
BLOCKCHAIN

Technologies, Research Questions and Applications

ERCIM, 23. May 2017

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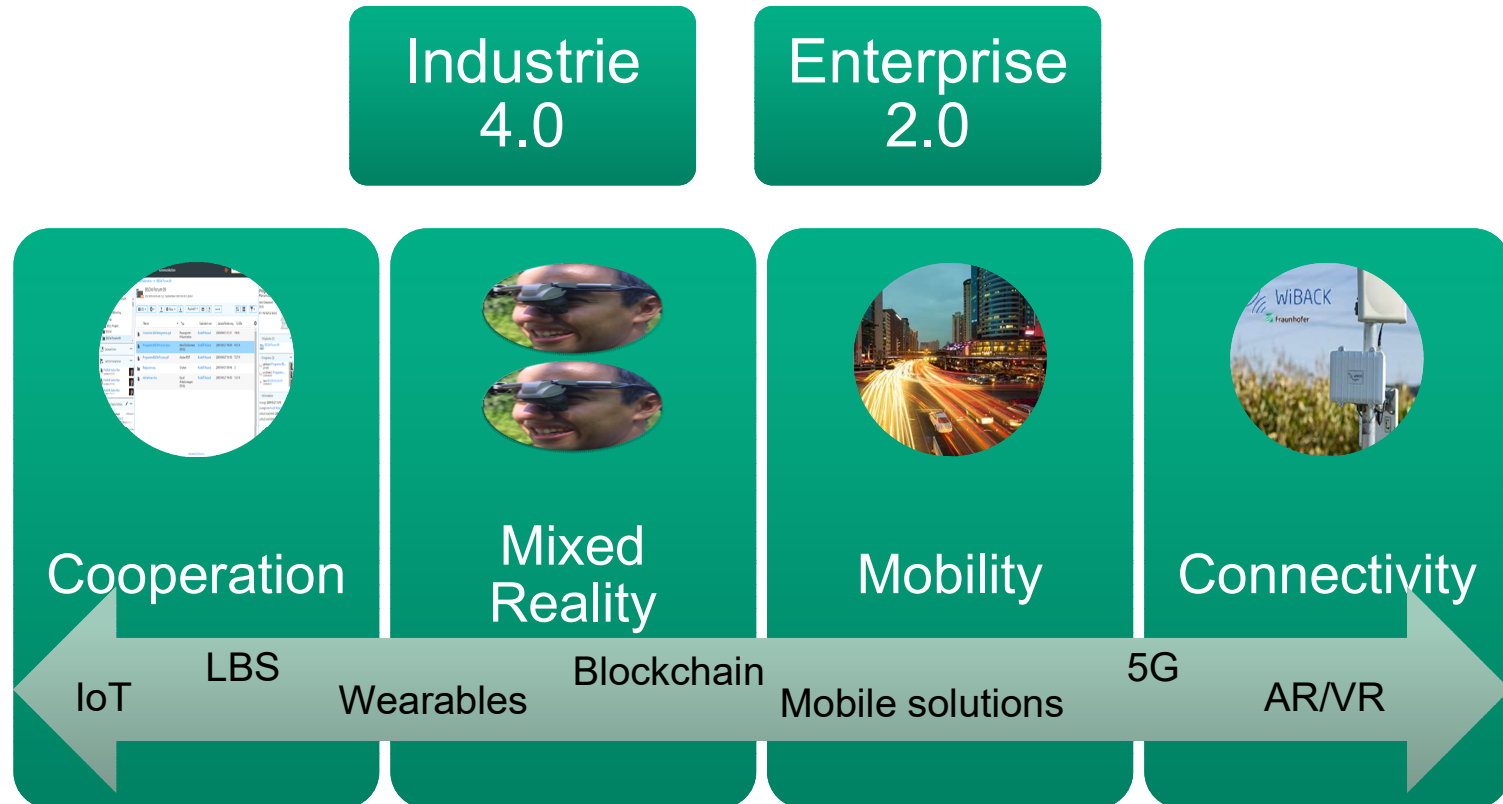


INSTITUTS OF THE FRAUNHOFER BLOCKCHAIN COMMUNITY



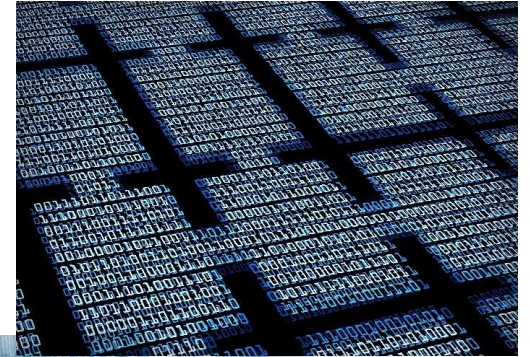
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Cooperative solutions for the challenges of digitization



What makes the technology attractive?

