



# Blockchain and AI

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Blockchain Secure

Sept 29, 2021

AFCEA Conference, Czech Chapter

Prague



# Summary

- Data is essential to solve AI problems
- Data Issues
- Identity Issues
- The Blockchain as an enabler of Trust
- Combined with AI and IOT, Blockchain will generate high values
- Global architecture for secure and trusted system
- The case of Identity – DID and DID applications
- The case of Decentralized Data and Data Monetization
- The new Movement economy
- Conclusion



# Promising AI based on Data *but Something is wrong...*

- Modern society runs on data
- Artificial intelligence (AI) extracts value from data.
- More data leads to more accurate AI model
- Thus, more benefits to society and business.
- **Now what is wrong ?**
- The greatest beneficiaries are Few companies that have *huge* data oceans and able to invest Billions of \$ on AI expertise (AAAFM...)
- while
  - Startups have excellent AI expertise but are starving for data;
  - Many organizations and enterprises generates data and lack AI expertise


## **The results**

- the Power is in the hands of Few,
- users suffer from Vendors lock-in & loss of sovereignty .

# The world's most valuable resource is no longer oil but data



<https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>



# The Problem: Our Data is Everywhere and controlled by others...

*What each large company knows about you.*

- Google knows everything we have ever bought at Amazon.
- Alexa is listening to you all the time.
- Amazon employees can and do listen to your conversations ("for training purposes").
- Same with Siri.
- Google and Apple know every place you go.
- Your entire prescription history is available to any company that wants to purchase it.
- Credit-card companies sell your purchase data to hedge funds and ad agencies.
- Most companies you do business with store your credit-card data.
- Theft is common.
- Large, monopolistic companies harvest our data, use it, and sell it to others.
- We are the product.
- It seems free, but it isn't.
- We are worth a lot of money to Facebook, Google, and other large companies.
- They also don't keep our data safe.



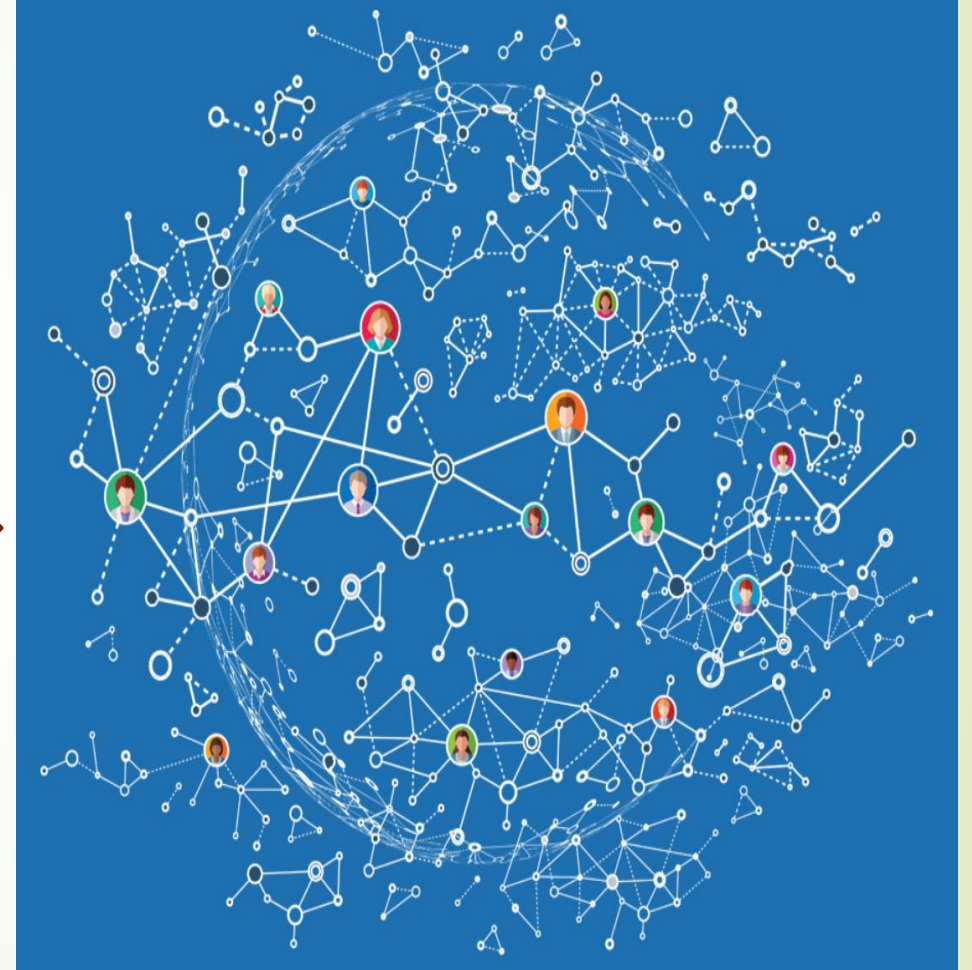
A new Dimension in the Problem  
To access this data, we rely on few ID providers



