

Blockchain & Distributed Ledgers

Teagasc - Agriculture and Food Development Authority

2018-03-21

Johannes Ahlmann, CTO

Johannes.Ahlmann@ilen.io

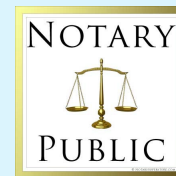


ilen.io

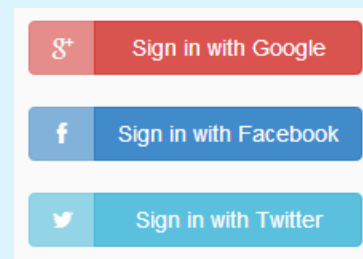
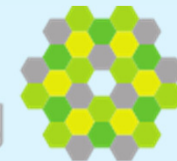
When we interact/transact with others,
we often delegate **Trust** to **Intermediaries**

producer,
provider,
seller,
lender

PADDYPOWER.
Ladbrokes



Land
Registry



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



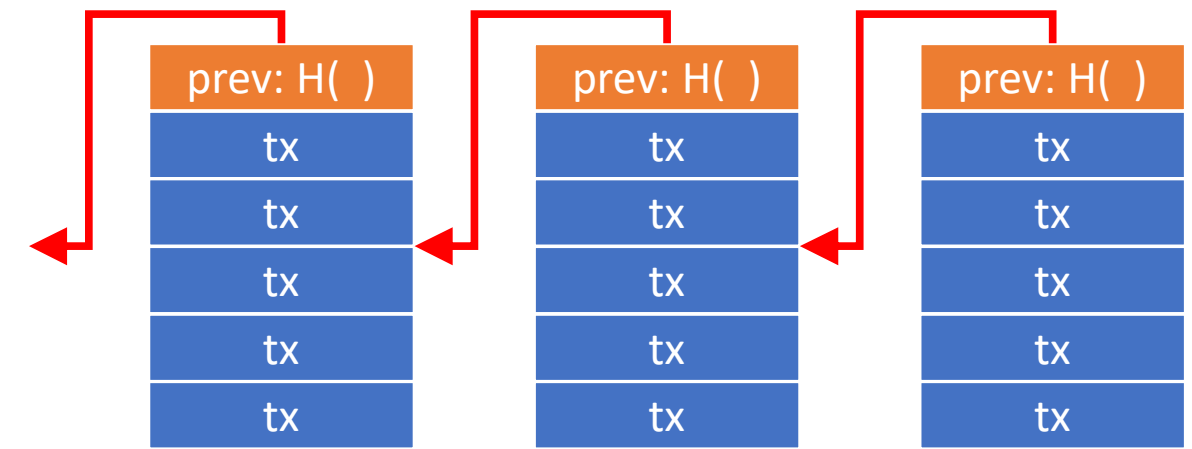
sources:

