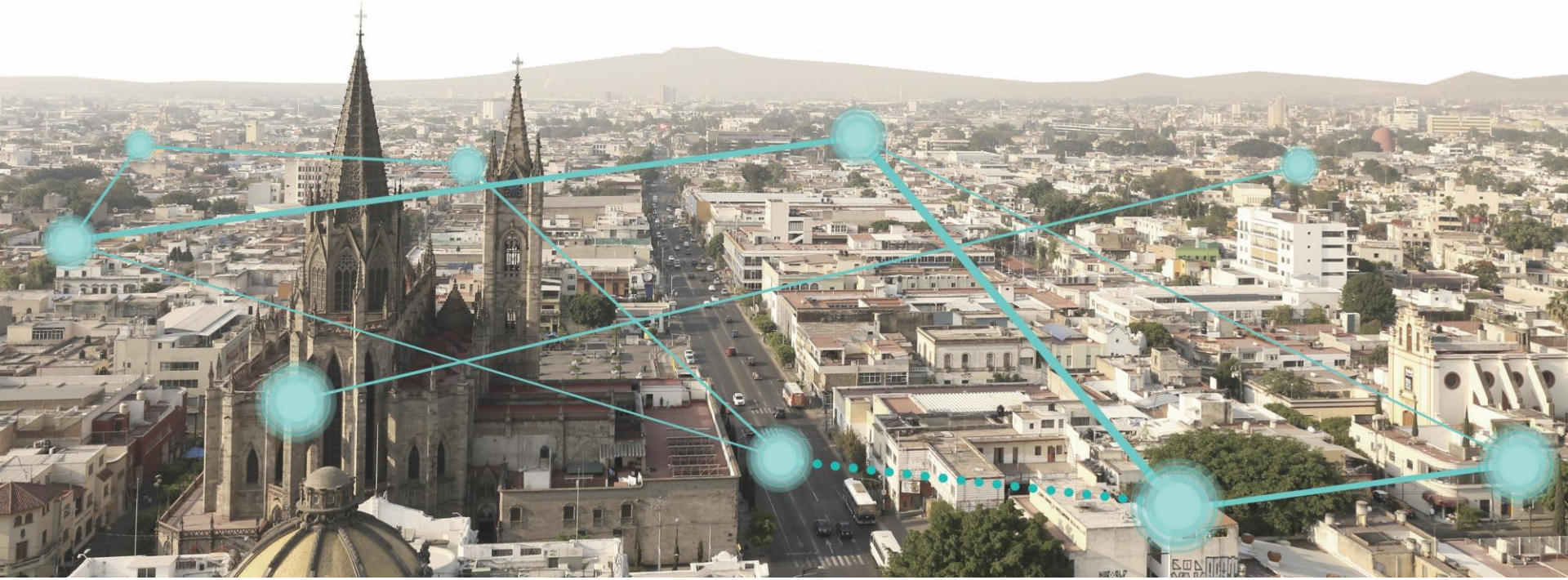
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Blockchain as a game changer in the energy sector?

