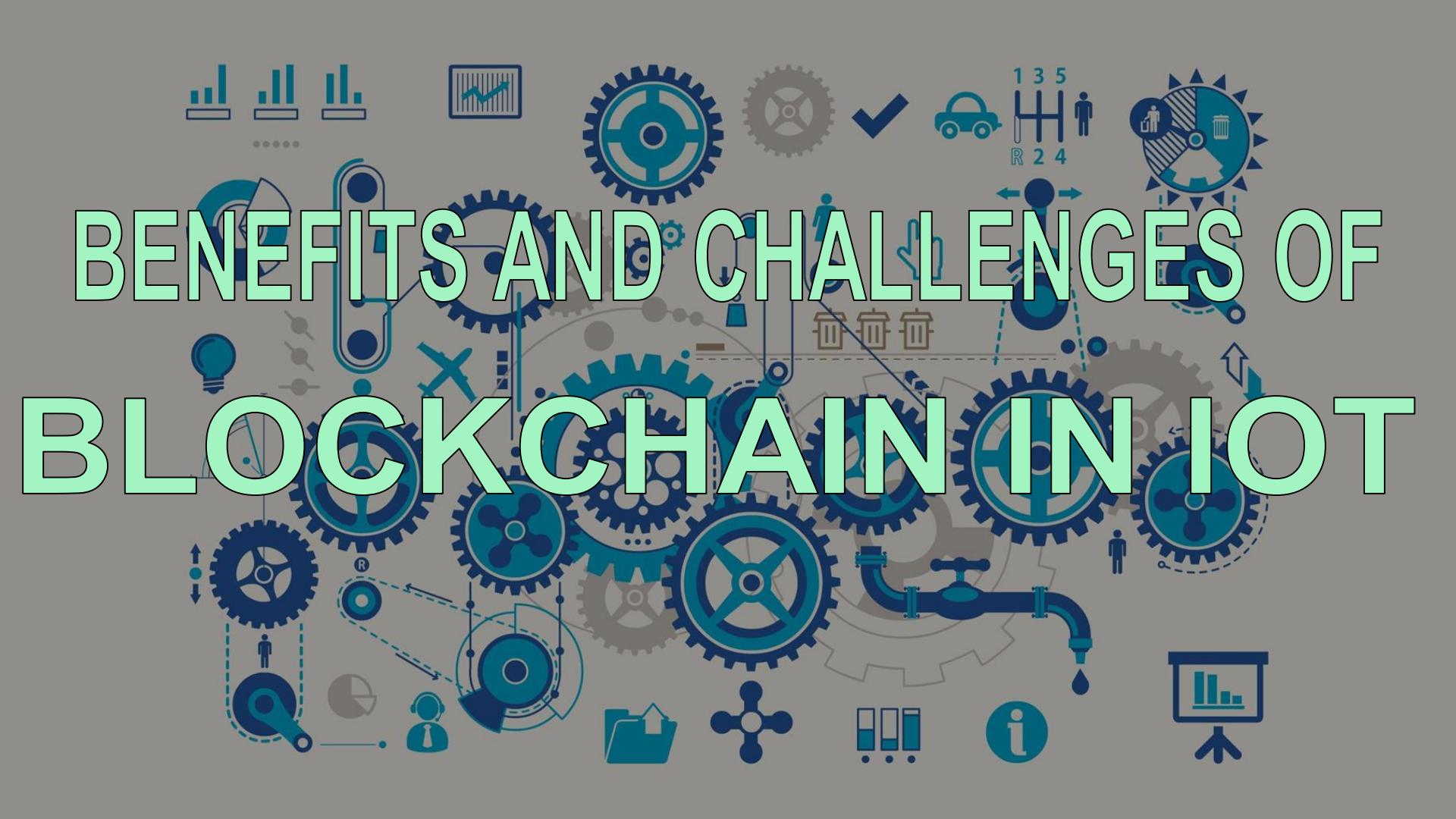