<https://commons.wikimedia.org/wiki/File:Server-based-network.svg>

http://www.gjermundbjanes.com/img/posts/distributed_ledger.png

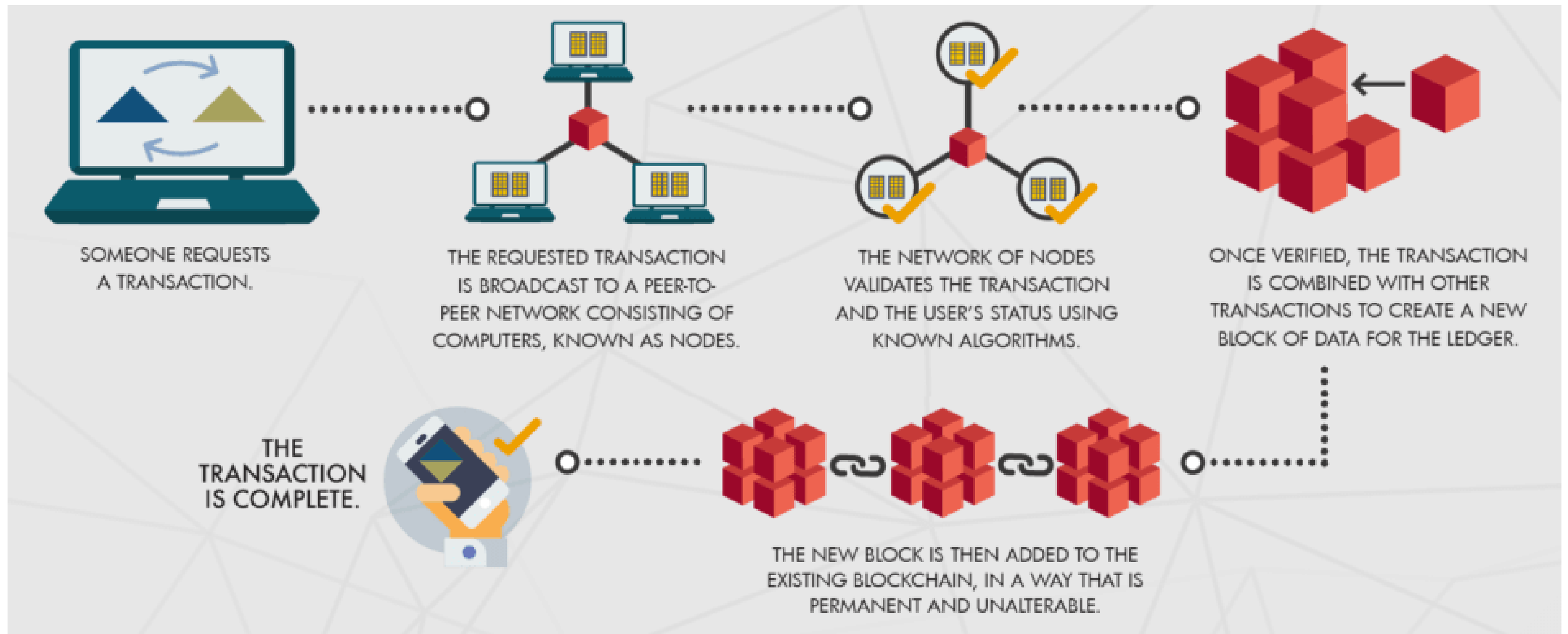
How can we achieve a shared, trusted Ledger **without Trust between Parties?**

- Block = List of Transactions
- Blockchain = Chain of Blocks
 - Tamper-Proof
- Consensus (PoW)
 - Miners expend energy to find hash puzzle solution (fair lottery)
 - "block reward" = 12.5 BTC ~ 90,000€
 - Other nodes accept block if it is valid
- Trustless
 - Nodes assumed to be untrusted
 - Fair Lottery, Cryptography ensure that no one can cheat