Viktor Peter | Blockchain Governance Expert | GIZ Blockchain Lab



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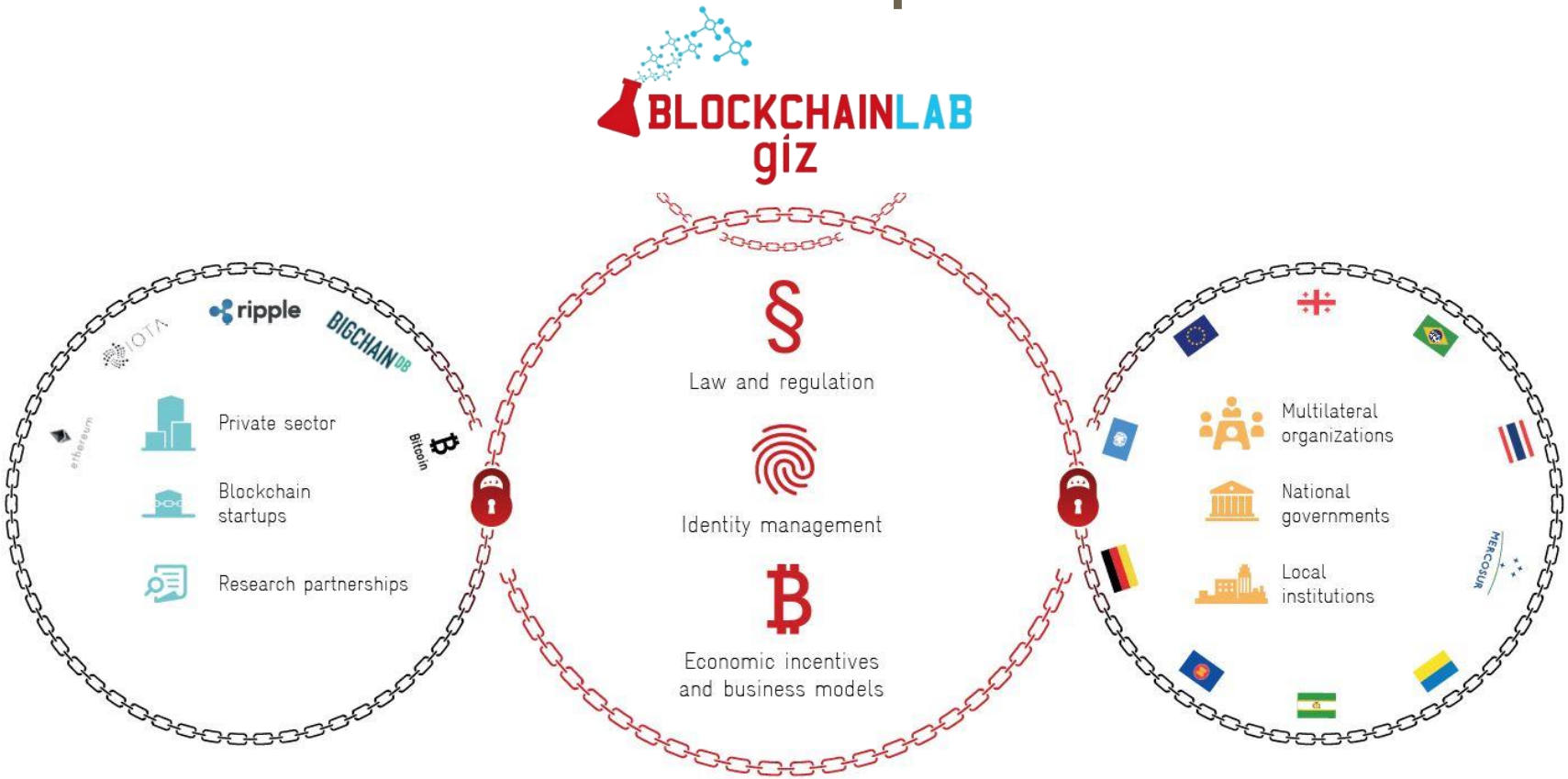
BLOCKCHAINLAB giz