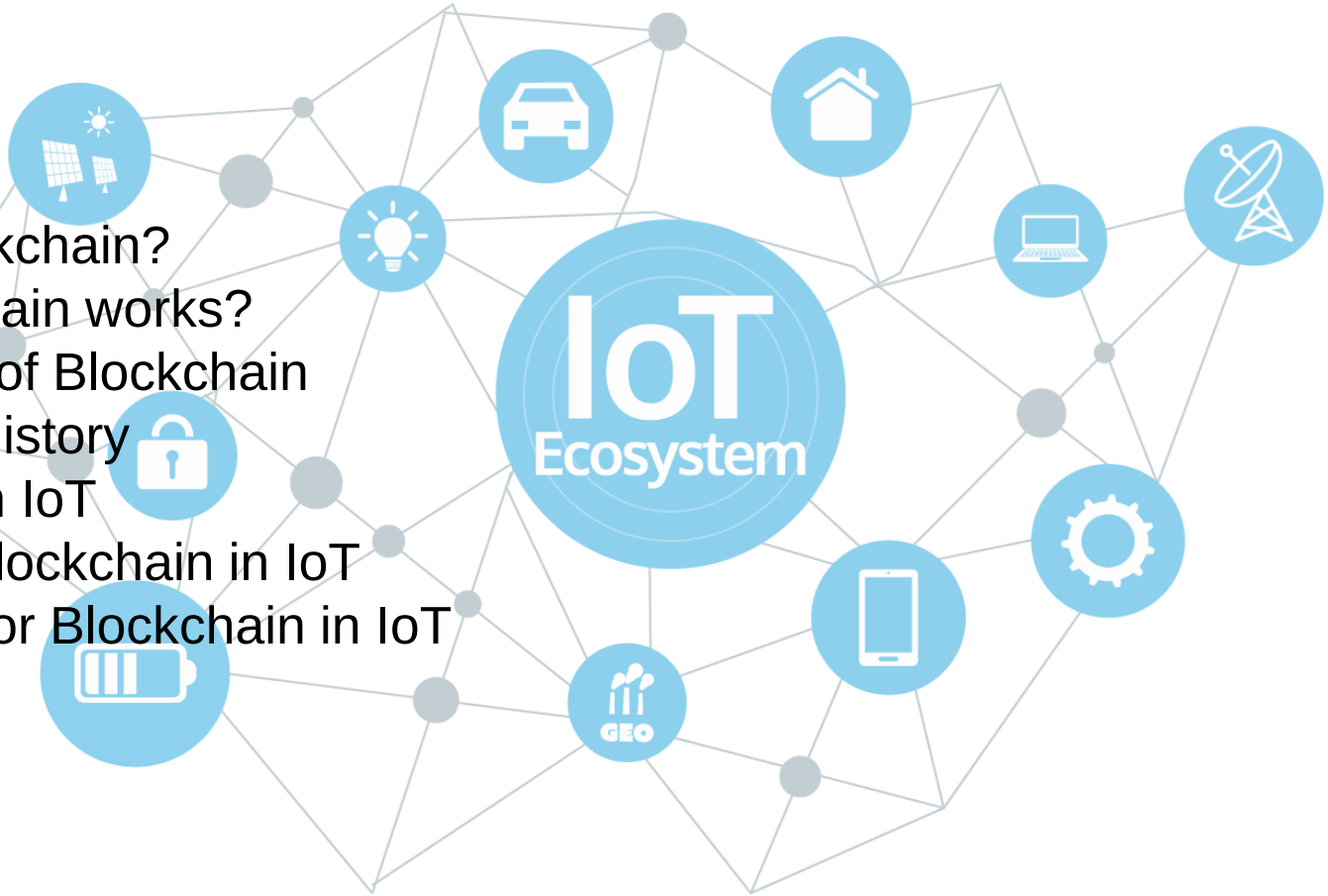

