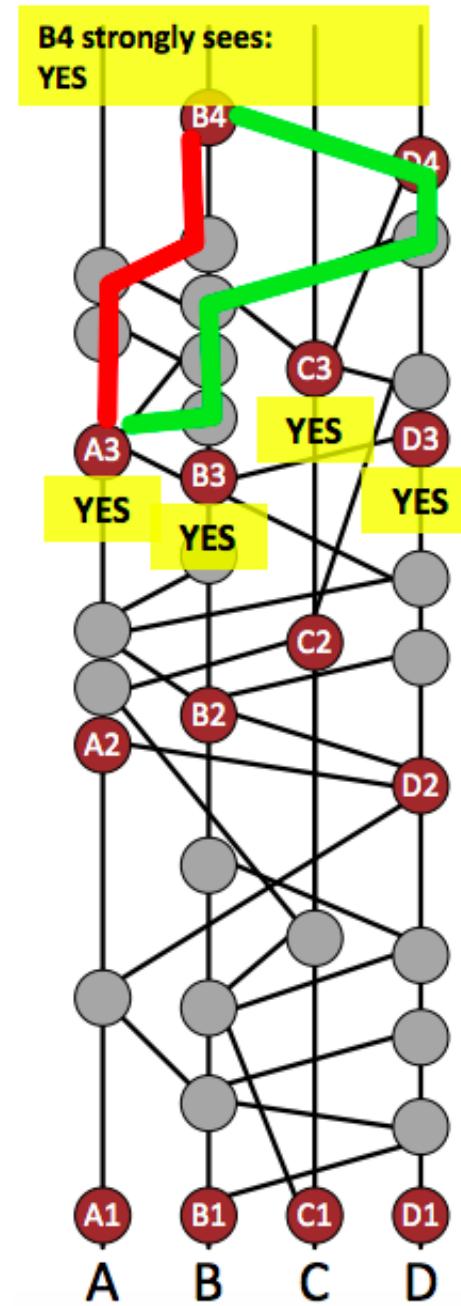
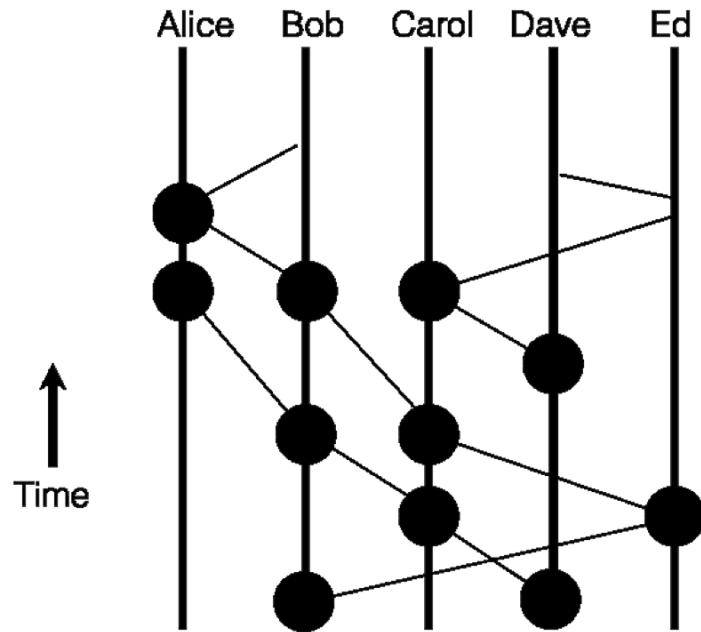
Hashgraph?

A superior decentralized
consensus mechanism

Protocol
“gossip about gossip”



Hashgraph

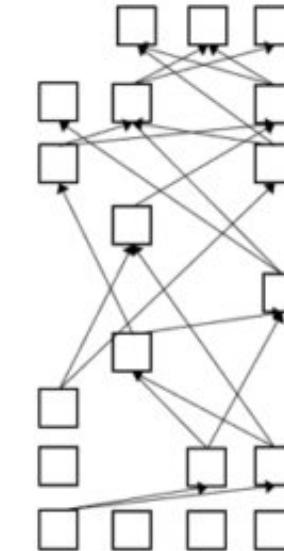
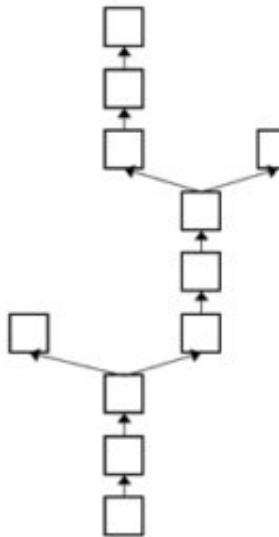