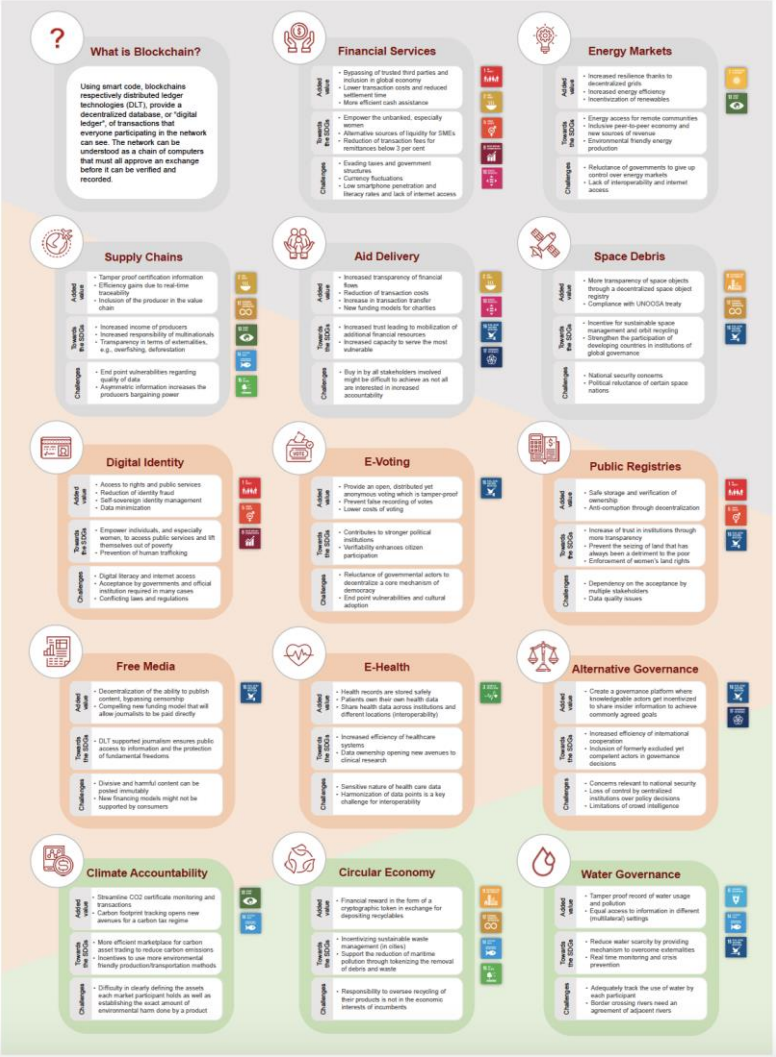
GIZ Blockchain Lab as an „honest broker“ in the blockchain space



The missing link in the chain between bits and atoms

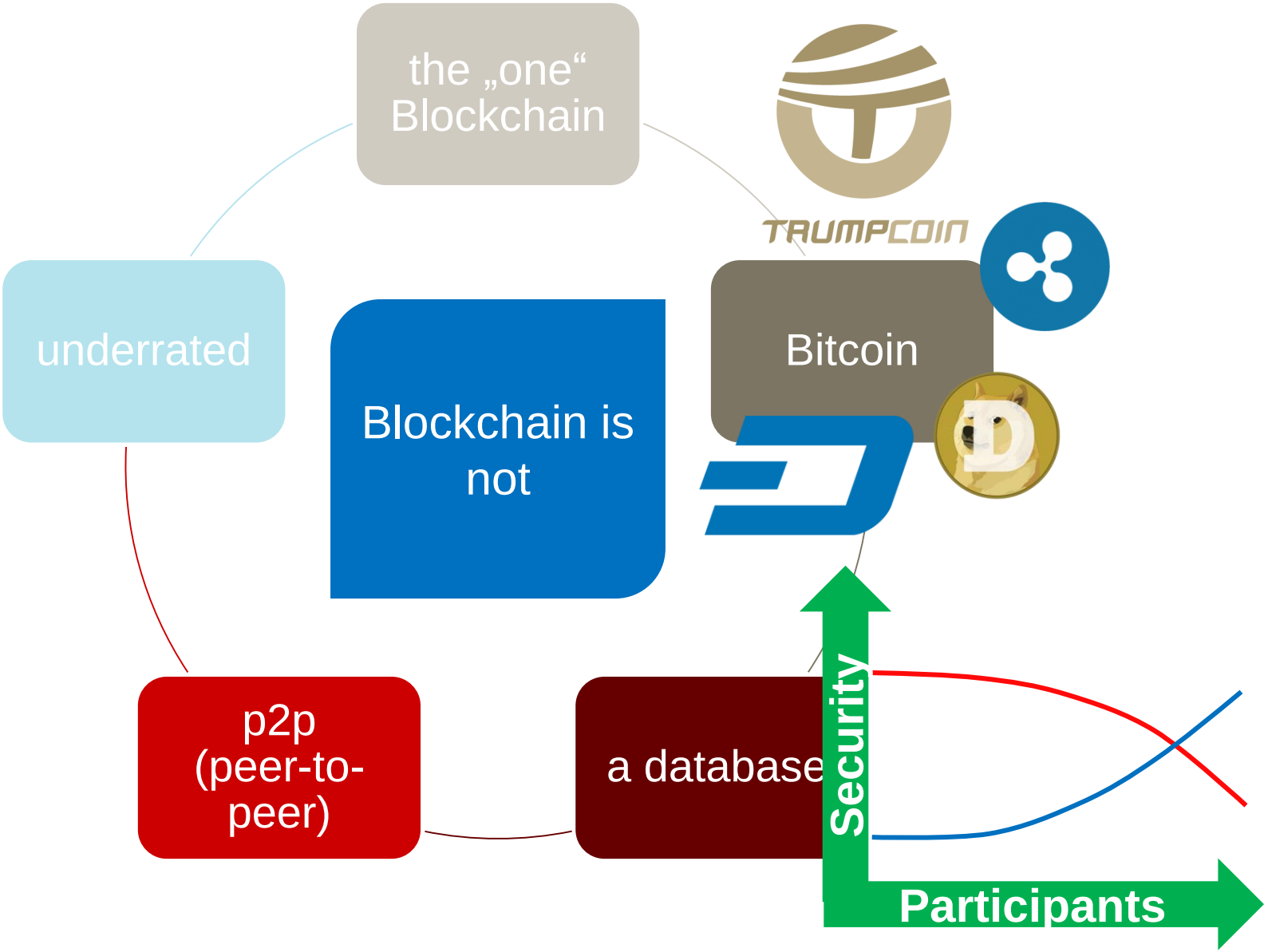
Blockchain use cases for sustainable development

