The Blockchain and Automotive
Hype, Reality and Possibilities

Vasily Suvorov, VP Technology Strategy

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What is Distributed Ledger Technology? (AKA Blockchain)
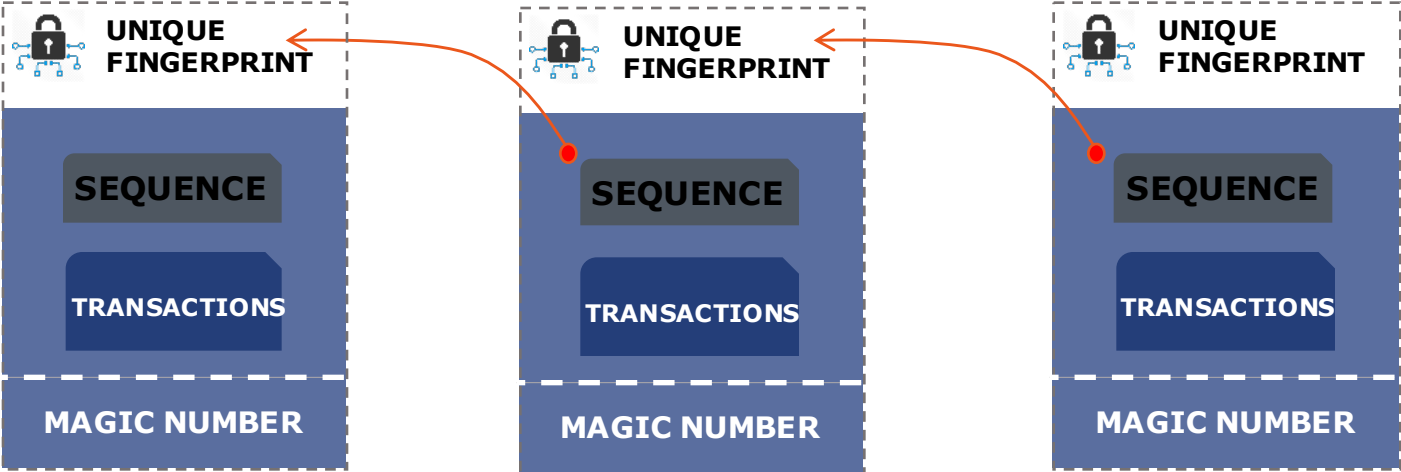
Decentralized Data-Sharing Technology that:

