Blockchain & Distributed Ledgers

Cork Blockchain #1, 2018-05-01

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Claru

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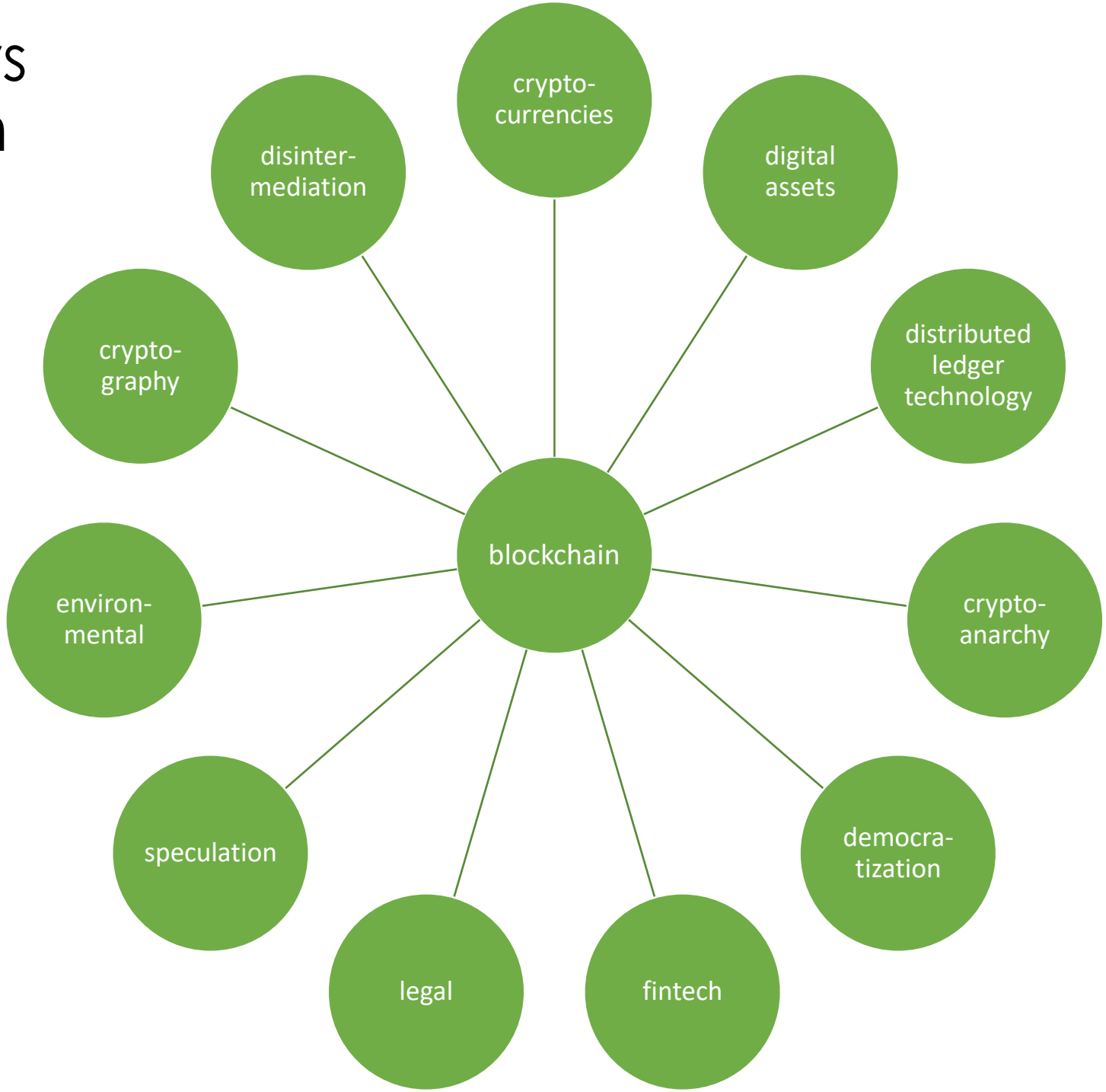
Agenda

1) High-Level Overview

2) Meetup Consensus

images:
https://www.biggerpockets.com/renewsblog/2014/07/18/high-level-overview-literally-30-unique-real-estate-markets-around-world/
https://medium.com/@bitcoinroundtable/bitcoin-roundtable-consensus-266d475a61ff

Different Views on Blockchain



1) High Level Overview

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https://www.biggerpockets.com/renewsblog/2014/07/18/high-level-overview-literally-30-unique-real-estate-markets-around-world/