Towards finding facts among dreams and fears and separating the hype from the substance.



An introduction to blockchain

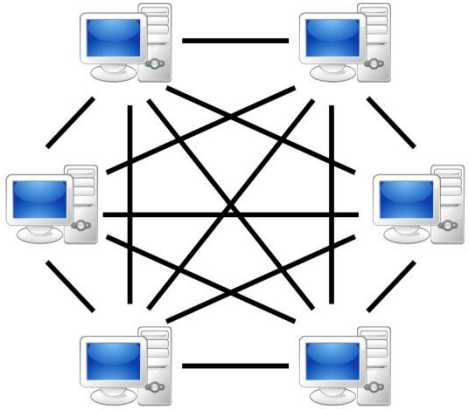
Misconceptions about Blockchain



Data (-transactions) without DLT

Data (-transactions) with DLT

What are the technologies behind Blockchain?



P2P-network

Database/ ledger technologies

+

P2P-Networks

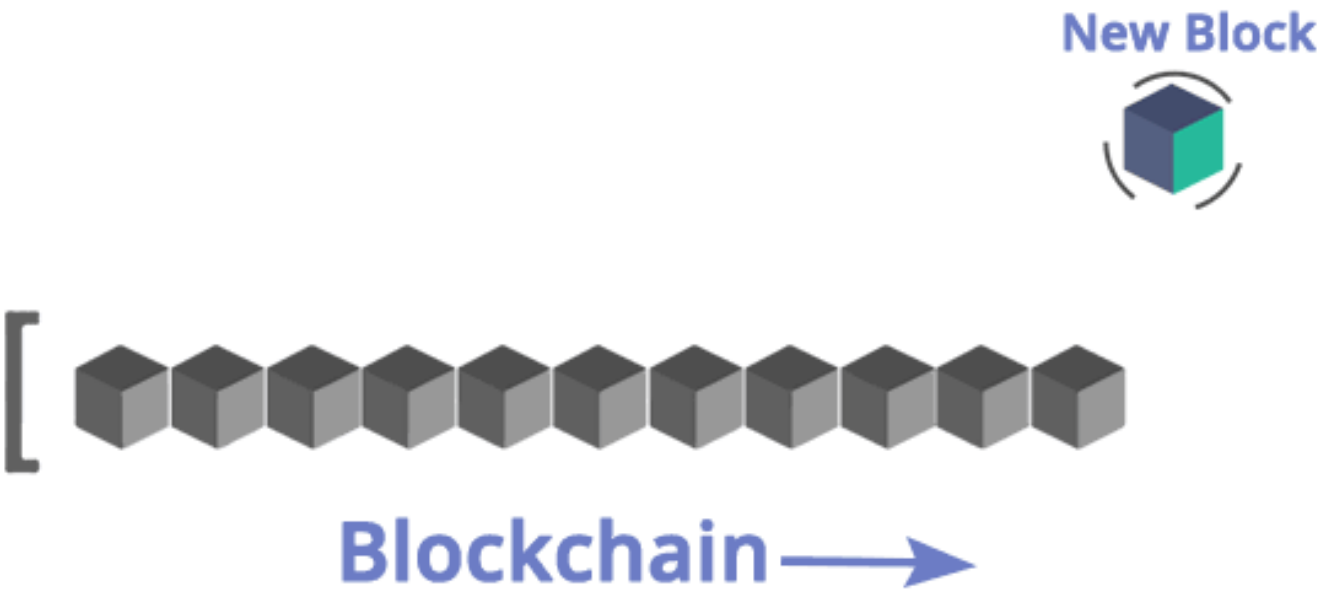
+