BENEFITS AND CHALLENGES OF
BLOCKCHAIN IN IOT

Contents:

- What is Blockchain?
- How Blockchain works?
- Applications of Blockchain
- Blockchain History
- Blockchain in IoT
- Benefits of Blockchain in IoT
- Challenges for Blockchain in IoT



What is Blockchain Technology?

What it enables

* Creation and real-time movement of digital assets
* Embedding trust rules inside transactions and interactions
* Time-stamping, rights and ownership proofs
* Identity ownership and representation
* Resistance to single points of failure or censorship
* Creation of crypto-currency markets
* Self-execution of business logic with self-enforcement
* Running decentralized services
* Selective transparency and privacy

What it is

Meta technology on the Internet
Decentralized database
Decentralized computers
Peer to peer network
Shared, distributed ledger
Trust layer for the Web
Software development environment

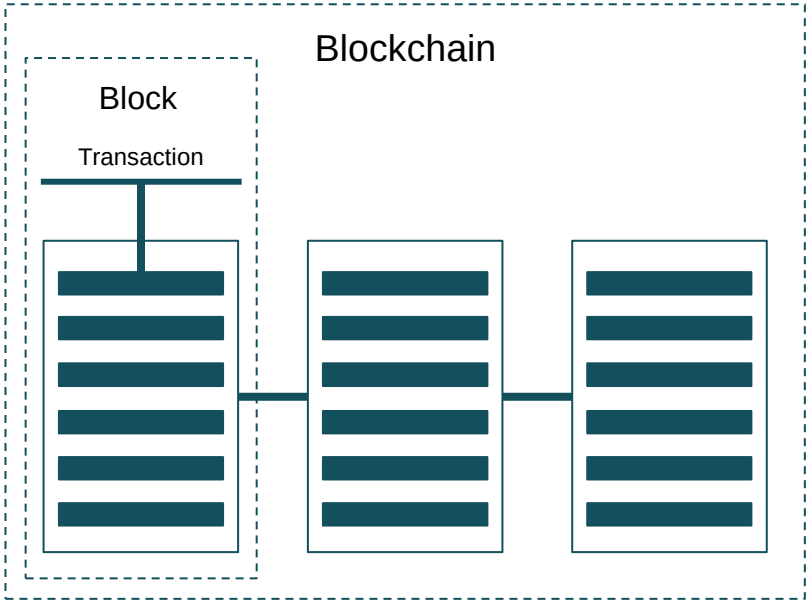
Its impact...

1. Reengineering processes
2. Rethinking roles of intermediaries
3. Bundling of services
4. New flows of value
5. Decentralized governance
6. New legal and regulatory frameworks

...across industries

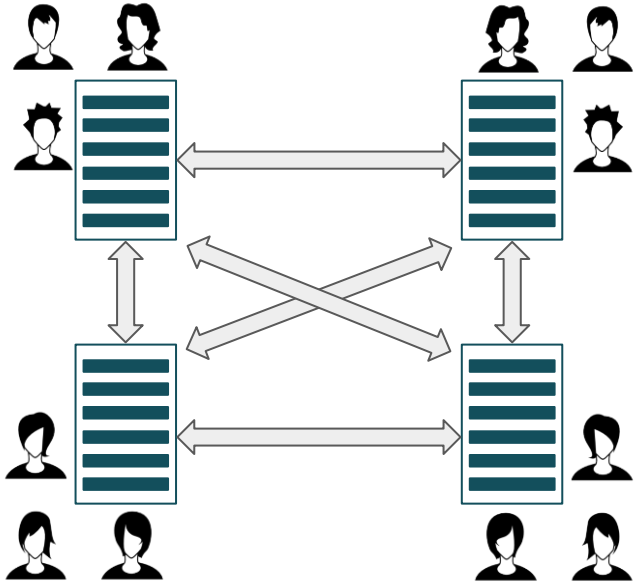
Financial services
Government services
Healthcare
Energy markets
Supply chains
Smart things
World trade

What is Blockchain?