When we interact/transact with others, we often delegate **Trust** to **Intermediaries**

producer, provider, seller, lender

consumer, recipient, buyer, borrower

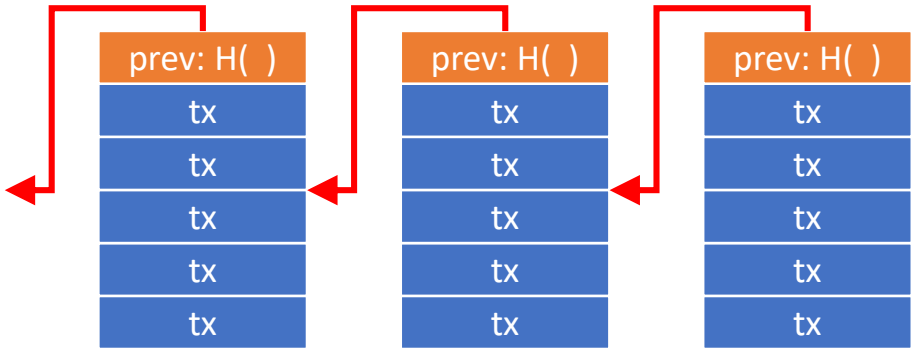
If we had a trusted **Shared Ledger** many of those Intermediaries would no longer be necessary

1. Shared, distributed **Ledger**
2. Immediate **Consensus** on "State of the World"
3. **Tamper-Proof**
4. **Public**, anyone can access, validate
5. **Transactions** change the state

sources:
https://commons.wikimedia.org/wiki/File:Server-based-network.svg
http://www.gjermundbjaanes.com/img/posts/distributed_ledger.png

How can we achieve a shared, trusted Ledger **without Trust between Parties**?

- Block = List of Transactions
- Blockchain = Chain of Blocks
  - Tamper-Proof
- Consensus (PoW)
  - Miners expend energy to find hash puzzle solution
  - Other nodes accept block if it is valid
- Trustless
  - Nodes assumed to be untrusted
  - Fair Lottery, Cryptography ensure that no one can cheat



source: https://medium.com/@brettking/abc61b2ab49a

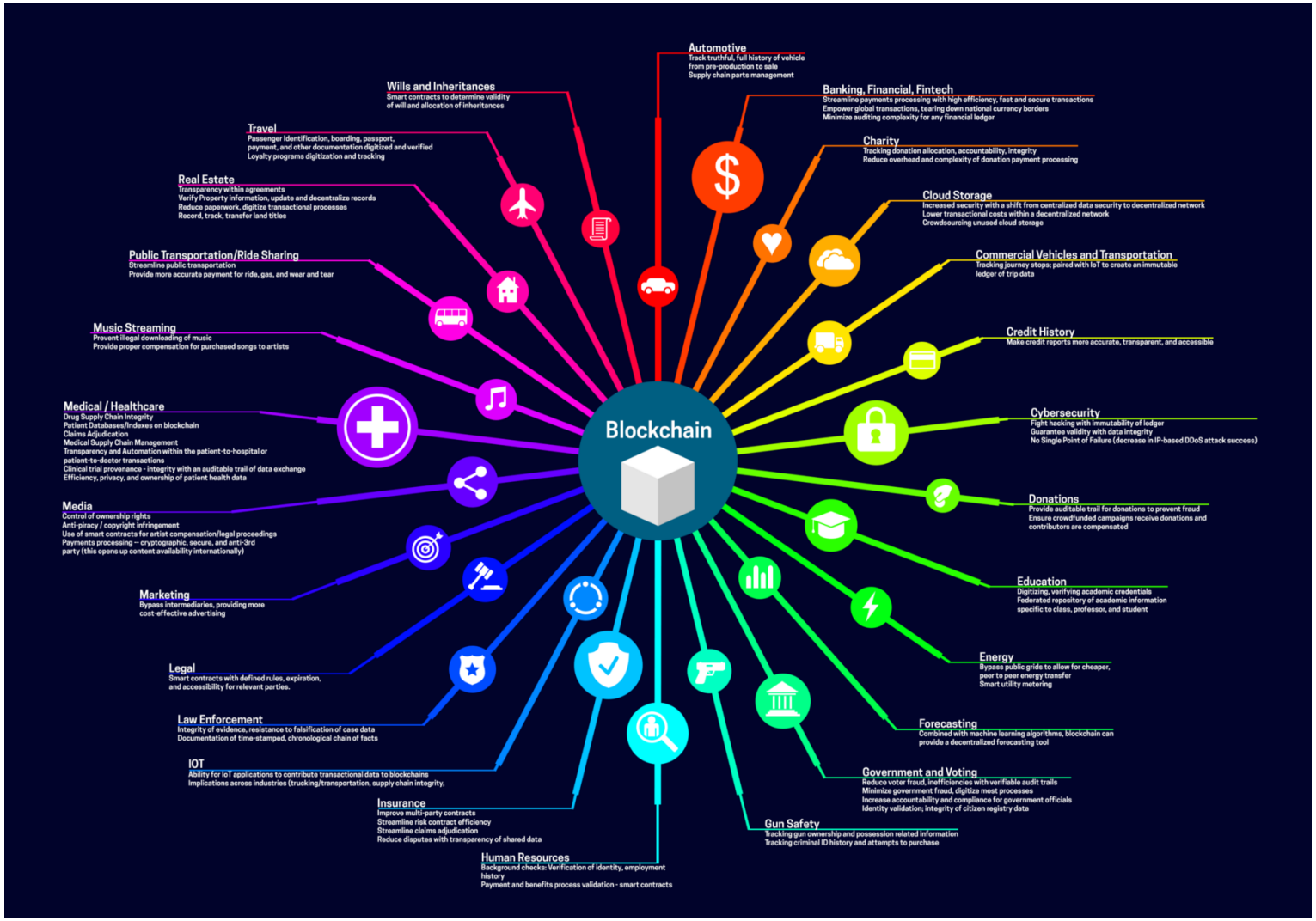
A **Consortium Blockchain** can address some Challenges Companies may find with Public Blockchains