♦ Connects participants in a business ecosystem without a central intermediary

♦ Maintains real-time, add-only, unchangeable ledger and history of transactions

♦ Automates business rules execution

The promise of the blockchain
The trust machine
Oct 31st 2015 |
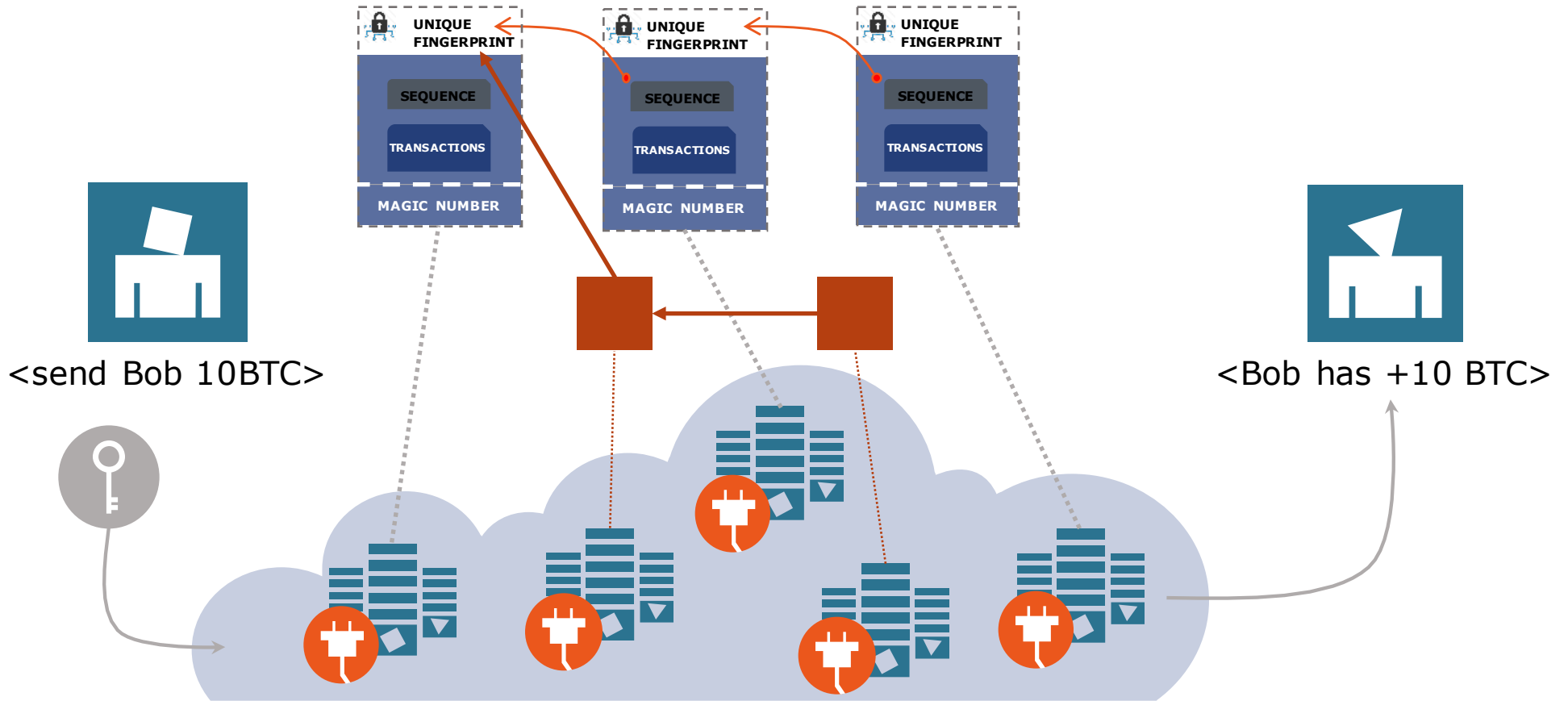The technology behind bitcoin could transform how the economy works

The Economist

Made possible by a unique combination of
Peer-to-peer communications,
Strong encryption,
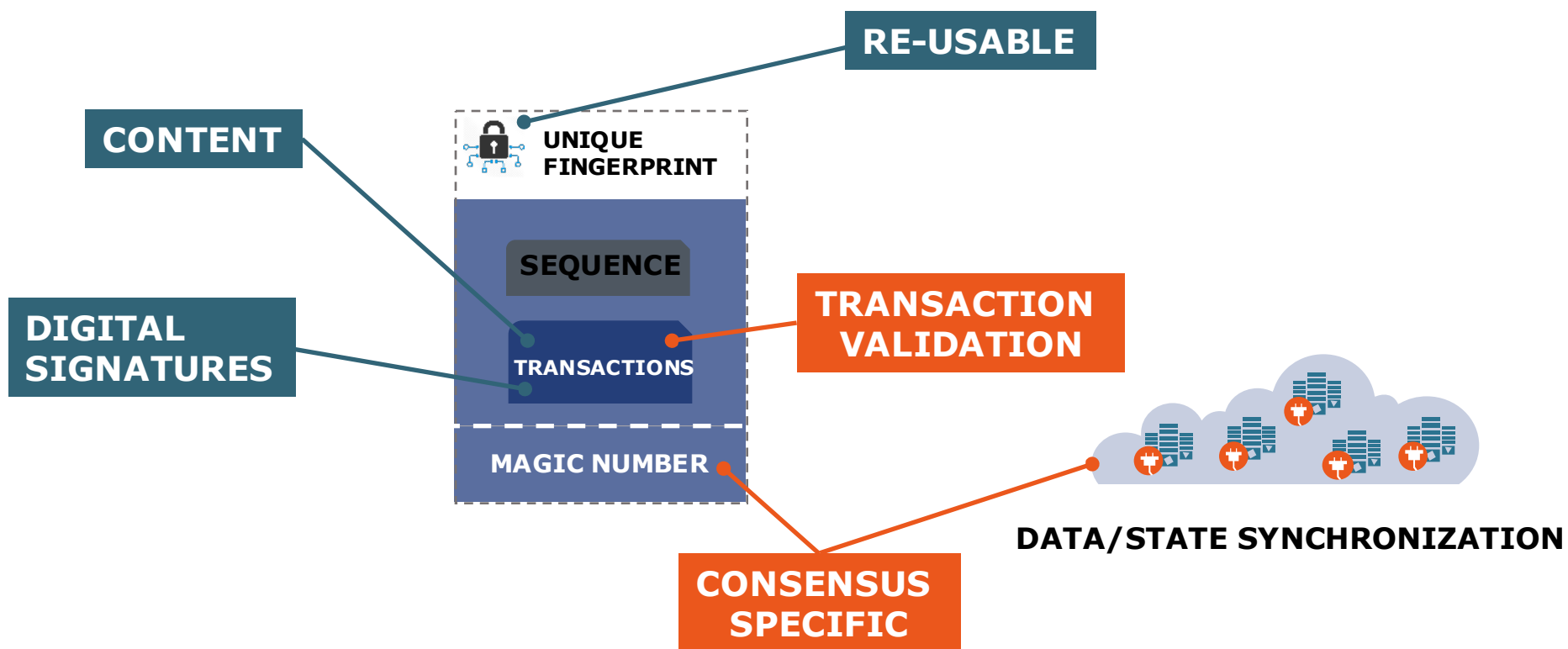**Distributed consensus** and
Smart contracts