**Data Providers**

**+  
They are also  
ID Providers  
for all digital interactions !**

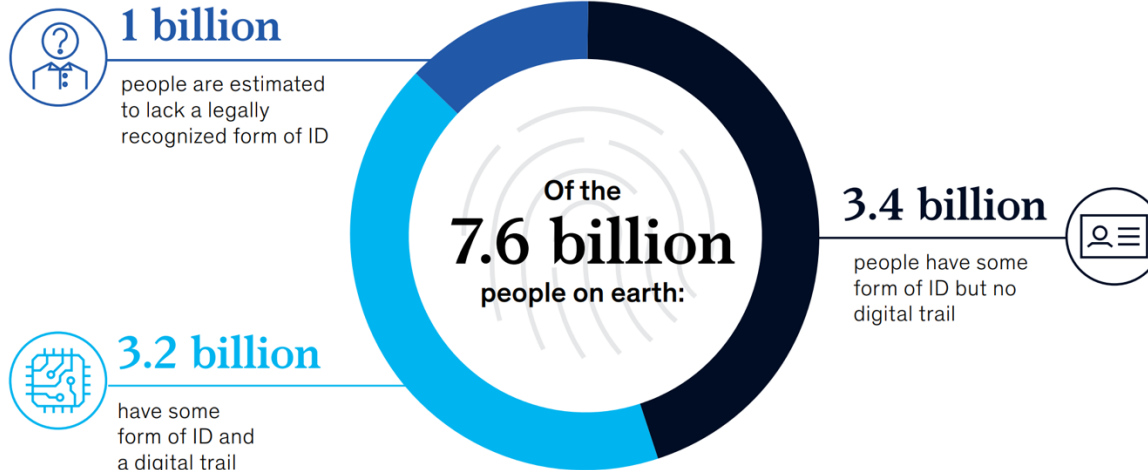
# Identity Chaos



# Digital ID Requirements

## What is good digital ID?

Good digital ID is identification that is verified and authenticated to a high degree of assurance over digital channels, is unique, is established with individual consent, and protects user privacy and ensures control over personal data.



## Unlocking global economic value

Across our focus countries, digital ID could unlock economic value equivalent of 3–13% of GDP in 2030.

- Verified
- Authenticated
- Unique
- Individual consent
- Privacy protection
- Control