Cryptography

=

Blockchain

What is a blockchain?



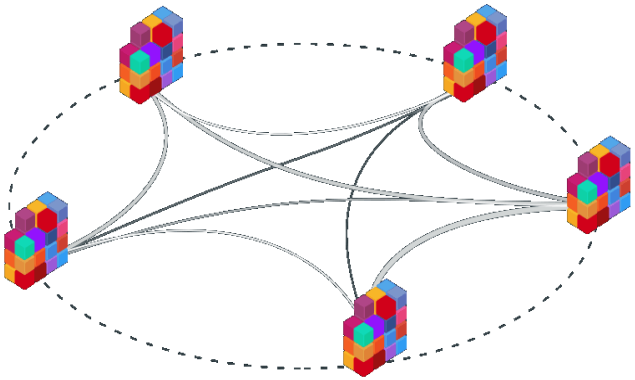
Actors within DLT - simplified

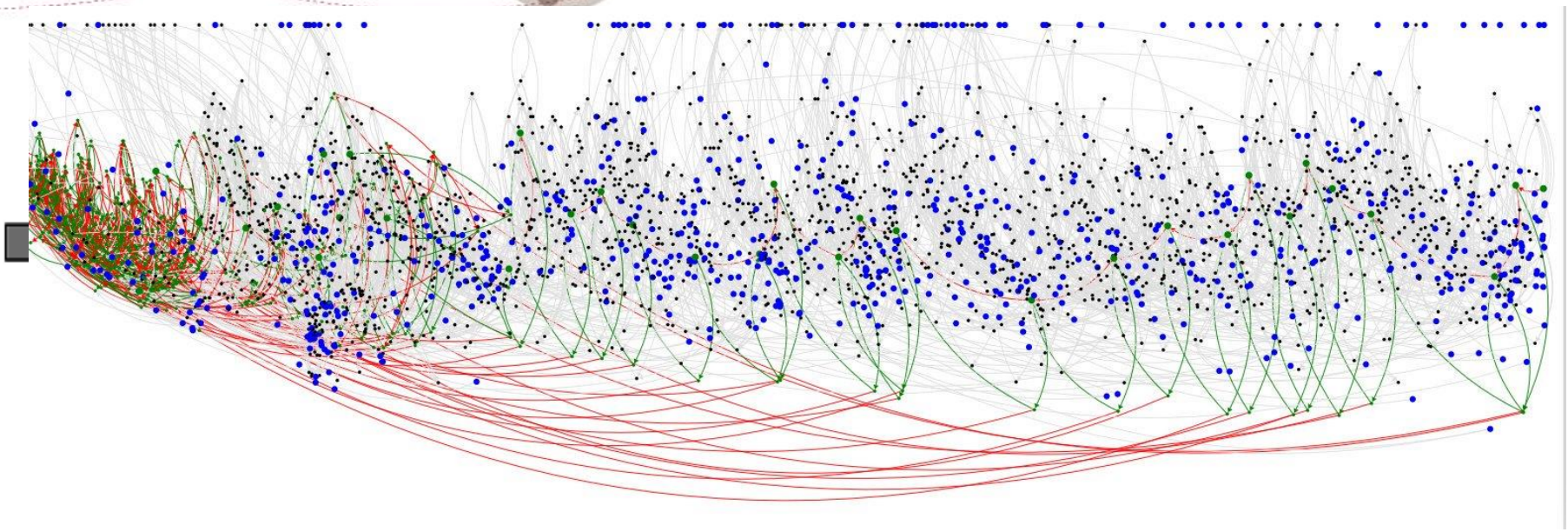
	User	Node	Miner
Engage transactions	✓ (indirect via Nodes)	✓ (direct)	✓ (generally possible)
Possesion of the whole data log	✗	✓	✓
Check transactions (cover, signatures, etc.)	✗	✓	✓
Put transactions in Blocks, calculate hashes, **generate Blocks**	✗	✗	✓