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Blockchain 101

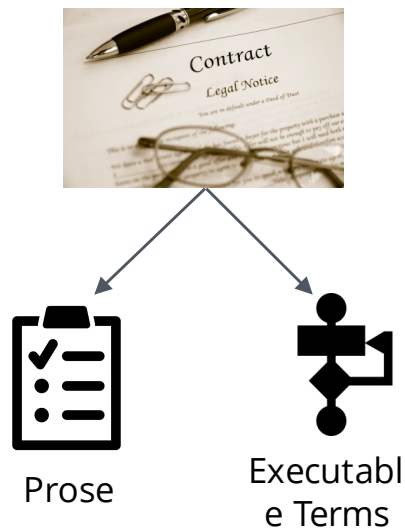| UNIQUE FINGERPRINT	UNIQUE FINGERPRINT	UNIQUE FINGERPRINT
SEQUENCE	SEQUENCE	SEQUENCE
TRANSACTIONS	TRANSACTIONS	TRANSACTIONS
MAGIC NUMBER	MAGIC NUMBER	MAGIC NUMBER

The key to Confusion - Consensus

UNIQUE FINGERPRINT

SEQUENCE

TRANSACTIONS

MAGIC NUMBER

UNIQUE FINGERPRINT

SEQUENCE

TRANSACTIONS

MAGIC NUMBER

UNIQUE FINGERPRINT

SEQUENCE

TRANSACTIONS

MAGIC NUMBER

<send Bob 10BTC>

<Bob has +10 BTC>

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Application-Specific Parts of Blockchain

RE-USABLE

CONTENT

UNIQUE FINGERPRINT

SEQUENCE

DIGITAL SIGNATURES

TRANSACTIONS

TRANSACTION VALIDATION

MAGIC NUMBER

CONSENSUS SPECIFIC

DATA/STATE SYNCHRONIZATION

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Smart Contracts Intro

"Ideal Smart Contract"