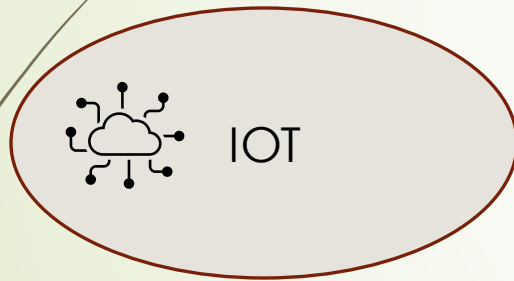




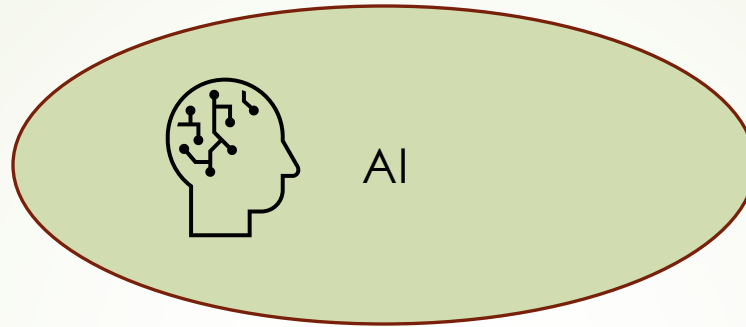
# The Solution

- Give universal identity to objects, individuals, companies, data, devices
- Associate credentials
- Democratize DATA
- Proof ownership
- Authenticate the source
- Upon data consumption, compensate data producers (fair Monetization)