Public, private and federated DLT - simplified

Private DLT	Federated DLT	Public DLT
Velocity Governance Known Identities		Security Resilience Pseudonomity

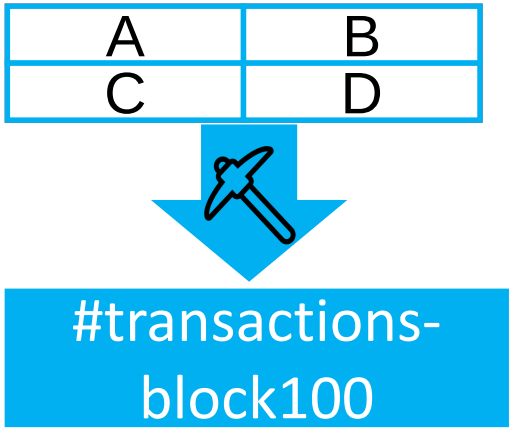
- **Blockchain 2.0: "Bringing intelligence, applications and automation into the blockchain".**
- Not only the presentation of financial information, but also meter readings, certificates, ...
- Smart Contracts: if-then-relationships, which are recorded in the blockchain
  - If the temperature in room xyz exceeds 25 °C, then air conditioning abc is turned on.

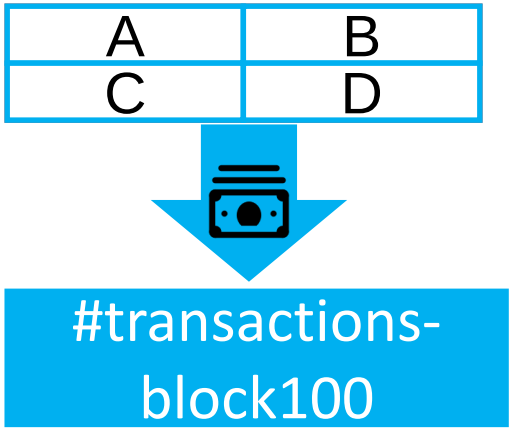


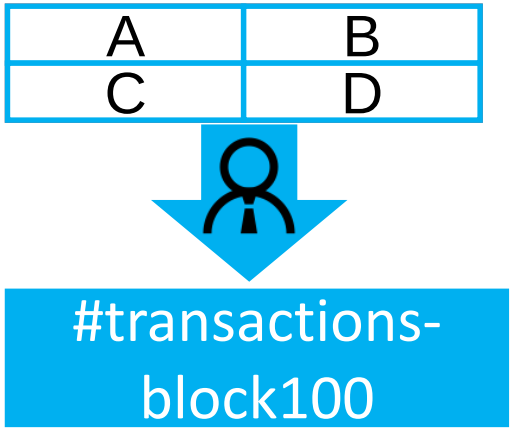


- **IOTA: Blockchain without blocks**
  - "Operating System of the Internet of Things."
  - Improve scalability
  - No transaction costs
  - Increase transaction speed

Consens mechanisms in blockchains







Proof-of-Work:
"I worked to validate the transaction. I was faster and therefore better than my competitors. The solution is right and I get money for it. Why shouldI create a wrong or manipulated block? Then I wouldn't earn anything from my work."