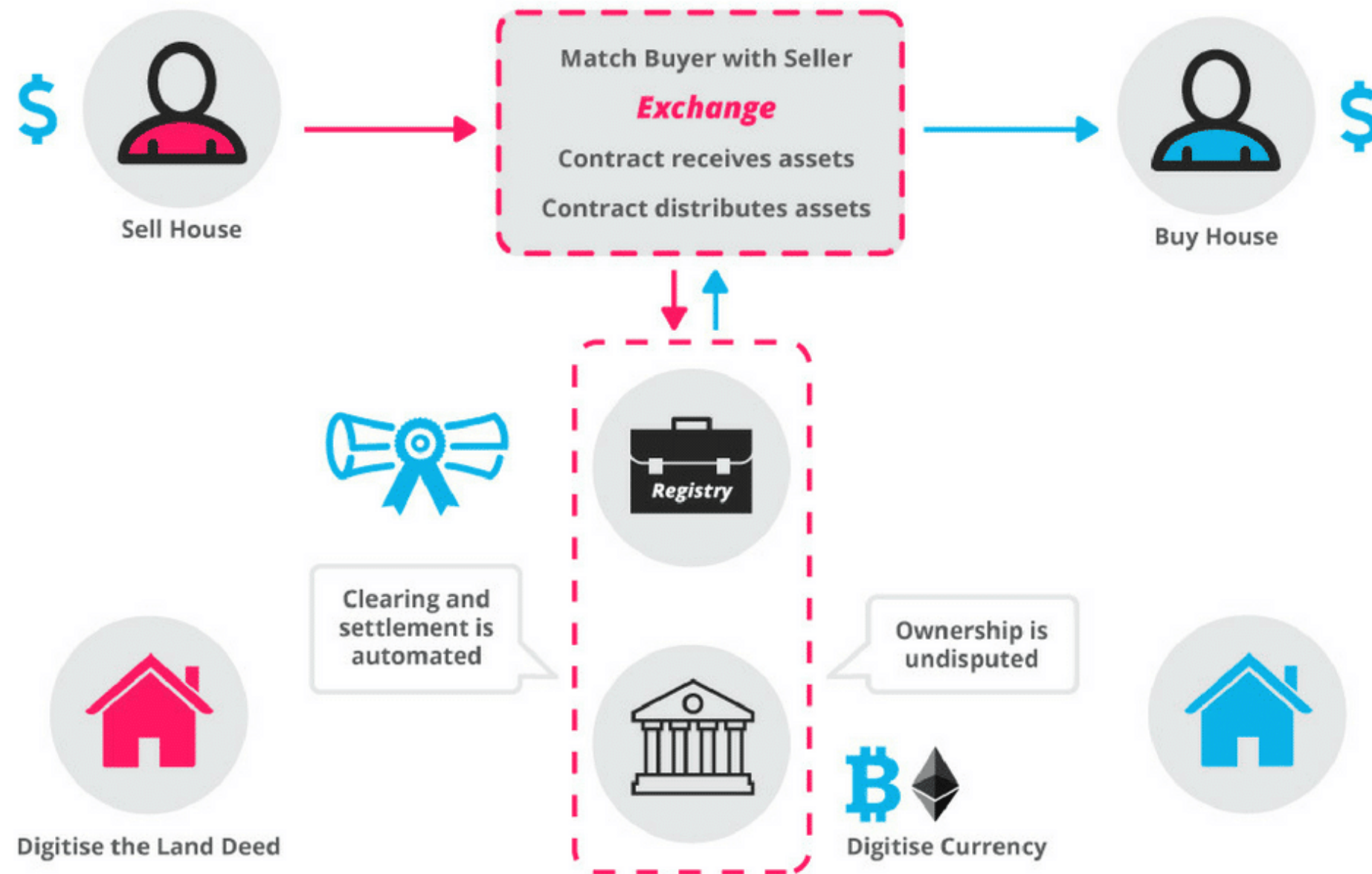


source: <https://medium.com/@brettking/abc61b2ab49a>

A day in the life of a Blockchain **Transaction**



Smart Contracts enable more complex, stateful Transactions with multiple Participants over Time



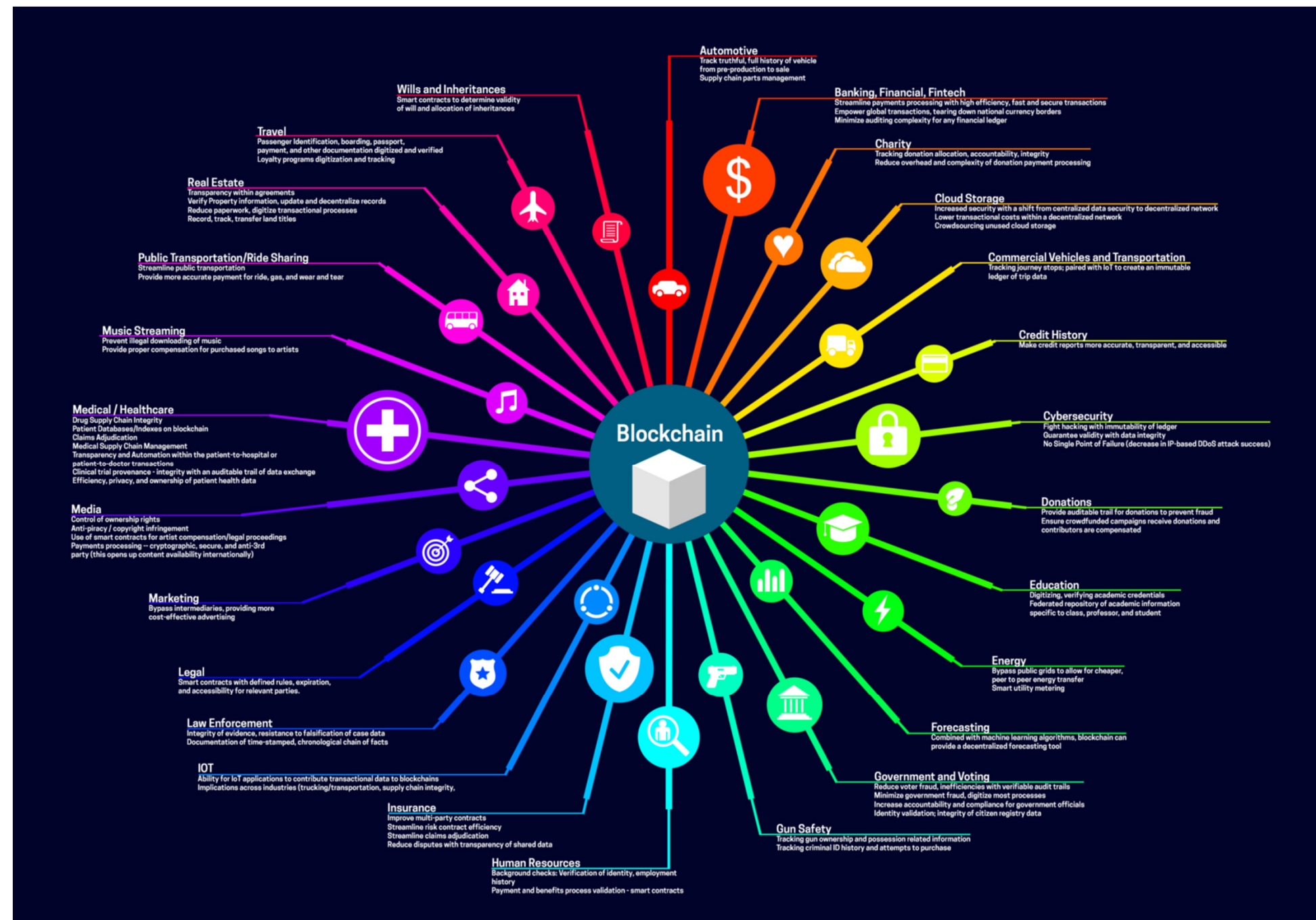
A Consortium Blockchain can address some Challenges Companies may find with Public Blockchains