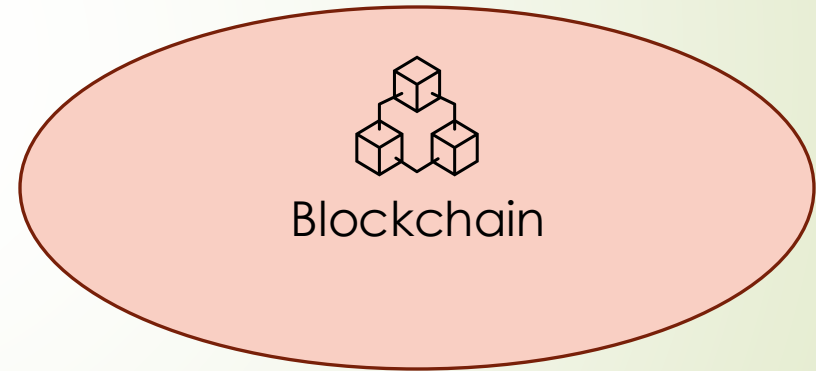
# The Pillars



Data Capture



Learning  
Inference



Trusted Data & Applications:  
Register  
Share  
Monetize

# Application Domains

**Smart City**

**Mobility**

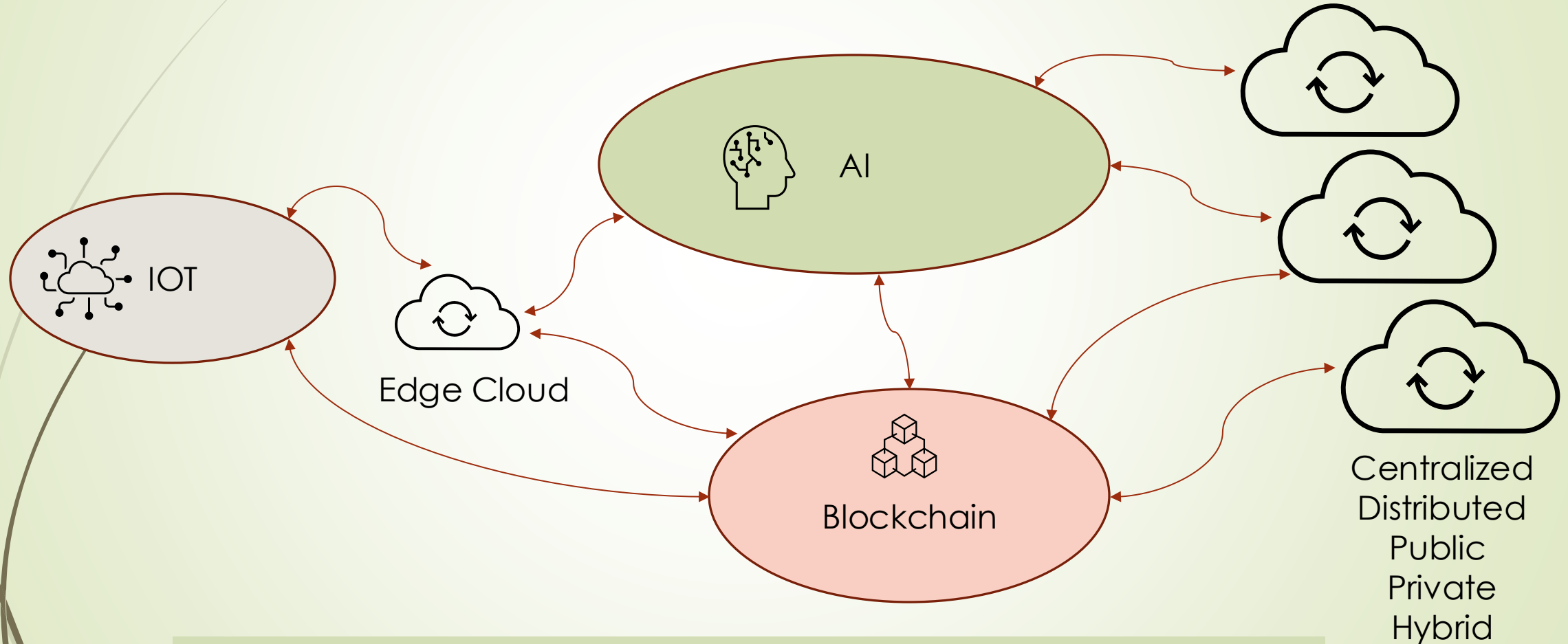
**Healthcare**

**Industry**

**Military Operations**



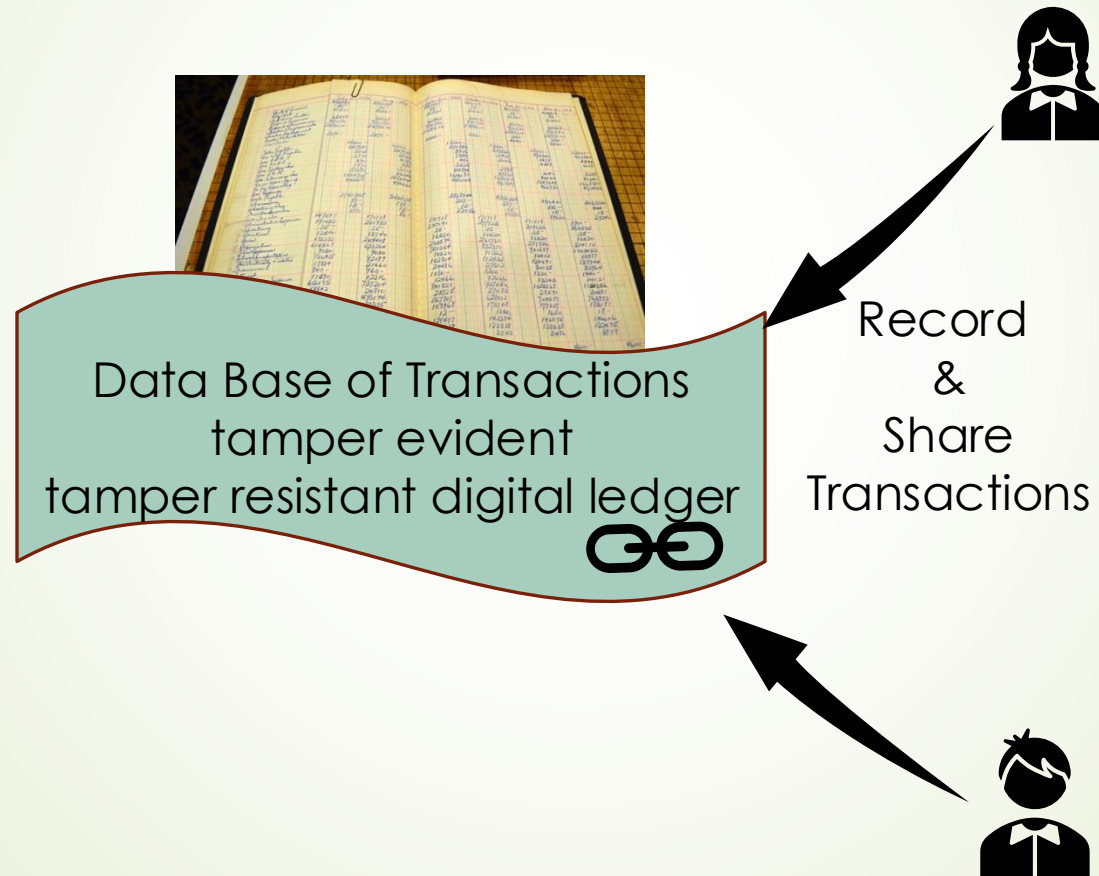
# Where Computing and Data Storage are Taking Place