Prose

Executable Terms

> *A smart contract is a computerized transaction protocol that executes the terms of a contract**
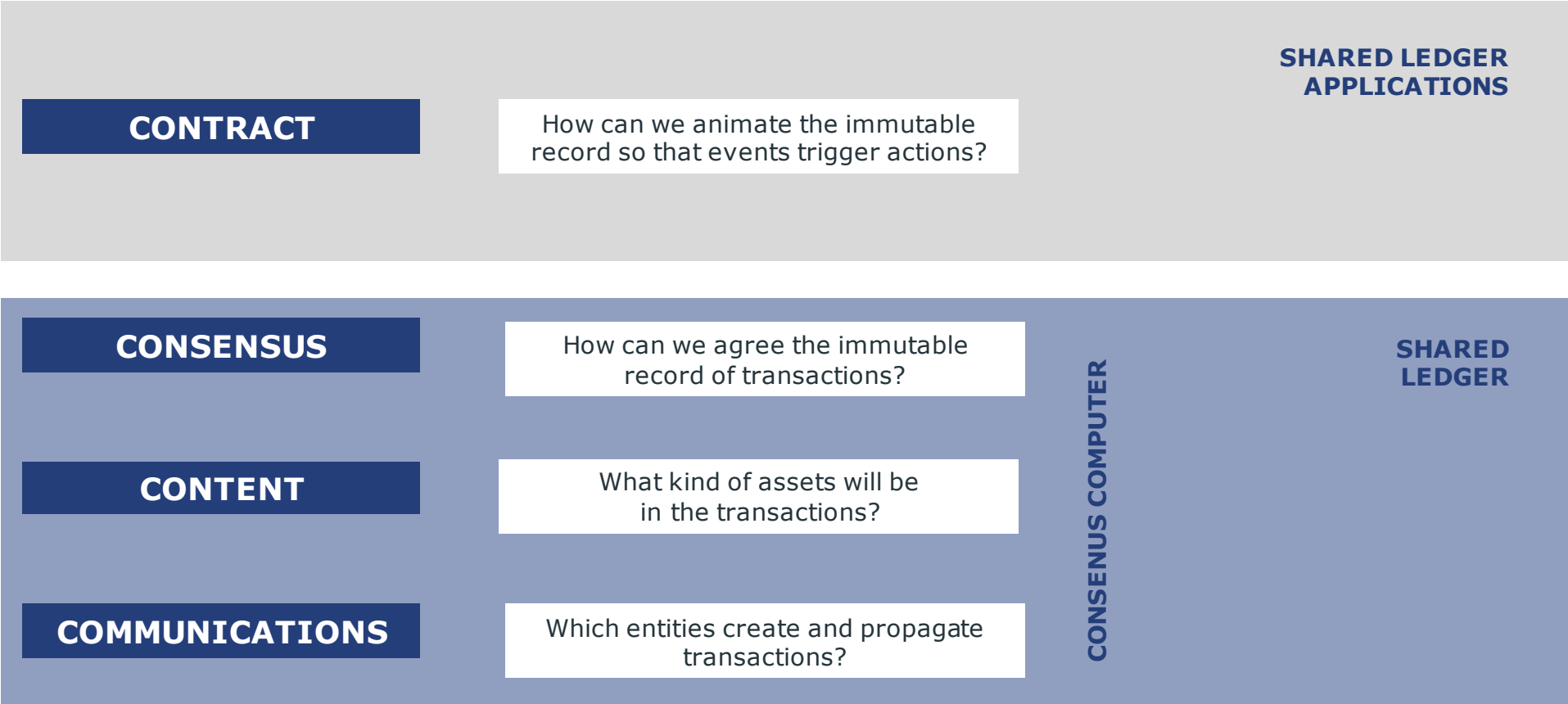
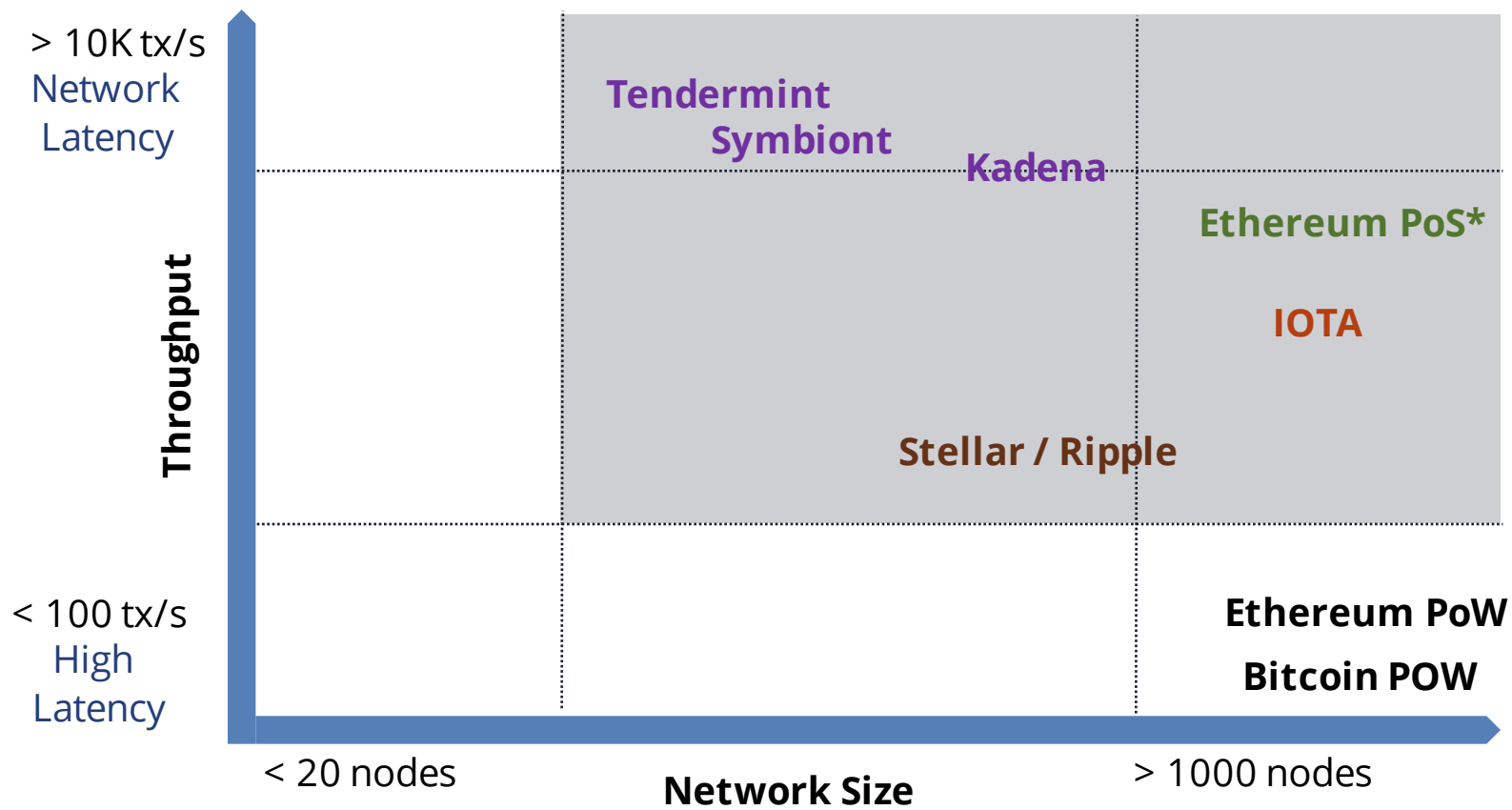## Current Implementations