- 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?

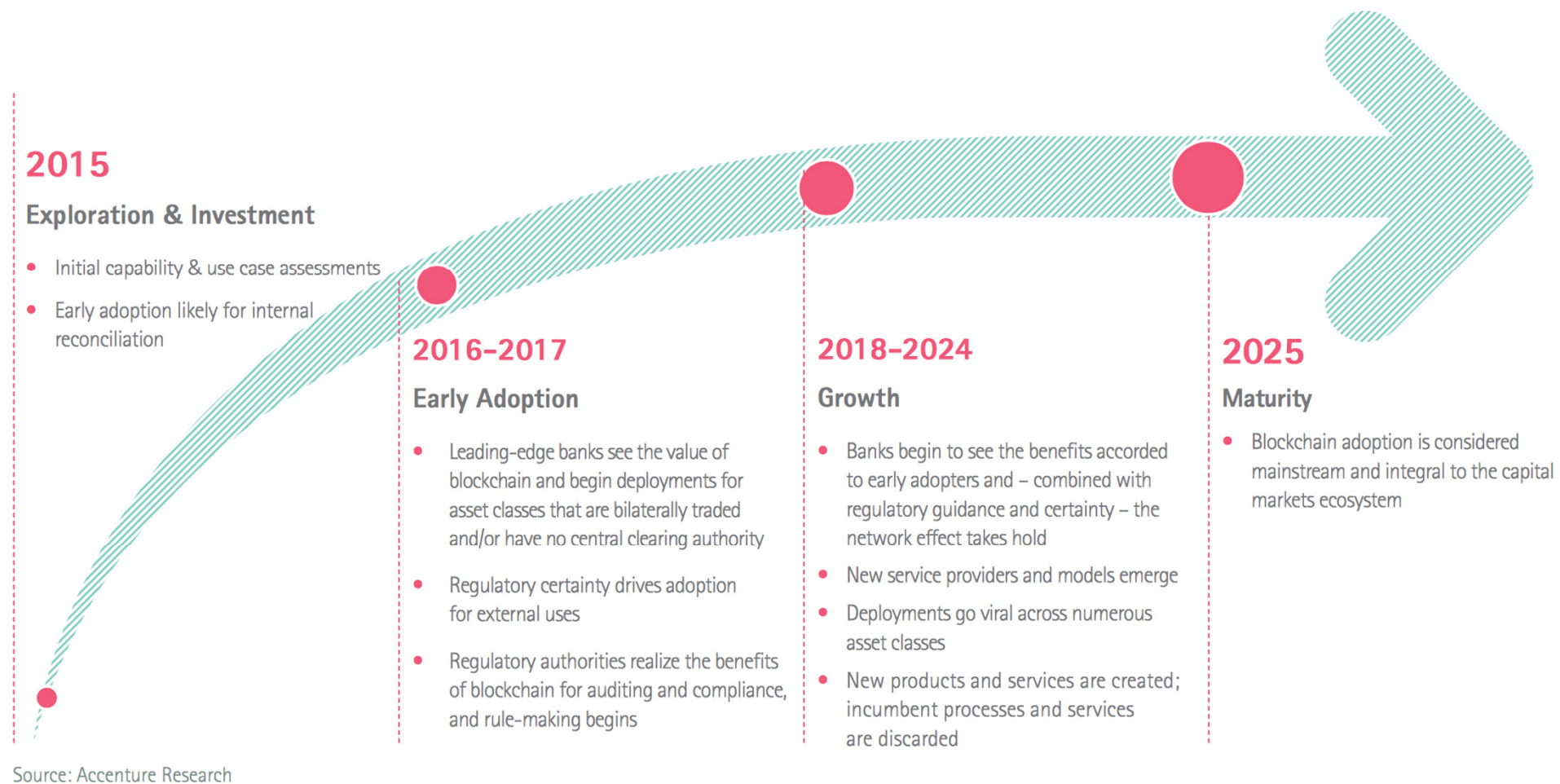
- Data Exchange between multiple parties
- End-to-End Supply Chain Transparency
- Product Traceability
- Marketplaces, Trading
- Clearance & Settlement
- Public Registries