Comparison

Blockchain



Hashgraph



Technology

Block chain

Copyright

Open source

Consensus

Proof of Work: SHA256-Hash

Openness

Public ledger

Applications

Bitcoin

Efficiency (tps)

3-4

Directed acyclic graph

Patented

Virtual voting

Private ledger

Swirls

> 250,000

Why Hashgraph?



Secure

Maintain private and secure data, without having to trust the privacy and integrity of any central server.



Reliable

Deliver applications that are always available; as reliable as the internet.



Fair

Ensure the actual order of transactions is the consensus order, and all transactions are included.



Trusted

Enforce rules, achieve fairness and ensure safety in a highly trusted system.



Fast

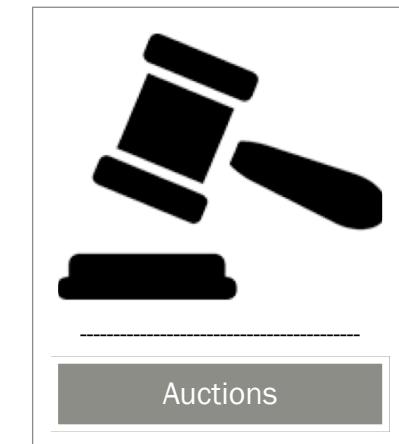
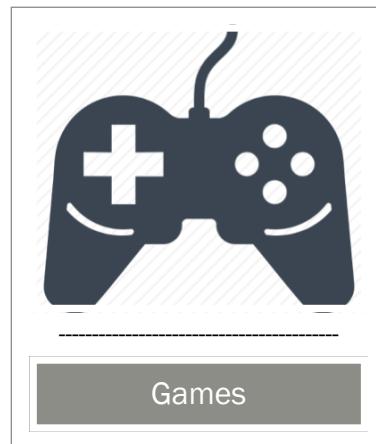
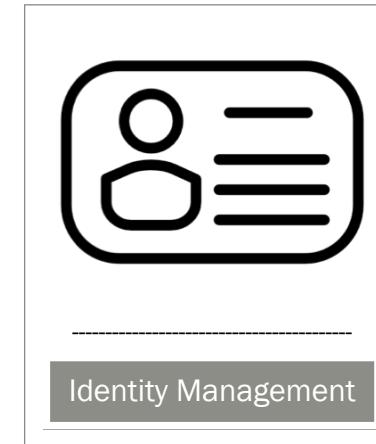
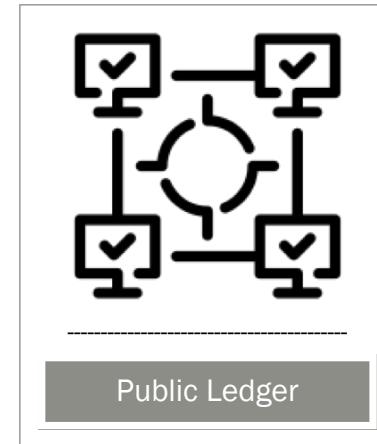
Speed time-to-consensus with more transactions per second.