- Signatures
- Balances
- Conditions

- Turing Complete
- Balance
- KV Store

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Platform Selection and Business Mapping Framework (4C Model*)

CONTRACT

How can we animate the immutable record so that events trigger actions?

SHARED LEDGER APPLICATIONS

CONSENSUS

How can we agree the immutable record of transactions?

CONTENT

What kind of assets will be in the transactions?

COMMUNICATIONS

Which entities create and propagate transactions?

CONSENUS COMPUTER

SHARED LEDGER

*(*Source: Consult Hyperion 2015)*

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Can blockchains scale?

Throughput (y-axis):
- > 10K tx/s Network Latency
- < 100 tx/s High Latency

Network Size (x-axis):
- < 20 nodes
- > 1000 nodes

Tendermint
Symbiont
Kadena
Ethereum PoS*
IOTA
Stellar / Ripple
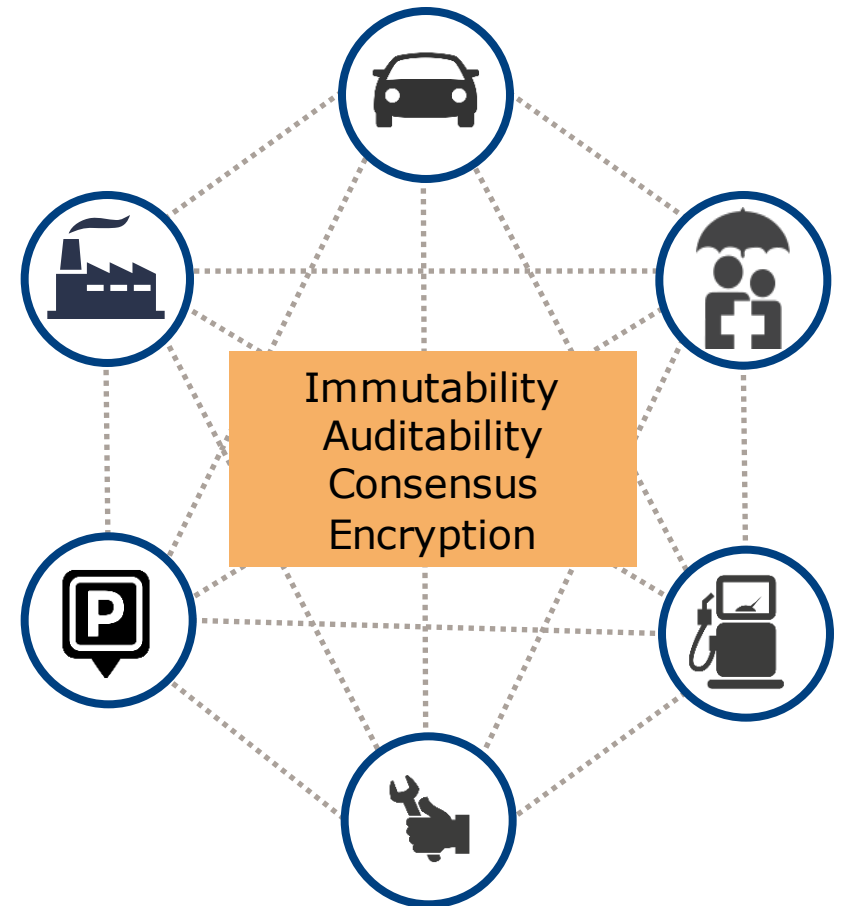**Ethereum PoW**
Bitcoin POW