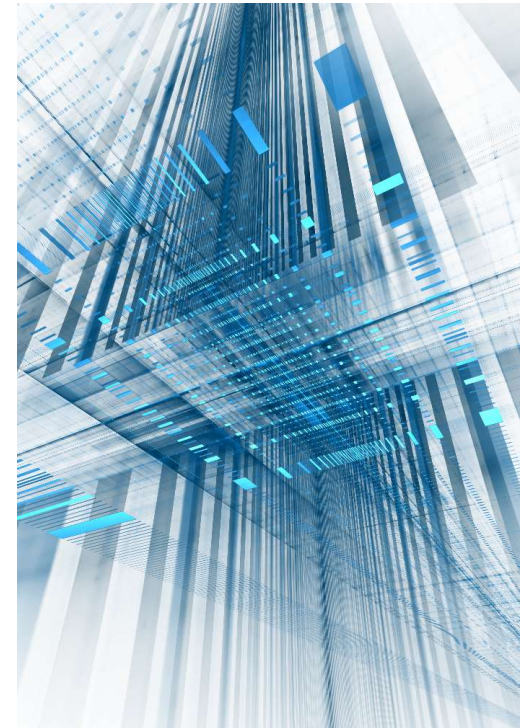
- Distributed consensus building in a network
 - no central instance
- Representation and transfer of value and rights
- Comprehensible and irreversible protocol of transfer
- Automatisations potential by smart contracts



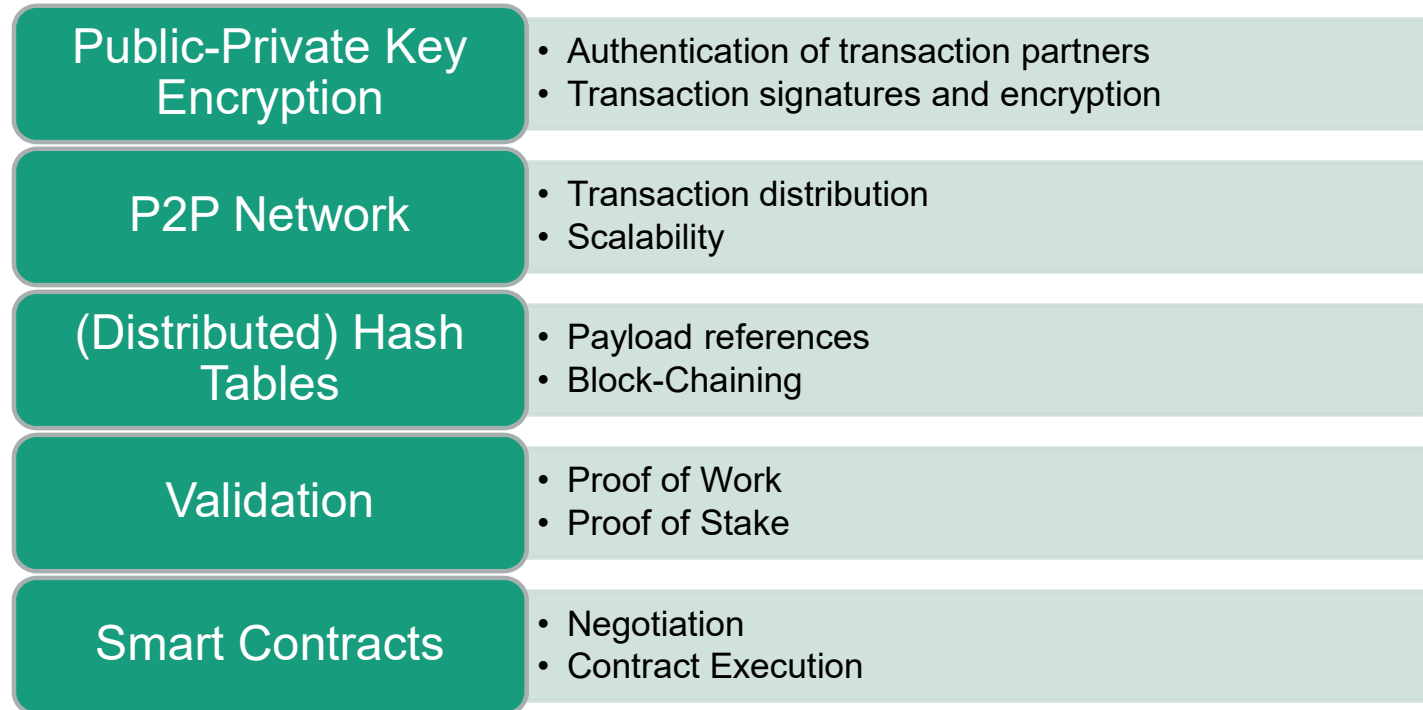
Blockchain as the basis for the 4. Generation of the Internets of Value