- Group of known, semi-trusted parties
- Access granted by members
- Consensus ~ majority vote (BFT)
- Consensus can withstand 1/3 of malicious nodes
- Easier Governance

Public	Consortium
Data is Public	Privacy, Confidentiality
Transactions are Public	Private Channels
Pseudonymous	Known participants
Anyone can join	Permissioned
Anyone can access	Permissioned
Trustless Nodes	Semi-Trusted Nodes
Low tx/s	High tx/s
	GDPR Compliance

What are some of the Blockchain **Use Cases** for Companies?

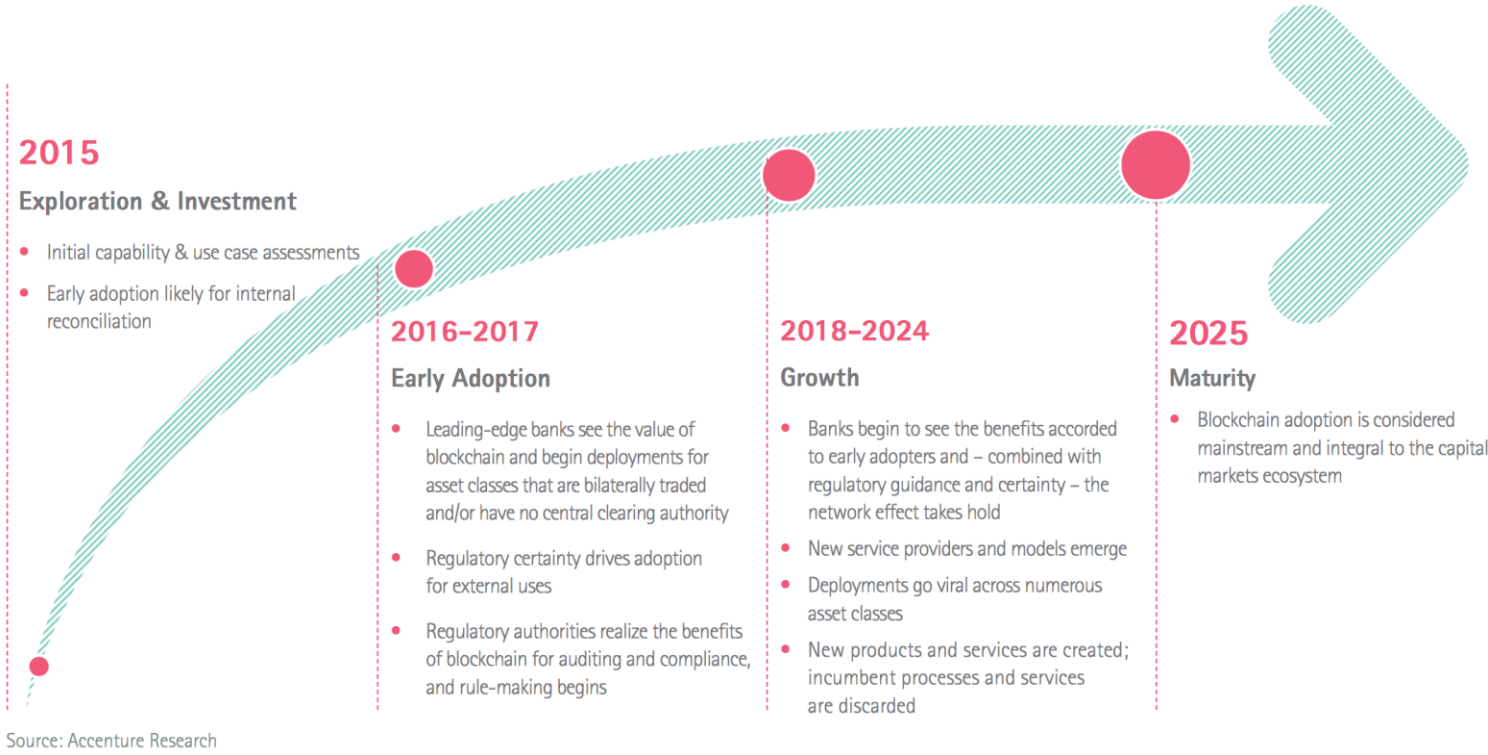
- Data Exchange between multiple parties
- End-to-End Supply Chain Transparency
- Product Traceability
- Marketplaces, Trading
- Clearance & Settlement
- Public Registries