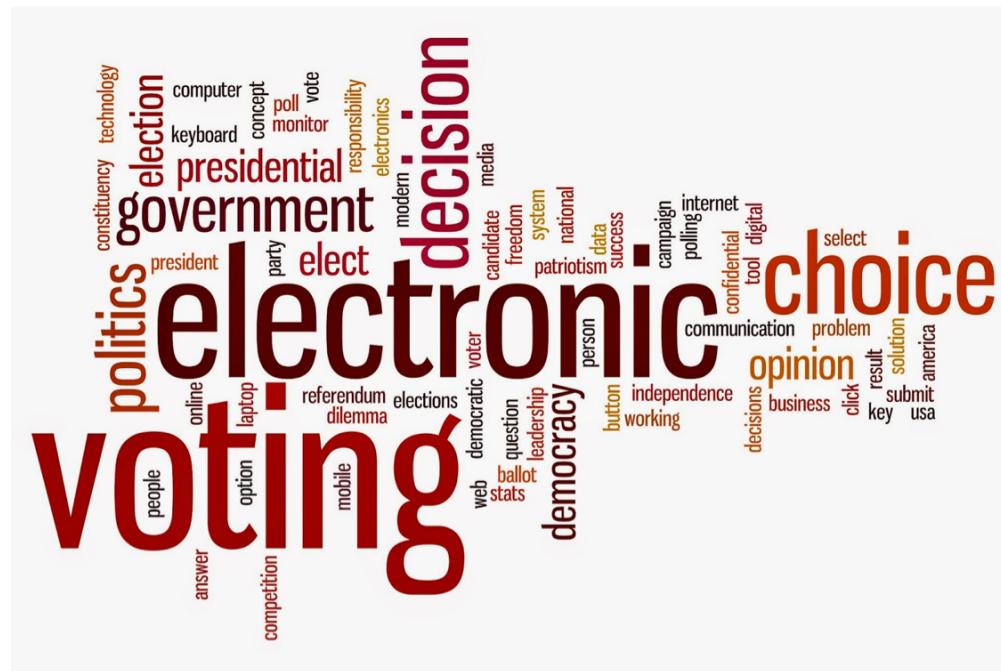
Cost-effective

Build high-throughput, scalable applications without incurring server costs and maintenance.