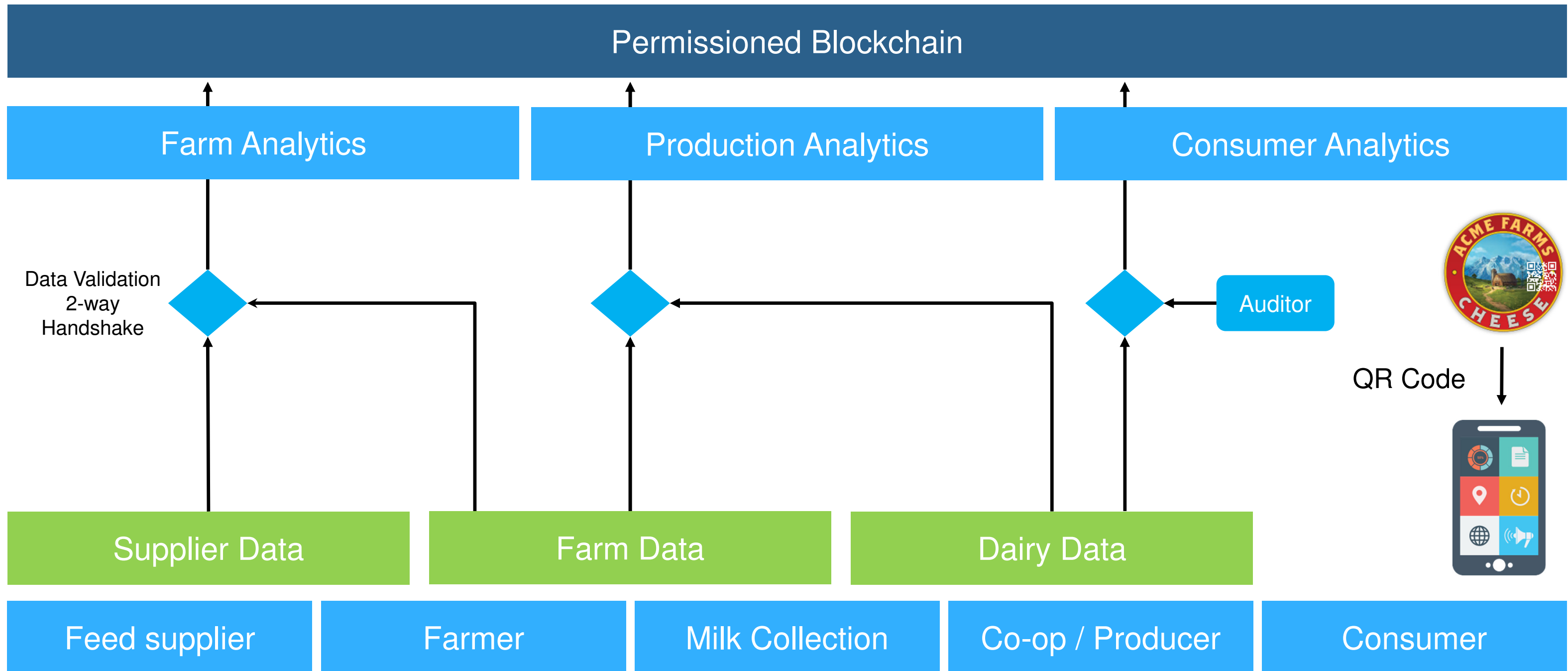
source: <https://medium.com/fluree/blockchain-for-2018-and-beyond-a-growing-list-of-blockchain-use-cases-37db7c19fb99>

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



iLen is bringing **Traceability** to the Irish **Dairy** Sector



**Thank you,
any questions?**