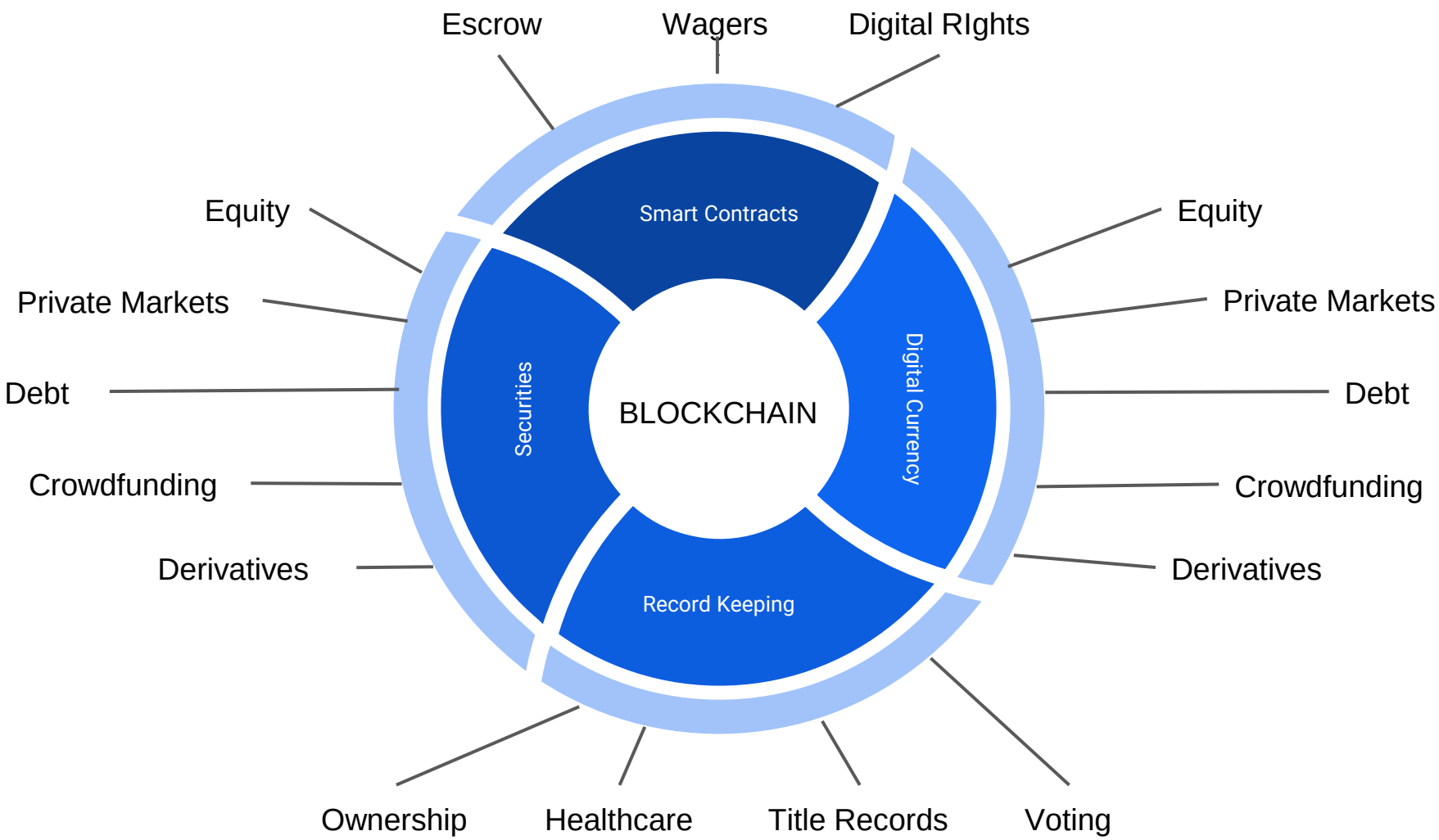


- Block = all transactions within a certain time period
- Blockchain = links all blocks together