BLOCKCHAIN FOR AUTOMOTIVE

Promising Use-Cases

- Payments

- Identity

- Supply Chain & Manufacturing

- Extended Services

- V2X

Connecting multiple players and processes to improve:

- Connected Car Ecosystem – How Data & Apps are used

- Mobility Services – How cars are shared

- Security & Safety – Addressing hacking and privacy concerns
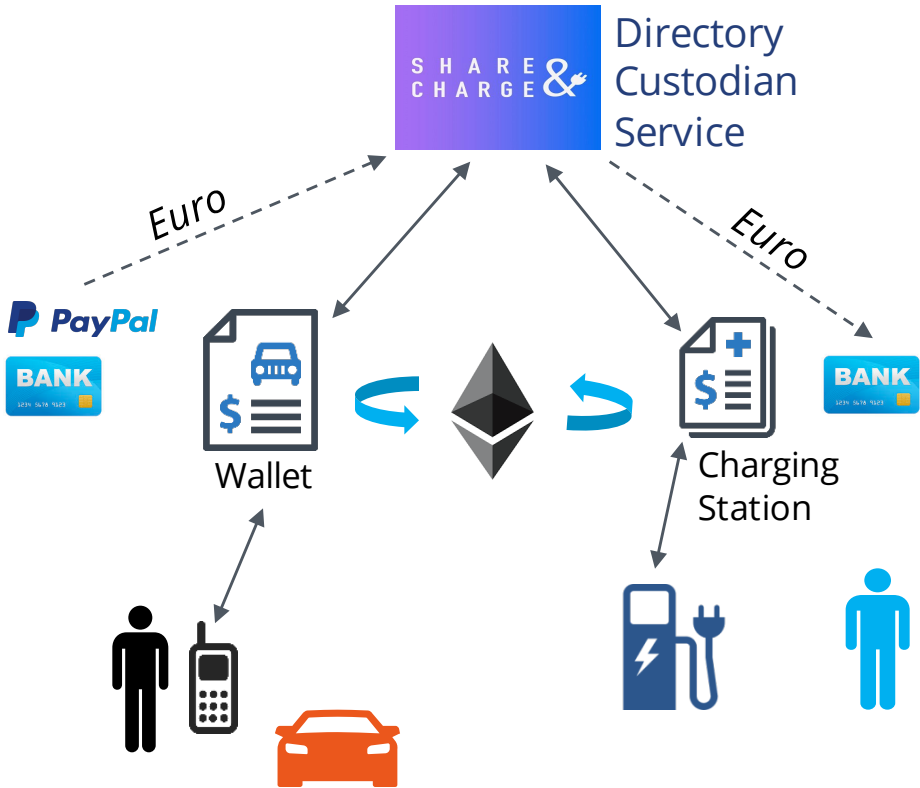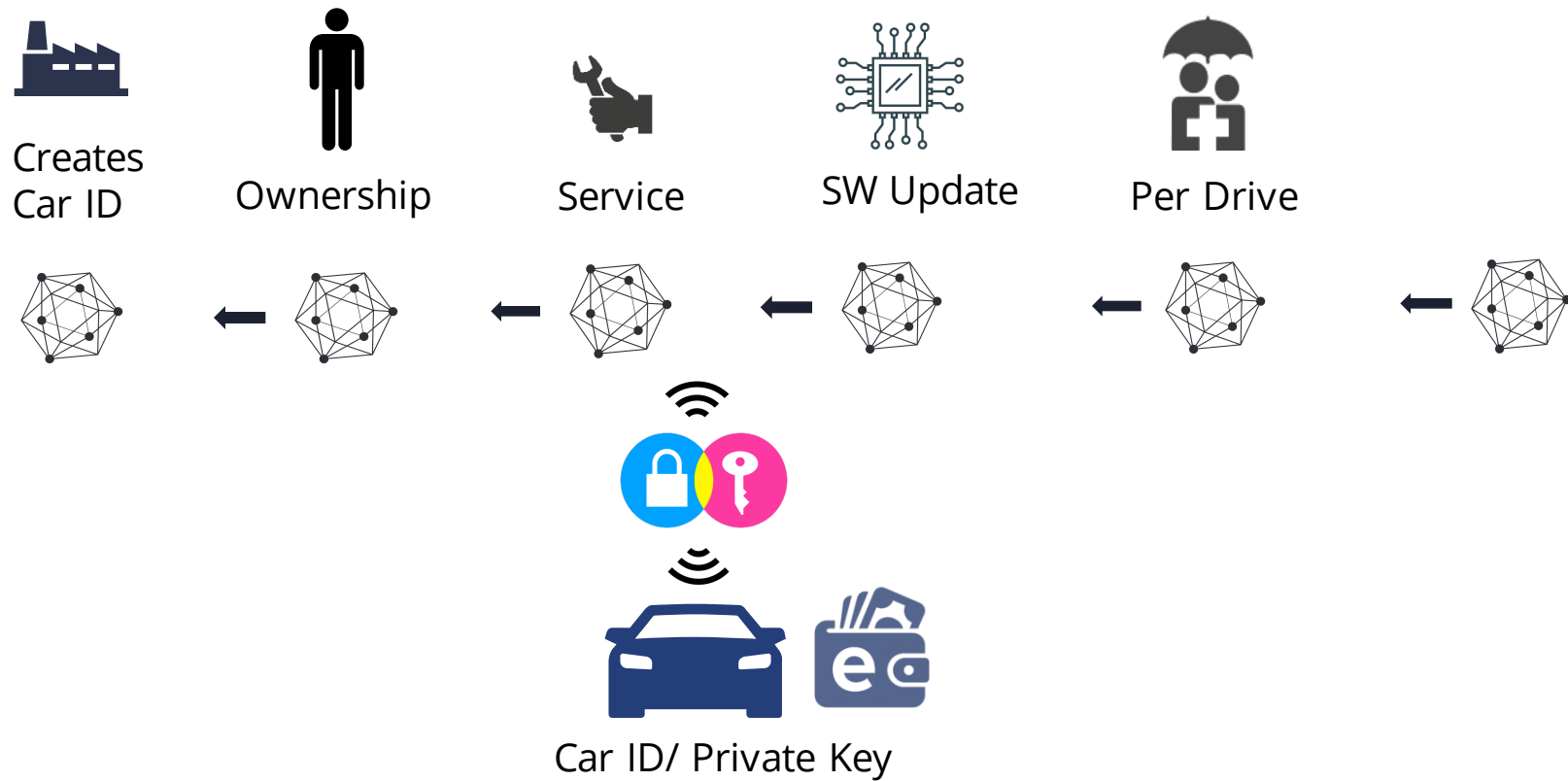
- Ownership - How cars are owned

Immutability
Auditability
Consensus
Encryption

P2P Charging for Electric Cars

SHARE & CHARGE

Launched on 5.5.2017

1100+ charging stations

SHARE & CHARGE — Directory Custodian Service

Euro

Euro

PayPal

BANK

Wallet

Charging Station

BANK

Taking Advantage of de-centrilized ecosystem

Creates
Car ID

Ownership

Service

SW Update

Per Drive

Car ID/ Private Key

Summary

- Blockchain is rapidly developing beyond Financial Services

- Automotive industry is facing fundamental transformation and blockchain is a natural fit

- Autonomous cars will require decentrilized ecosystem

- Standards and co-operation is required to make real progress

Genivi is a great place to embrace the technology and make progress together