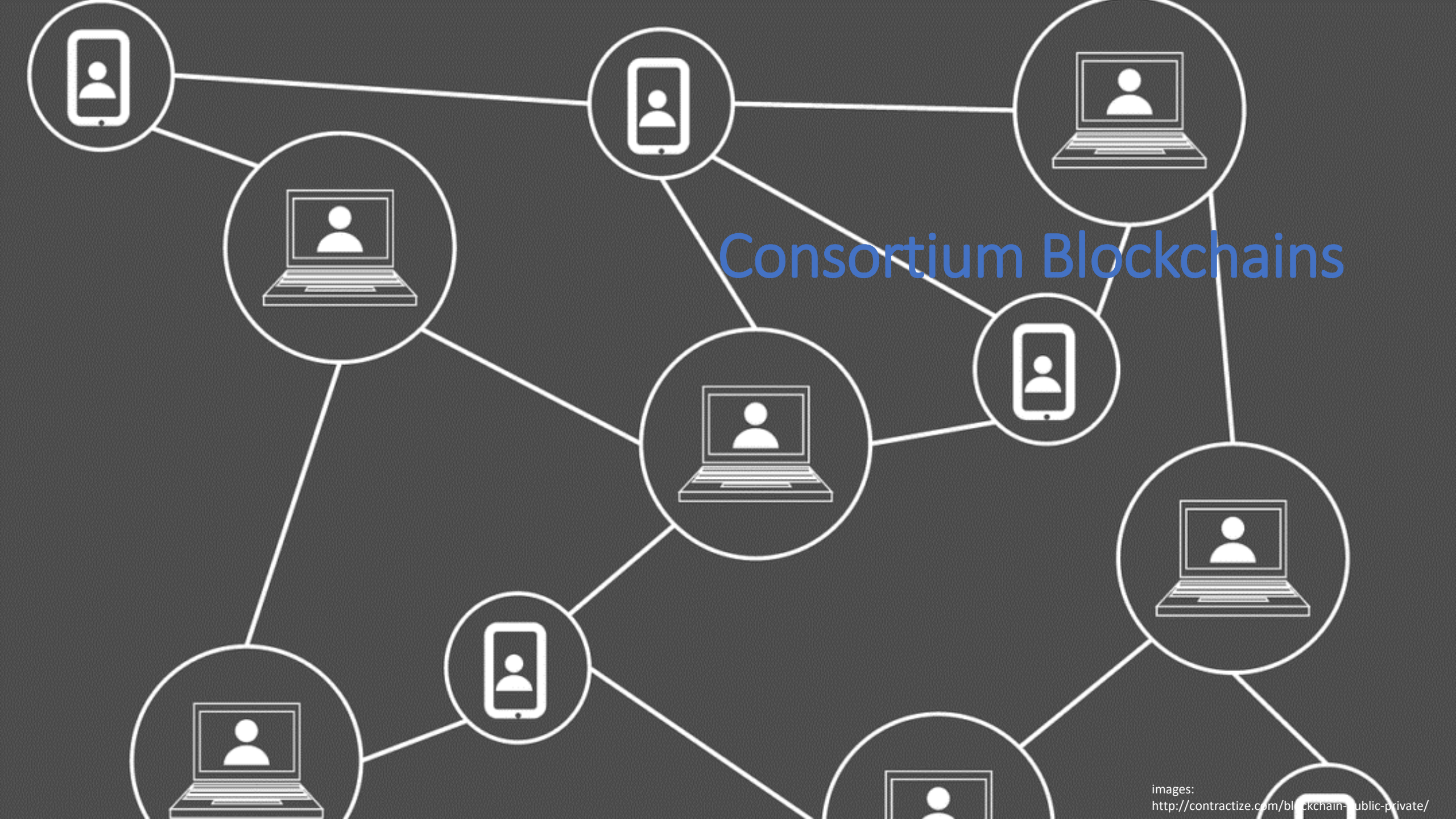
source: https://medium.com/fluree/blockchain-for-2618-and-beyond-a-growing-list-of-blockchain-use-cases-37db7c19fb99

There is large interest in Blockchain **Adoption**, with many projects underway

Maersk	cargo tracking
Port of Antwerp	container handling
Walmart	supply chain transparency
Airbus	jet plane parts tracking
UPS	supply chain transparency
FedEx	customer dispute resolution
Australian Securities Exchange	clearance & settlement
Credit Suisse	syndicated loans
Dubai Land Dept.	land registry