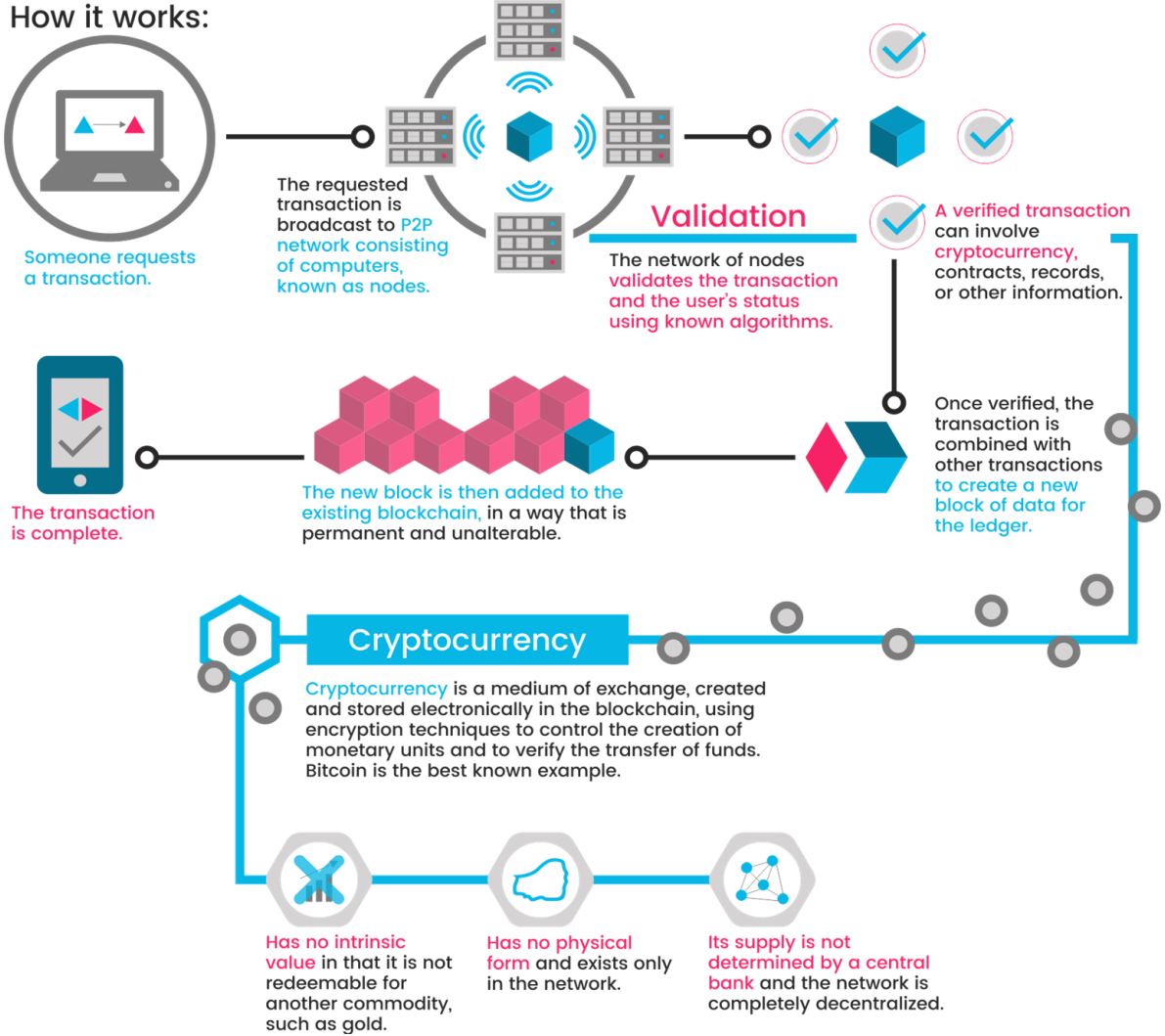
Peer to Peer = No central authority



Distributed peer-to-peer network ensures the data integrity


Escrow
Wagers
Digital RIghts
Equity
Private Markets
Debt
Crowdfunding
Derivatives
Smart Contracts
Securities
BLOCKCHAIN
Digital Currency
Record Keeping
Equity
Private Markets
Debt
Crowdfunding
Derivatives
Ownership
Healthcare
Title Records
Voting

How Blockchain works?



Problem/Opportunity

SMART HOME DEVICES FACE BOTTLENECK

1. High infrastructure and maintenance costs associated with the current centralized model
2. Connection between smart home devices is limited
3. There is no single platform that connects all devices
4. Too many online accounts and passwords
5. Our information online is susceptible to hacking