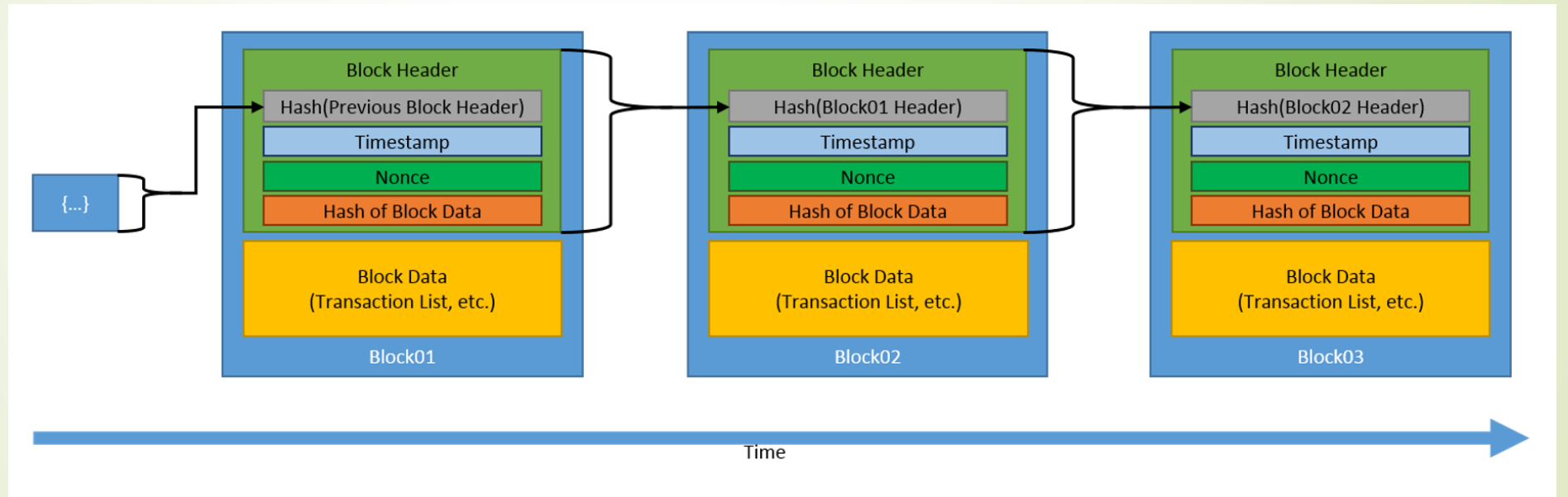
Few Players dominate the Public Cloud segments, in addition to Data and ID...!