Source: Accenture Research

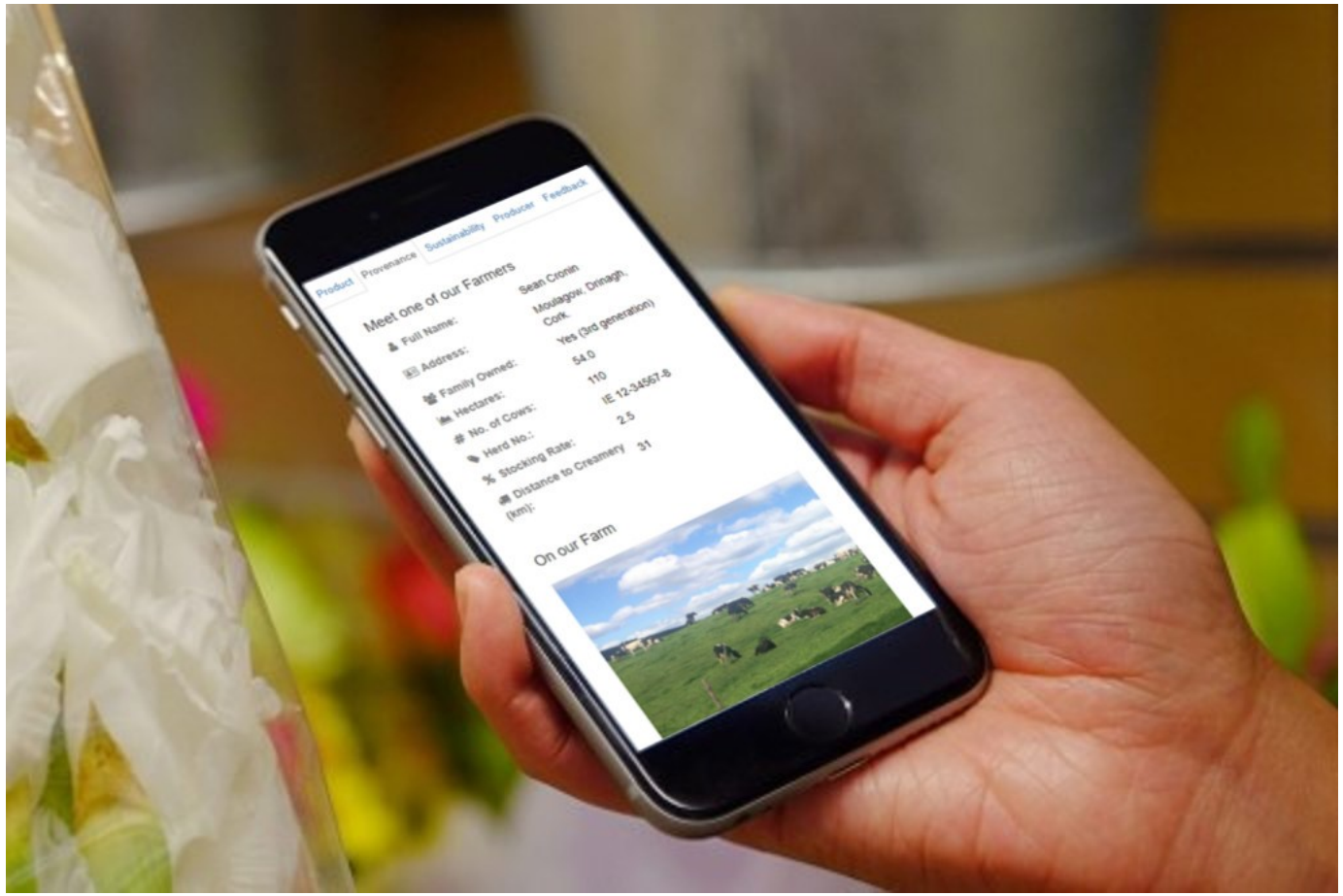


images:
http://contractize.com/blockchain-public-private/

Consortium Blockchains

- Hyperledger
  - Linux Foundation, Open Source
  - Fabric (IBM)
    - Kafka orderer, key-value store
    - Go, Java
    - Federated Channels, Private transactions
  - Sawtooth (Intel)
    - larger networks, PoET
    - transaction families
  - Burrow (Monax)
    - Ethereum fork
    - Tendermint BFT
  - Composer
- Quorum (JP Morgan Chase)
  - RAFT, Istanbul BFT
  - Ethereum fork
  - Privacy, Confidentiality