Proposed solution : Smart digital identity

Solution

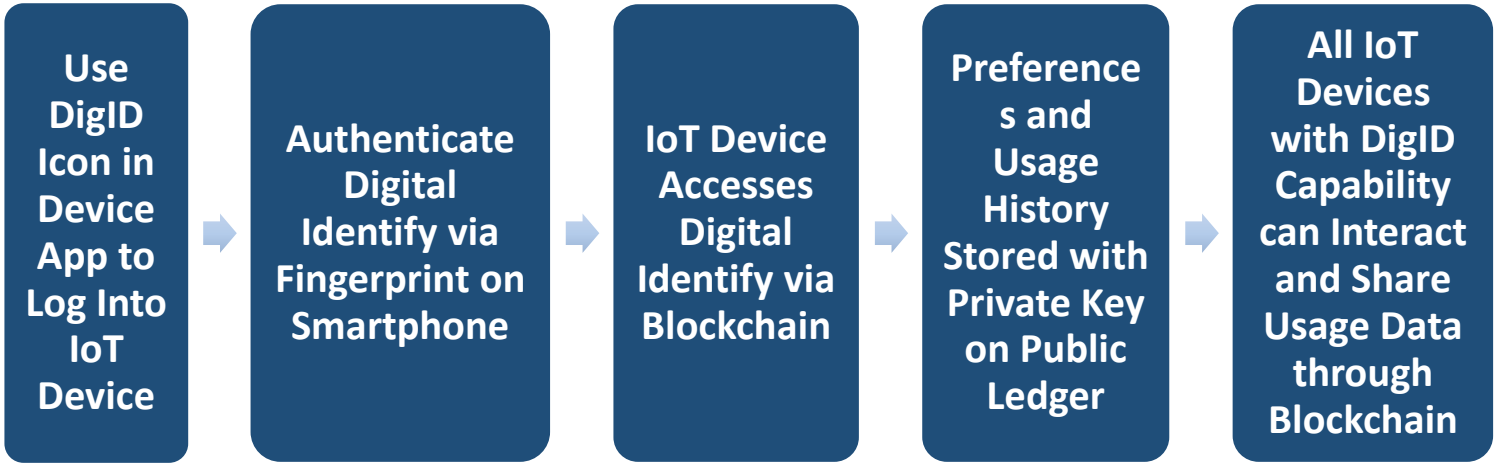
SMART DIGITAL IDENTITY

1. **Connection**
   - Operates as a main hub that connects all devices together
   - Connection of any smart device to another
   - Additional hubs are not necessary

2. **Efficiency**
   - Only one account (identity) that replace all online accounts
   - Never use online passwords again
   - Customized service based on the identity's preferences and history
   - Reduce the costs associated with installing and maintaining large centralized data centers

3. **Security**
   - Communications between devices go first through the digital identity and are executed as Blockchain transactions
   - The Blockchain technology creates ledgers that are tamper-proof and cannot be manipulated
   - Proven success in the world of financial services

Technology



- Separates usage information from user identity – usage information will be accessible to third party firms but will not be tied to any personally identifiable information
- Connects and integrates devices from different manufacturers
- Reduces complexity of manually connecting growing number of IoT devices

Technology

Value Proposition

One single control for all your smart devices, offer you a secure and worry free life

mind
for better mental health

Service Portfolio

Account Management

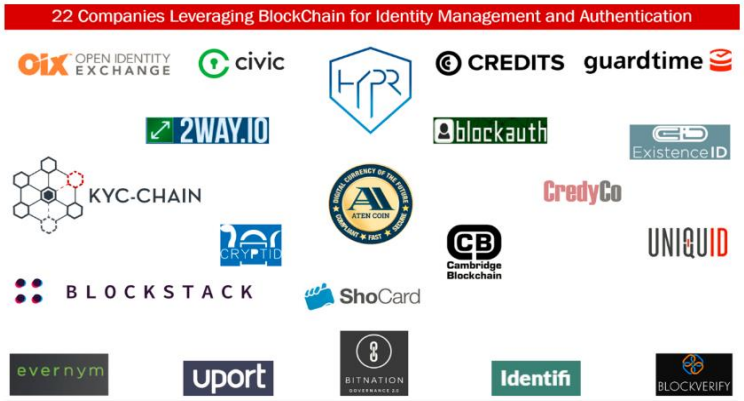
Risk Management

Competition

IoT is more than just a market, it's an entire ecosystem. Many competitors want a slice.