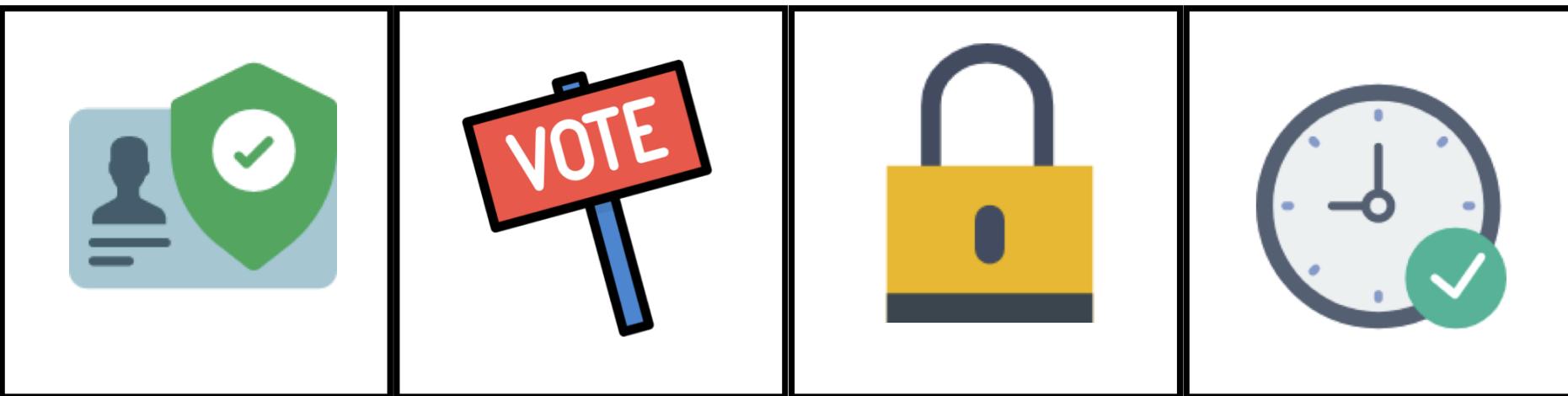
Hashgraph Applications



DECENTRALIZED VOTING SYSTEM



Benefits



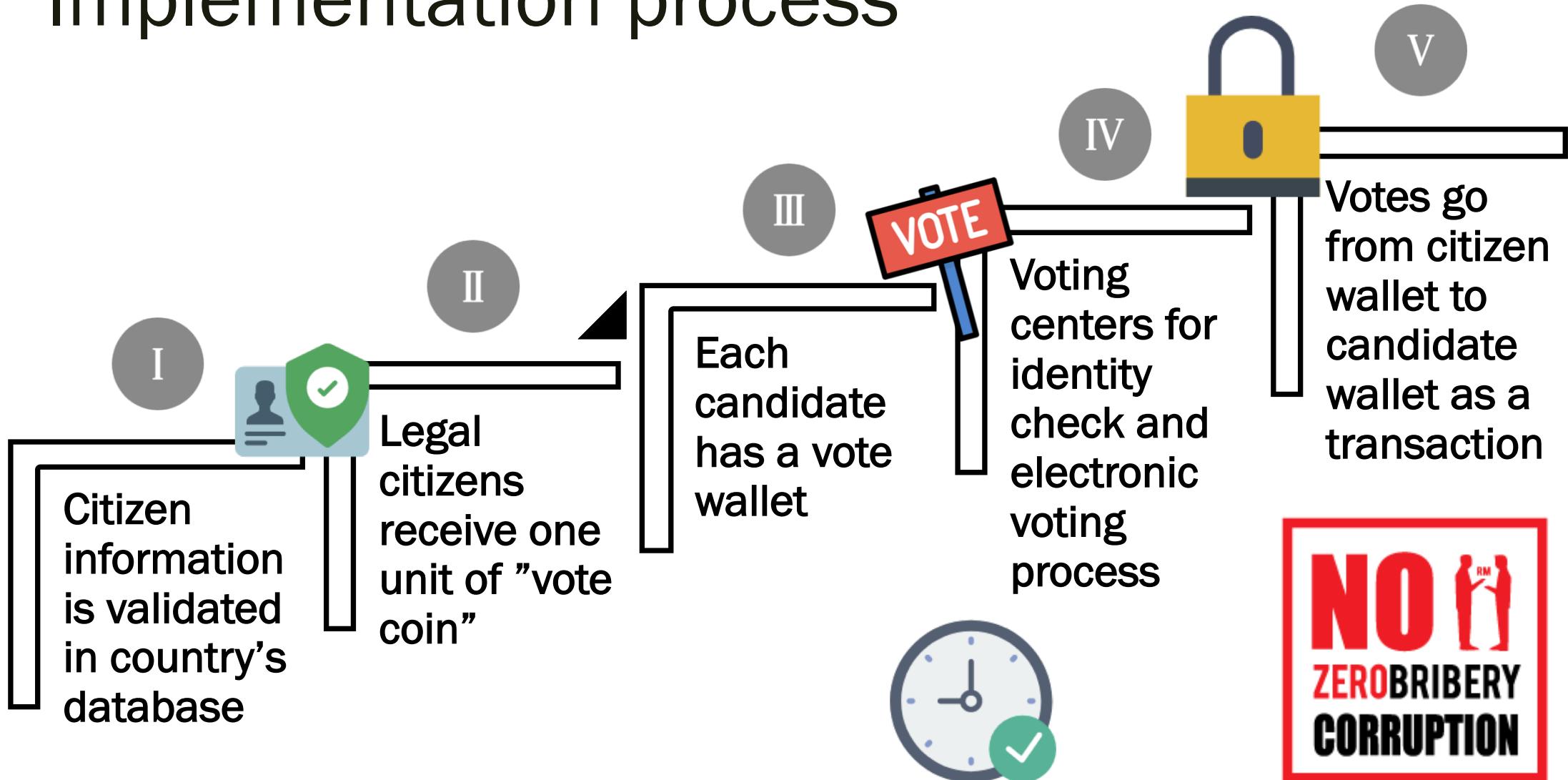
Identity
Validation

Easy Voting

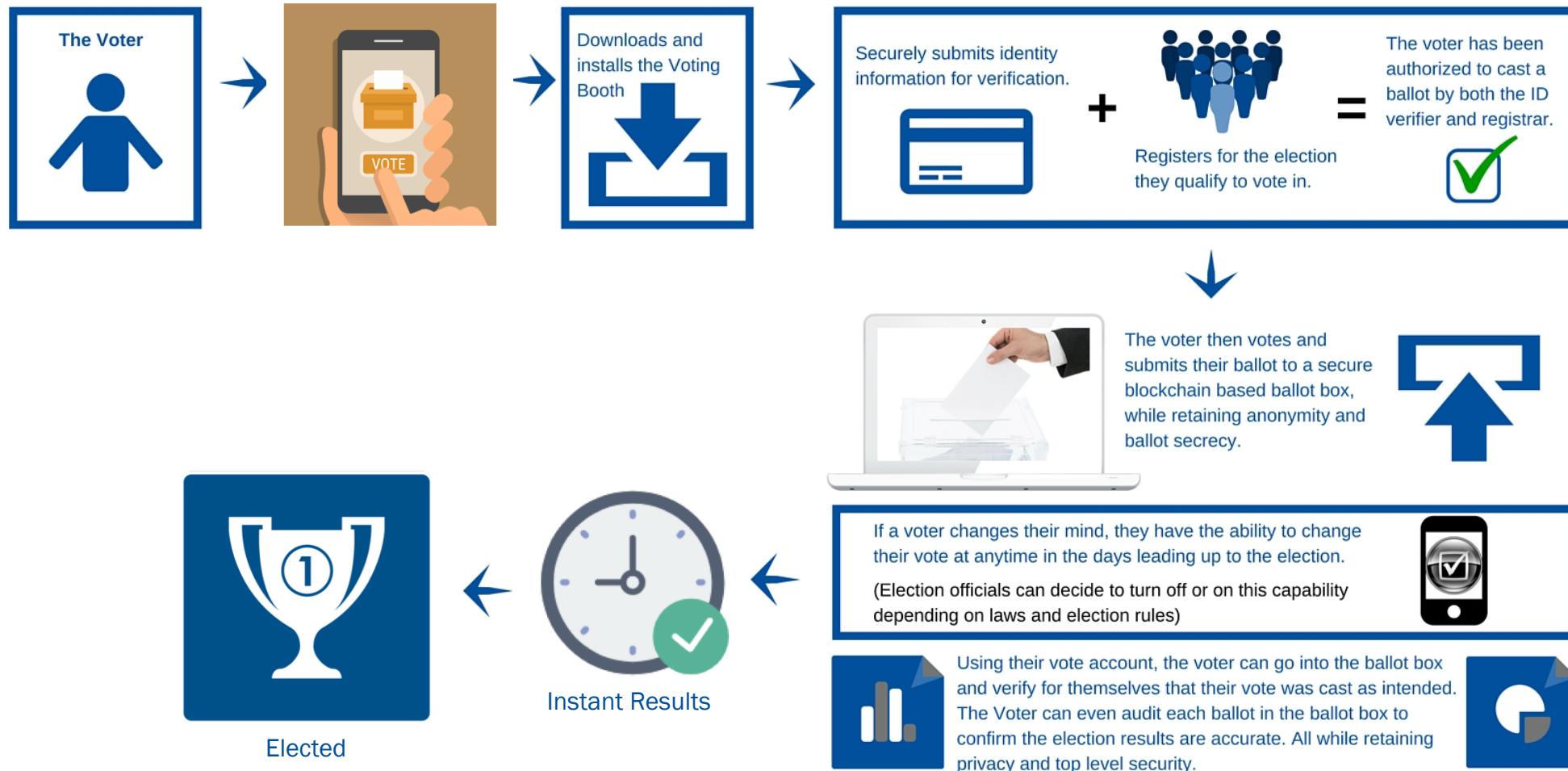
Immutable
Data /
Fraud-Proof

Real-time
Results

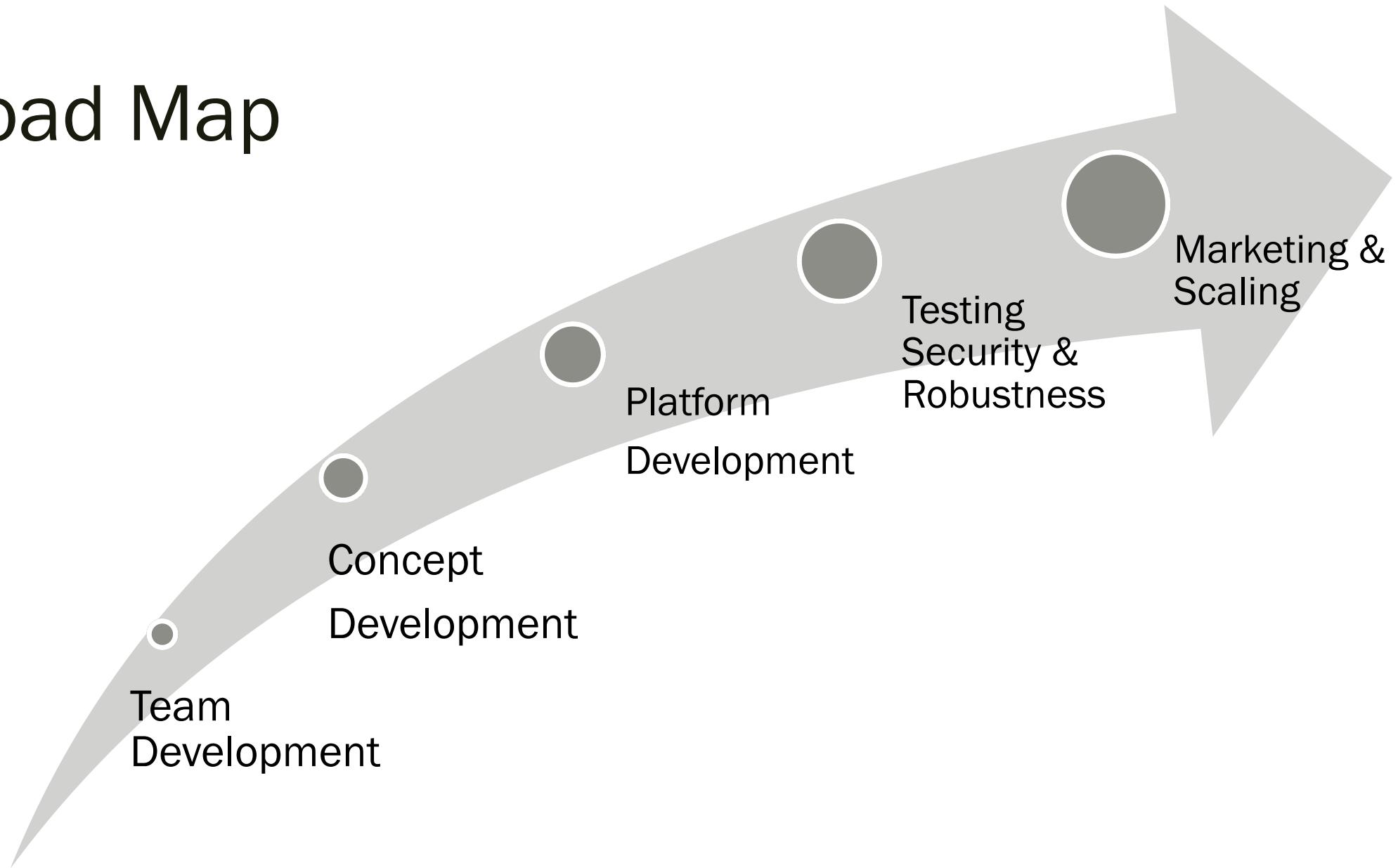
Implementation process



Voting Platform



Road Map



THANK YOU

Back-Up



Supplier	Producer	Distributor	3PL	Retailer	Store	Customer
<ul style="list-style-type: none">Uploads data on anti-bacterial fodderCow is tagged with RFID chip, proving free range	<ul style="list-style-type: none">Gets information on cow and designated beef products, cuts and prepares meat accordinglyAdds QR code to packaging	<ul style="list-style-type: none">Automatically receives notification about receipt of beef productsChooses suiting 3PL based on fully available data on customer, delivery date etc.	<ul style="list-style-type: none">Is informed about origin and destination of beef productsReviews instructions how to store the productsFlexibly optimizes network flows	<ul style="list-style-type: none">Runs machine learning-based forecastingAdds potential recipes & wine suggestions to the data recordProvides app for end-customer	<ul style="list-style-type: none">Has full transparency on delivery timeAdapts orders, promos, etc. accordingly	<ul style="list-style-type: none">Scans QR code via appGets insights into beef origin, ageing duration, etc. and suited recipes and winesEarns points in cross-company loyalty program