# What is a Blockchain ?



# What's Inside



# Comparing Blockchains : Immutability and Longevity

## Public/Permissionless

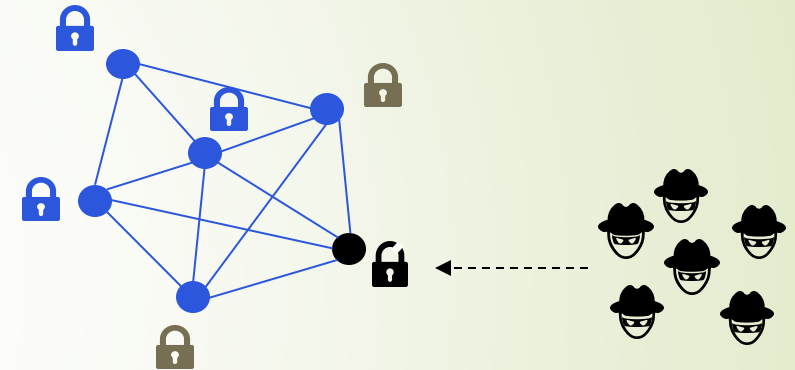


**Secured by 15k+ independent nodes**

**Resilience of replicated data**  
including immutability

**Every day, 5-10 M\$ spent** in fees in order  
to keep the network running

## Private / Permissioned



**Secured by a smaller number nodes**

**Only as secure as weakest link**, when the  
network starts expanding to small & mid-sized actors

**What happens to the assets**  
if the governance or business model break down?



# Blockchain Status Sept 2021 ?

- Bitcoin Store of Value and Payment (18.8 M minted out of 21 M BTC)
- Ethereum Programmable , many dApps. DEFI and NFT Boom. High Fees
- Competition with Tezos, Polkadot, Cardano, Algorand, Solana ....
- NFT wave pushing for New Blockchains –
  - scalable,
  - High TPS
  - Small fees per Transaction
  - Interoperable



# Who Are the Players ?

## Permissionless

- Bitcoin
- Ethereum
- Cardano
- Polkadot
- Tezos
- Algorand
- BSC

## Permissioned

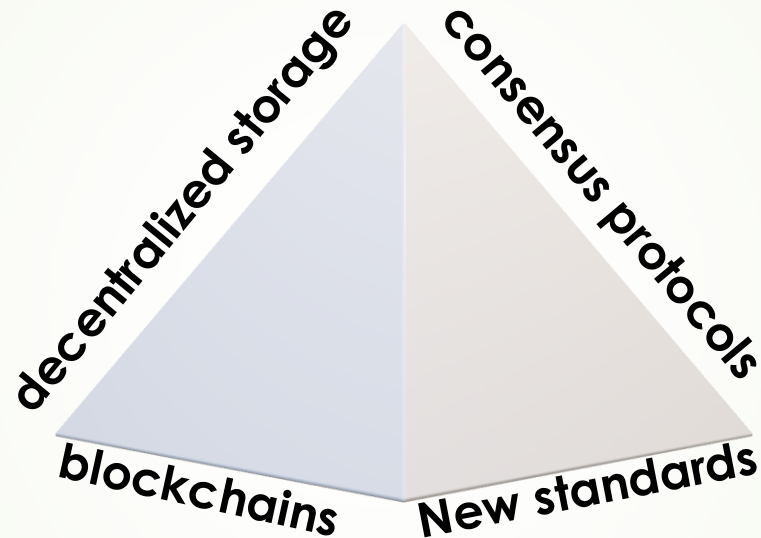
- Hyperledger Fabric
- Hyperledger Besu
- Corda