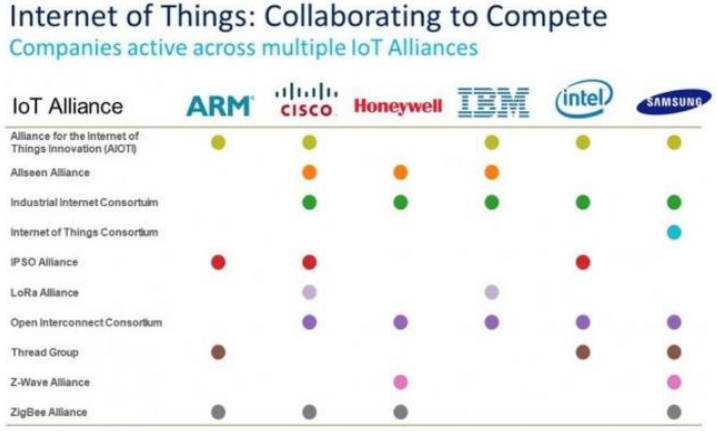
Promising Blockchain Identity Startups

Blockchain Identity Startups are building identity management applications for consumers to record and secure identification data



Giant Tech Companies

Giant Tech Companies are working on defining the standards for IoT and pairing it with the Blockchain technology



Challenges and Risks

1. Developing Collaborations and Partnerships in a Complex Environment

How can we get everyone to sign up when the business objectives of all parties of the business network are not completely aligned?

2. Low Processing Power of Current IoT Devices

Many IoT devices lack the significant horsepower needed for the encryption and verification of blockchain transactions.

3. Lack of Customers Awareness and Understanding

Blockchain is still in its early days and while many people are struggling to understand how it works; others don't even know that it exists.

Future Applications

This is only the tip of the iceberg!

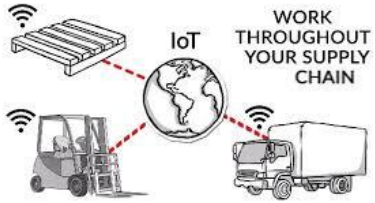
The idea is scalable to any IoT device – even those not yet in existence.

Possible targets for a Blockchain and IoT Pairing :

Smart Appliances

Connected Vehicles

Supply Chain Sensors



Blockchain and IoT: Benefits

- High Data Security
- Stronger Data Validation Process
- Better Quality Control in IoT Manufacturing
- Firewall Against DDoS Attacks
- Secure Communication Gateway
- Real-Time Tracking
- Encryption for Multifactor Authorization
- More Access Control
- Better Compliance Management
- Data Anonymity for Extra Privacy
- Stronger Cloud Management
- End-To-End Visibility Better
- Automation Process Identity
- for IoT Devices

Benefits of Blockchain IoT

High Data Security: Offers a full-proof secured network for IoT devices to communicate with one another. Can verify every single piece of information before storing it into the ledger using consensus methods to make data entry fairer.

Stronger Data Validation Process: Blockchain audits all the data from IoT devices and checks whether the data is valid or not.

Data Anonymity for Extra Privacy: Blockchain offers full anonymity to protect the user's confidential information derived from IoT devices.

Benefits of Blockchain IoT

- **Firewall Against DDoS Attacks:** Blockchain and IoT systems can detect spam traffic and increase and decrease the necessary bandwidth needed to deal with DDoS attacks.
- **End-To-End Visibility:** It's capable of offering full-time end-to-end visibility and provides private channels between two parties.
- **Real-Time Tracking:** Can offer the correct location of any goods without any interference, which gets rid of counterfeiting.

Benefits of Blockchain IoT

- **Identity for IoT Devices:** It helps to check the authenticity of every IoT device by attaching a unique identity to each device during the manufacturing process.
- **More Access Control:** Blockchain-powered IoT devices can offer smart lock systems to restrict unwanted participants.
- **Better Compliance Management:** Can foresee whether compliance are being met or not.

Benefits of Blockchain IoT

- **Better Quality Control in IoT Manufacturing:** Blockchain can increase the efficiency of IoT manufacturing by controlling the quality of the finished products.
- **Stronger Cloud Management:** Blockchain can help to encrypt all IoT data before sending it to the cloud storage.
- **Secure Communication Gateway:** Blockchain can introduce a private communication channel that's gets rid of a single point of failure.

Benefits of Blockchain IoT

- **Better Automation Process:** Blockchain coupled with IoT can oversee the automation process that includes data analysis and prompt actions.
- **Encryption for Multi-factor Authorization:** With the help of Blockchain IoT, organizations can offer biometric-based multi-factor passwords or authorization methods.
- **Collaborative Environment for Shared Economy:** Blockchain can offer a secured hub for all the shared economy industries and use IoT devices to oversee the business processes.