Proof-of-Stake:
"I have invested a lot in this blockchain, its continued existence and functionality are important to me. I will build you a new block and vouch with my assets invested in this blockchain for the correctness. If the block is wrong or manipulated, I lose my stake."

Proof-of-Authority:
"In the conception of this blockchain, I was set as the authority. You know me and trust me. So why should I create manipulated blocks?"

Blockchains

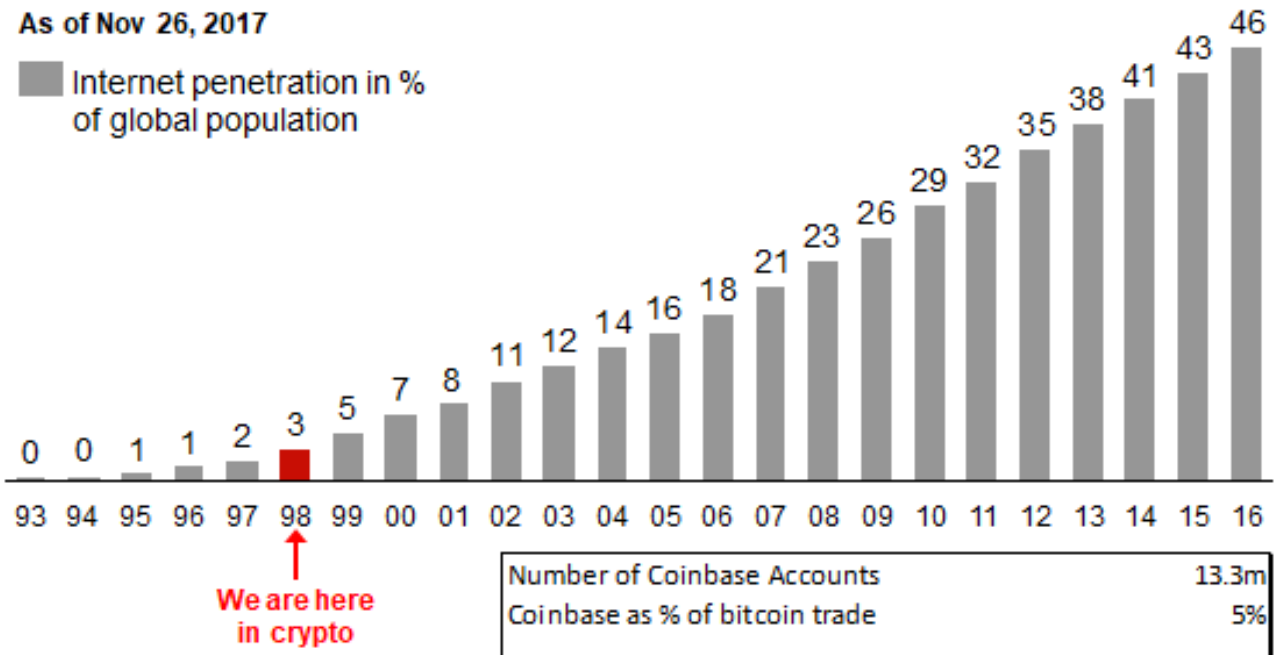
An innovative IT-solution to transform the way we handle data

A blockchain is a constantly growing **list of transactions** which are **stored in blocks** and are secured through **cryptography.** A **decentralized network of computers** is processing, verifying and validating all entries.

Promises of DLT-solutions

- **Transparency**: Traceability of transactions
- **Disintermediation:** „Creating trust through technology, not through authority“
  - Crypto-economics: incentive structures and game theory as a vehicle for new forms of collaboration
- **Resilient and secure IT-infrastructure**
- **Inclusion:** lowering potenital entry barriers
- **Automation** of contracts or processes (process efficiency)

Cryptocurrency adoption: Just getting started



Number of Coinbase Accounts	13.3m
Coinbase as % of bitcoin trade	5%
Implied # of total crypto exchange accounts	266m
Assumed # of accounts / household	4
Total number of unique crypto Households	**66.5m**
As % of total world wide households	**3.5%**

Sources:
- internetlivestats.com
- Coinbase data (@alistairmilne on Twitter)
- Wikipedia Household information

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Thank you!

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