Blockchain unchained – The Blockchain-Research Landscape

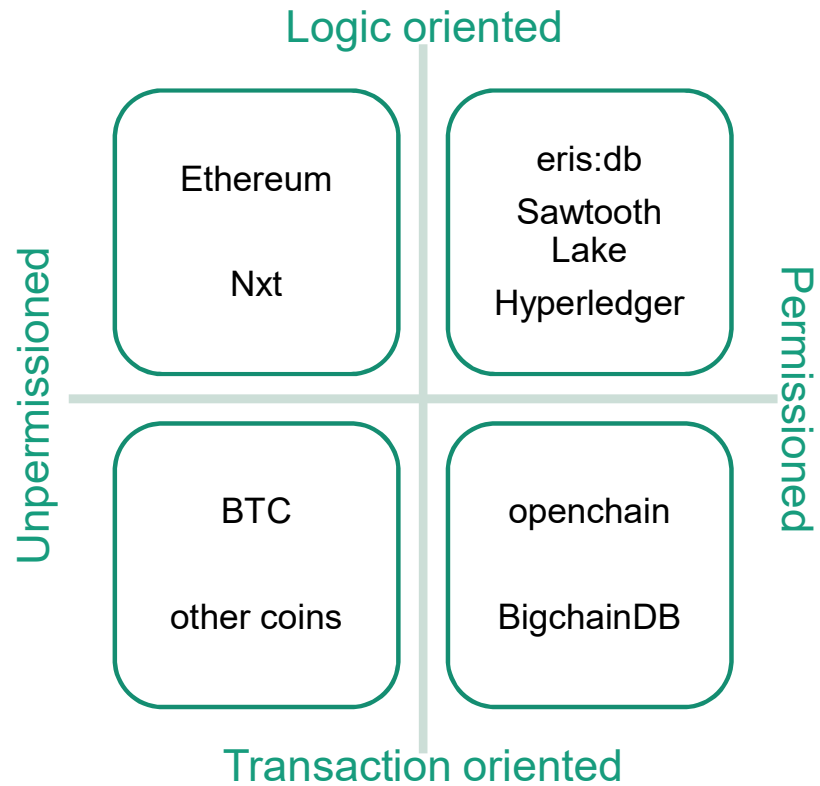
- **P2P-Network**
 - Consistency and integrity of the nodes
- **Distributed systems**
 - scalability
- **Cryptographie**
 - Crypto-Agility
- **Consensus building and validation**
 - **Proof-of-xxx: Use Case, Scalability and security**
- **Smart Contracts**
 - Software-Lifecycle
- **Business models**
 - What are suitable business models and hwo to find them?



Building blocks of a Blockchain



Blockchain *Design Space*



Application areas

- **Internet of Things**

Automated contracts and payments

- **Smart Grid**

Comprehensible transactions and automated trade

- **Proof of origin**

Irreversible documentation and proof of constraints

- **Supply Chain**

Autonomous decisions and transactions

- **Darknet**

Transaction forensik



Application business areas

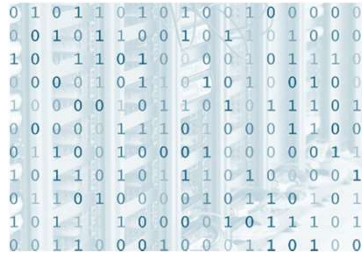
- **Finance**
Process optimization and compliance in transactions
- **Media Industry**
Shared, transparent storage of content and licences
- **Public sector**
Register and transactions, digital identity
- **Legal sector**
new types of contracts and cost reduction for micro-payments
- **Medical areas**
Decentralised documentation and role based access



Is this technology relevant? How to find the right business case



Intermediates



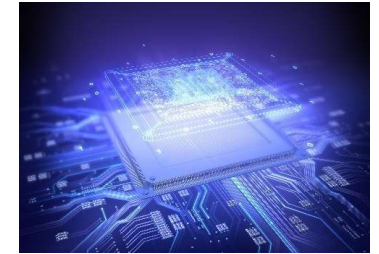
**Datas and
Prozessintegrity**



**Decentralised
network**



**Transfer of values
and rights
ensurements**



Automatization

Research Questions – Discussion Points

- ERCIM Blockchain Infrastructure
- A Blockchain Building Block Ecosystem (e.g. LAMP)
- Smart Contract Library
- Legacy System Integration
- Agile Development and Software Lifecycle vs irreversible Smart Contracts