Top Blockchain IoT Use Cases

- Supply Chain Management
- Pharmacy
- Agriculture
- Smart Homes
- Automotive Sector
- Sharing Economy

Supply Chain Management

- Can introduce IoT integrated vehicles that can track the shipments until the delivery.
- Using IoT based sensors can help companies to get crucial information about the shipment status, such as the temperature, motion, pressure, etc.
- The overall traceability and reliability of the network can improve significantly if blockchain and IoT are used together.

Supply Chain Management

- Once the data gets added to the ledger, the stakeholders can use smart contracts to get access to them in real-time.
- Companies can automate all transactions across borders and different shipments.
- It can track the entire process of the supply chain and increase the overall efficiency and quality of the manufacturing process.

Smart Homes

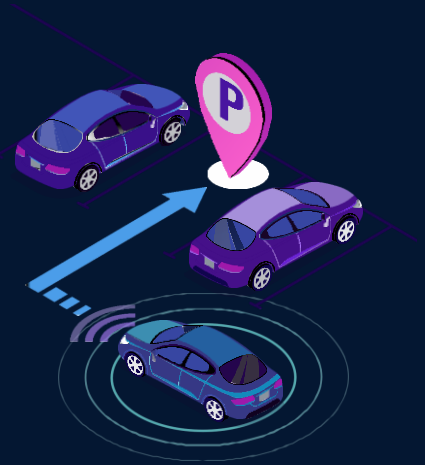
- Using IoT Blockchain, smart homes can get more security when it uses smartphones to manage the devices.
- Blockchain eliminates the need for conventional centralized information storing approach in IoT devices.
- Blockchain smart home solutions can securely store user sensitive data such as Face ID, Fingerprints, Voice ID, etc.

Pharmacy

- Blockchain with IoT devices can help track the pharmaceutical drugs from the manufacturing to the end-user, eliminating counterfeit drug issues.
- Applications can track any legal changes in the ownership of the prescription to avoid any false or forged prescription issues.
- It helps users to gain access and control over their data and make the payment process much simpler.

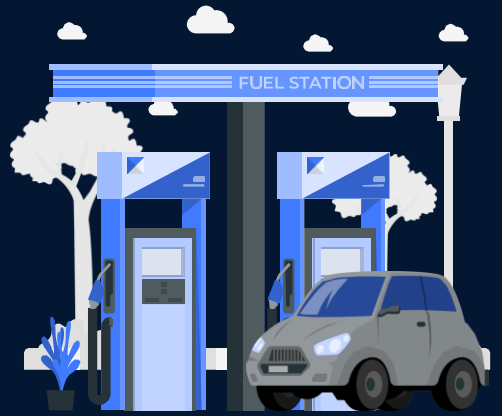
Automotive Sector

- Helps users to access crucial information in a master and easier way; also, the information remains protected from outside forces.
- Using blockchain with IoT helps to develop smart parking solutions that help users to discover parking spots nearby.
- Using the IoT sensors, blockchain automates traffic controls judging by the amount of traffic present at any given moment.



Automotive Sector

- Blockchain IoT can automate any type of fuel payment once certain conditions are met.
- It can also help to develop and manage autonomous cars and help to analyze the data derived from the tests.
- It can facilitate crypto payments using smart contracts when the vehicle is repaired.



Agriculture

- Blockchain IoT can track the weather impact and other external factors to increase the quality of the crops.
- It helps to grow more food for the population and helps to keep carbon footprint minimal.
- Helps to increase customer trust by improving the transparency level throughout the industry.

Agriculture

- It enables real-time traceability of various food products from the farms to the stores.
- Installing IoT in farms and managing it using blockchain can improve the supply chain output of agricultural industries.
- Offers farmers the option to pre-sale their produces using smart contracts and get paid in advance.

Sharing Economy

- Blockchain can help develop a new shared economy with decentralized applications.
- Decentralized applications within the ecosystem can help to increase the revenue by seamless sharing of services and goods.
- Smart contracts can increase data transparency along with privacy by controlling access to information.

Water Management

- It can help to manage water by tracking how much water is being used and can automate shutdown in terms of any leakage.
- It can use blockchain IoT to monitor, store data and use that data to increase efficiency.
- Can combine the technologies to collect data from water to determine whether the water is contaminated or not.