Shameless Plug:
Clárú is bringing **Traceability** to the Irish **Dairy** Sector



2) Meetup Consensus

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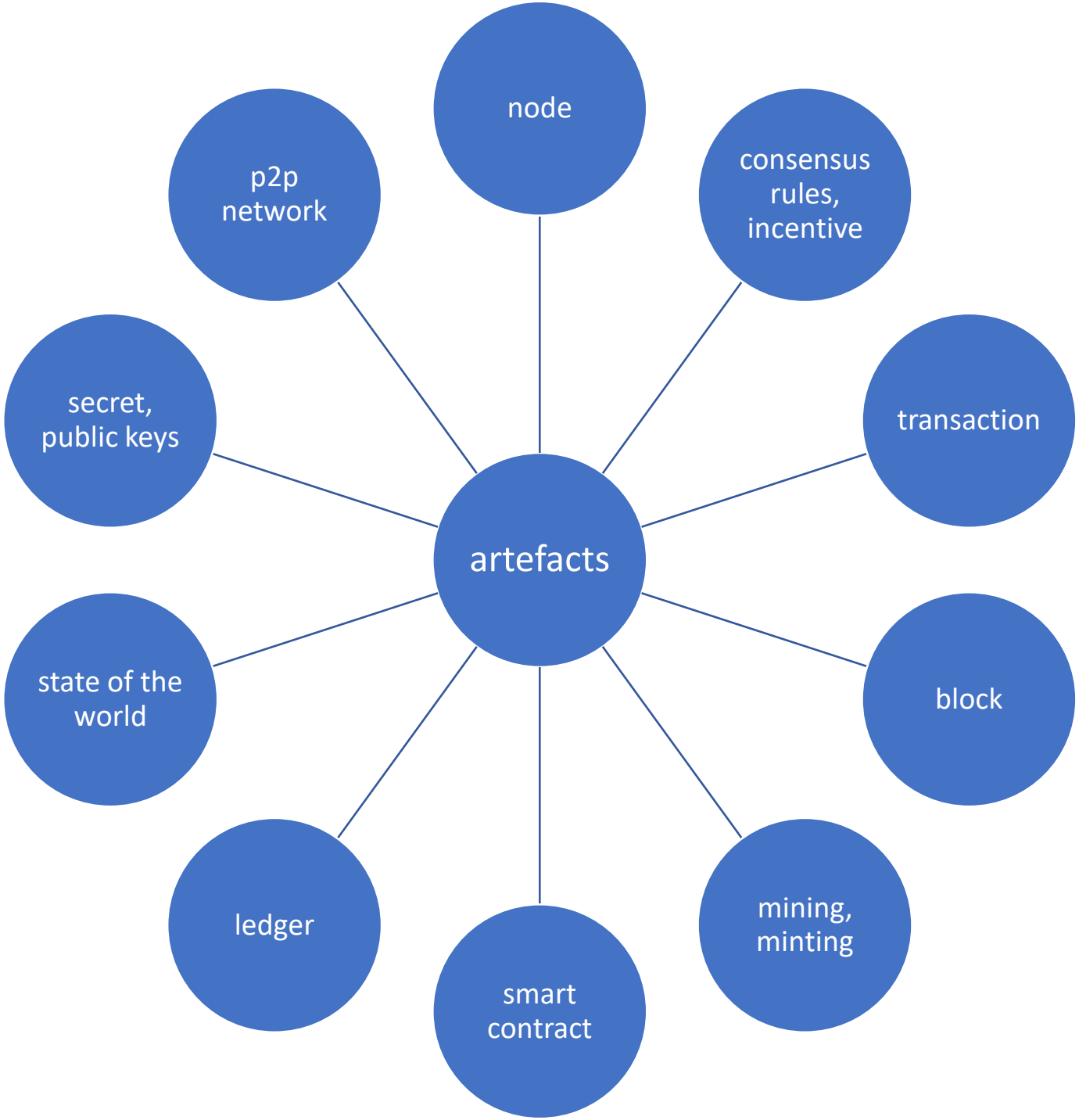
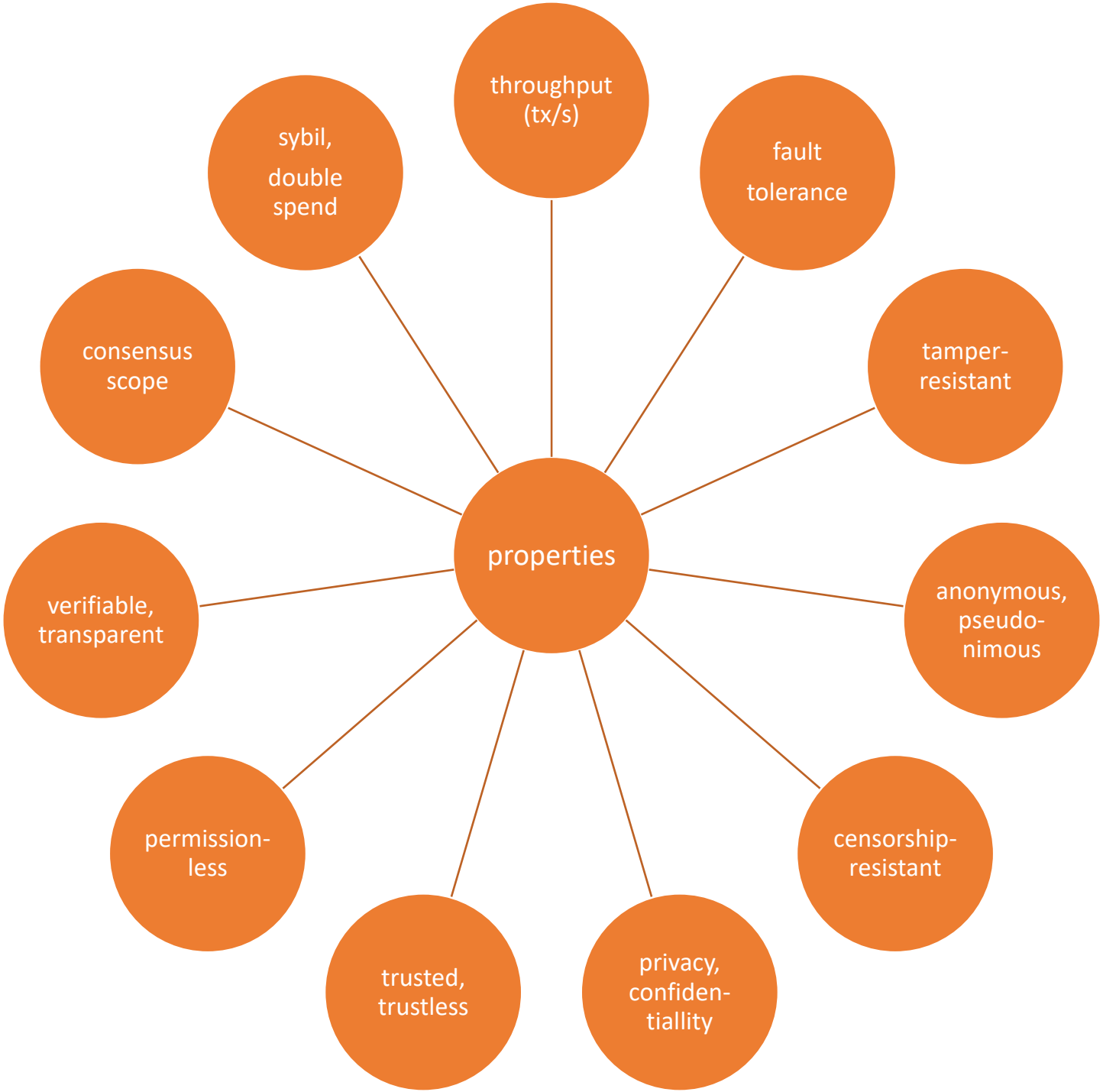
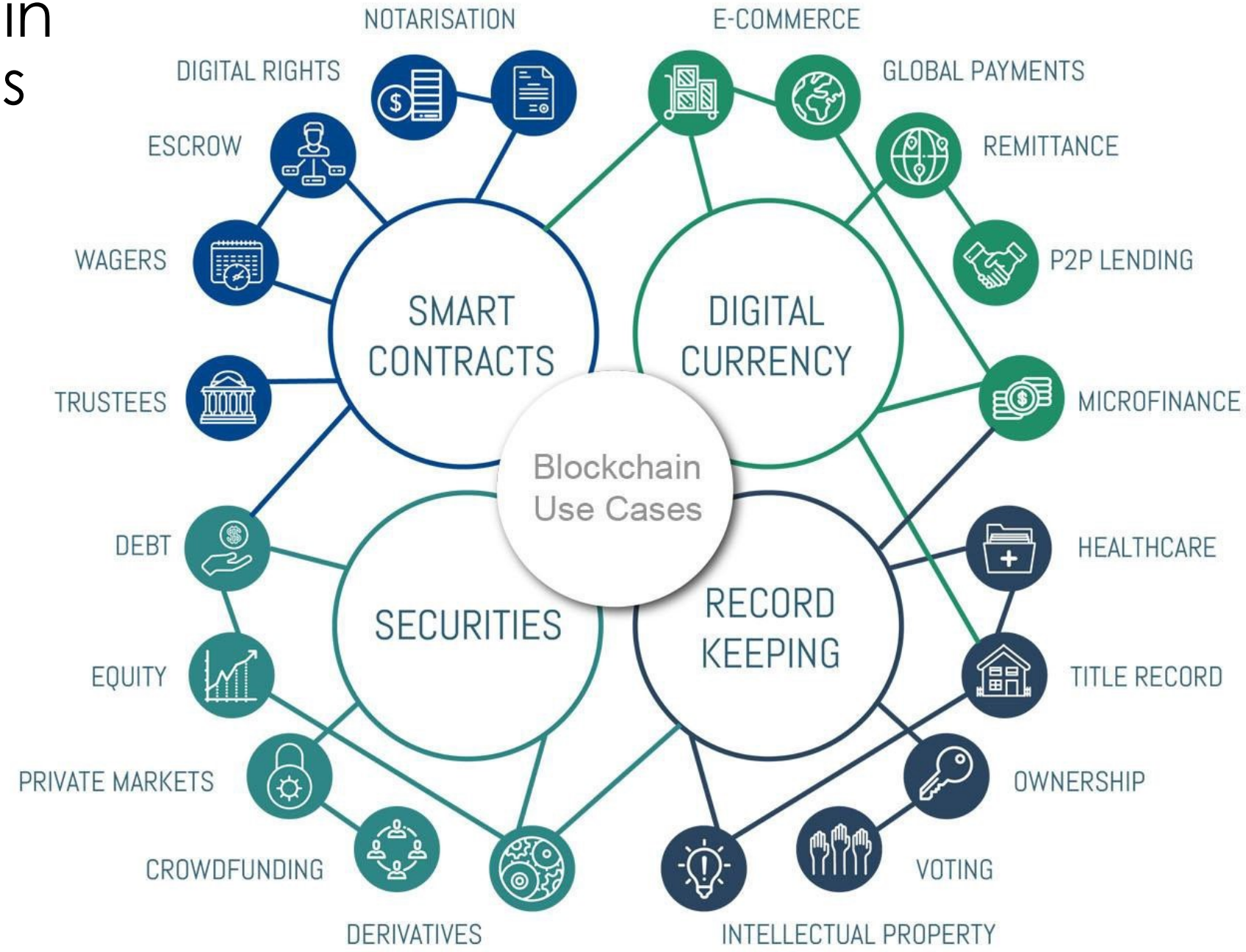
Blockchain Artefacts