## Permissionless NFT Oriented

- Solana
- Polygon
- Efinity
- Avalanche
- Flow

+ National Initiatives.... EBSI in Europe

# Blockchain enables Decentralized Identifiers (DID), Decentralized Storage and more...




Blockchain technology and protocols are well suited for enabling

**Decentralized IDs (DID) , SSI**

**Decentralized Storage,**

**Decentralized Compute....**

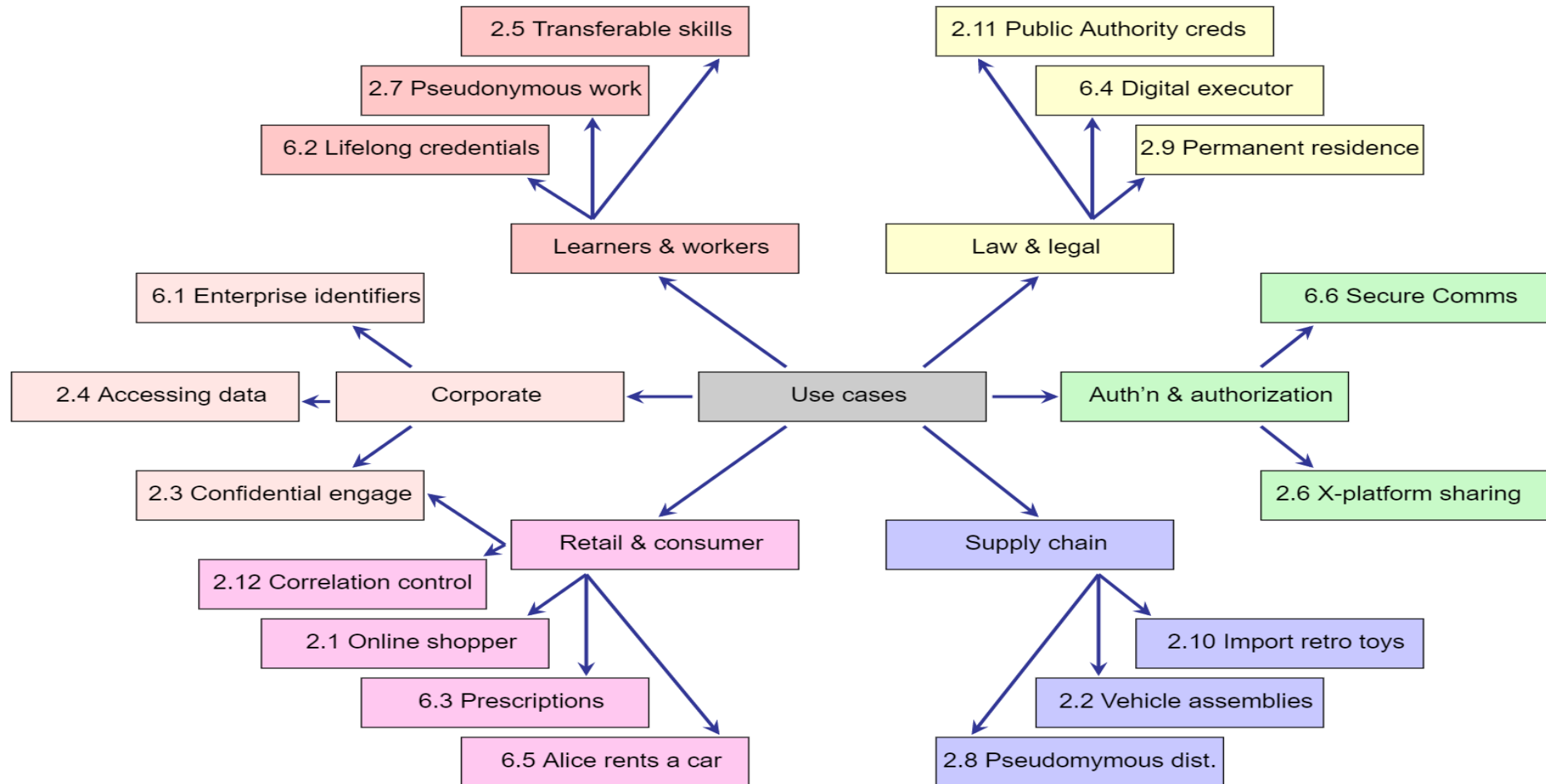


# Decentralized Identifiers (DID) Main Characteristics

- **decentralized**: no central issuing agency;
- **persistent**: the identifier should be inherently persistent, not requiring the continued operation of an underlying organization;
- **cryptographically verifiable**: it should be possible to prove control of the identifier cryptographically;
- **resolvable**: it should be possible to discover metadata about the identifier.