Blockchain Properties

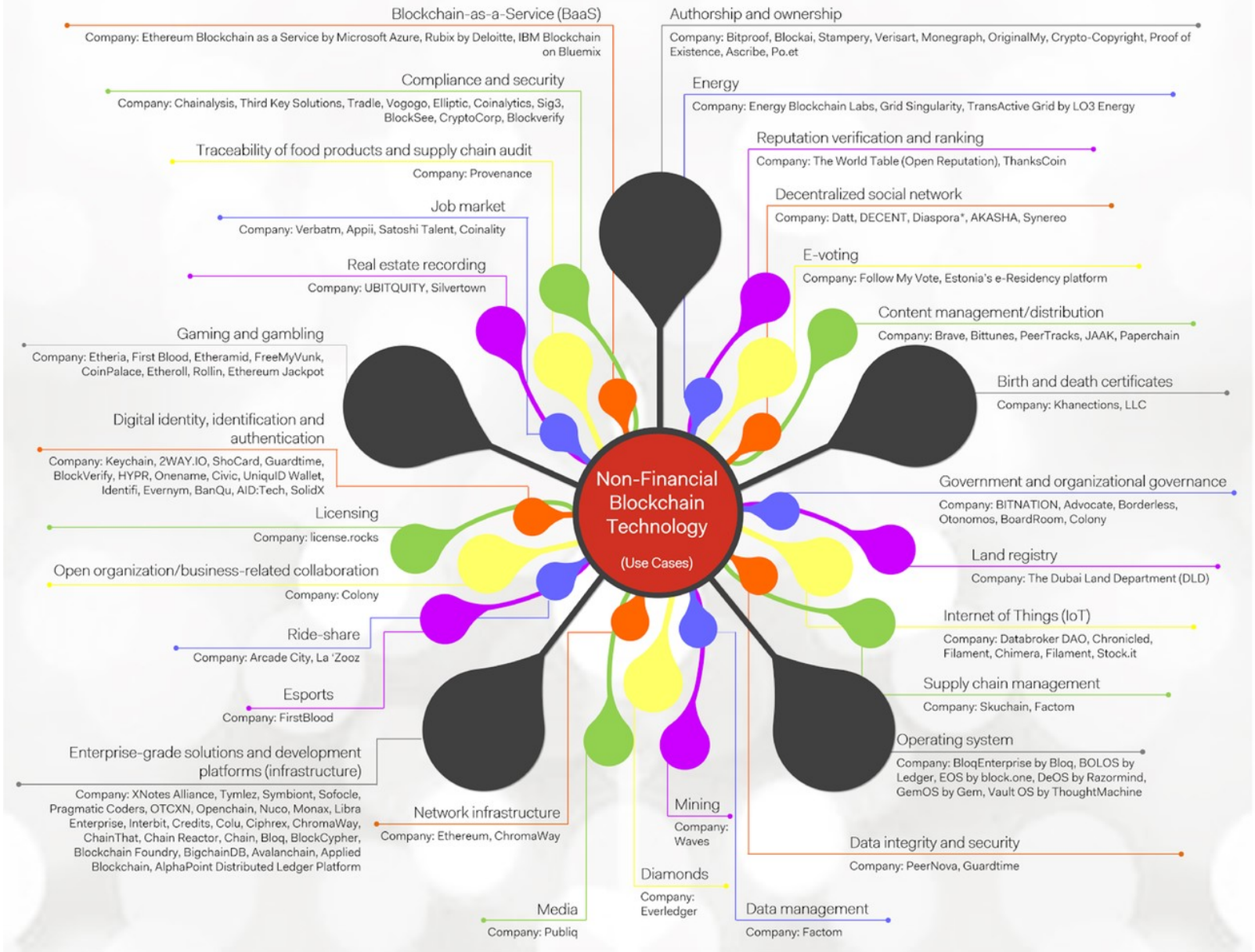


Blockchain Use Cases



https://medium.com/@sergiomarrero/6-emerging-categories-for-blockchain-use-cases-4650f824d130

30 Non-Financial Use Cases of Blockchain Technology



https://gomedici.com/30-non-financial-use-cases-of-blockchain-technology-infographic/

Do you want to know more?

- Meetup: Cork Blockchain
- Slides, Material on corkblockchain.com
- Upcoming "Blockchain in Practice" Event at UCC, date TBD => claru.io
- Good MOOCs
  - Coursera (Bitcoin and Cryptocurrency Technologies)
  - University of Nicosia (DFIN-511 Introduction to Digital Currencies)
    - Also offer MSc Digital Currencies

Thank you,
any questions?