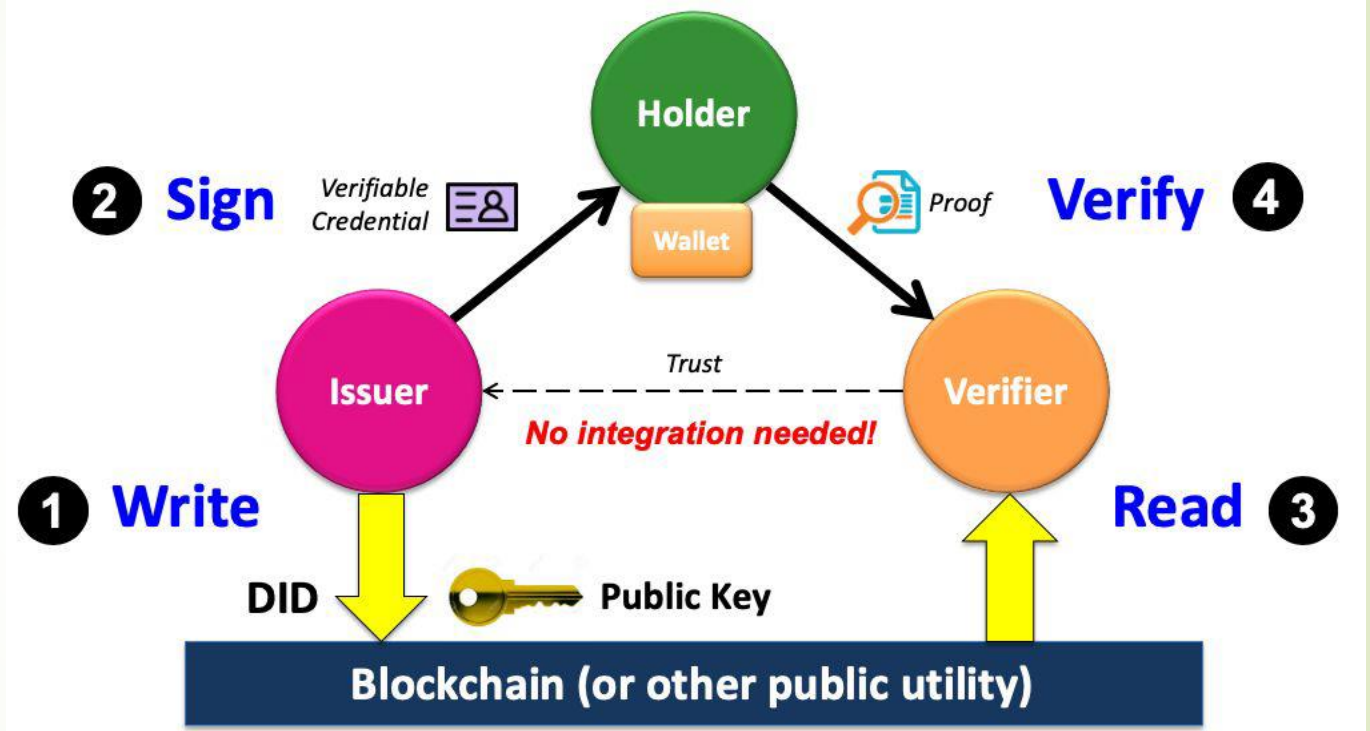
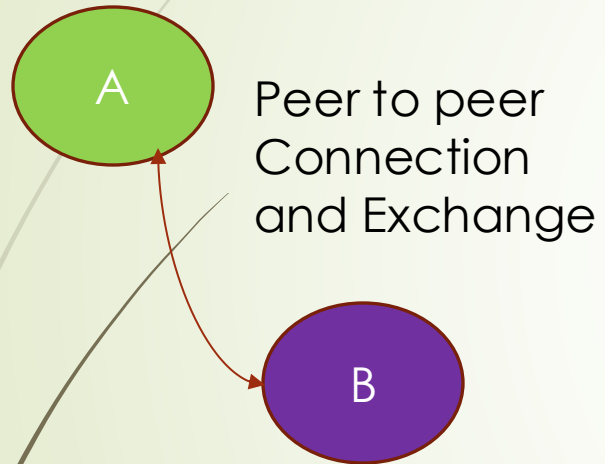
Perhaps the most salient point about Decentralized Identifiers is that there are no "Identity Providers"

# DID & Verifiable Credentials Use Cases

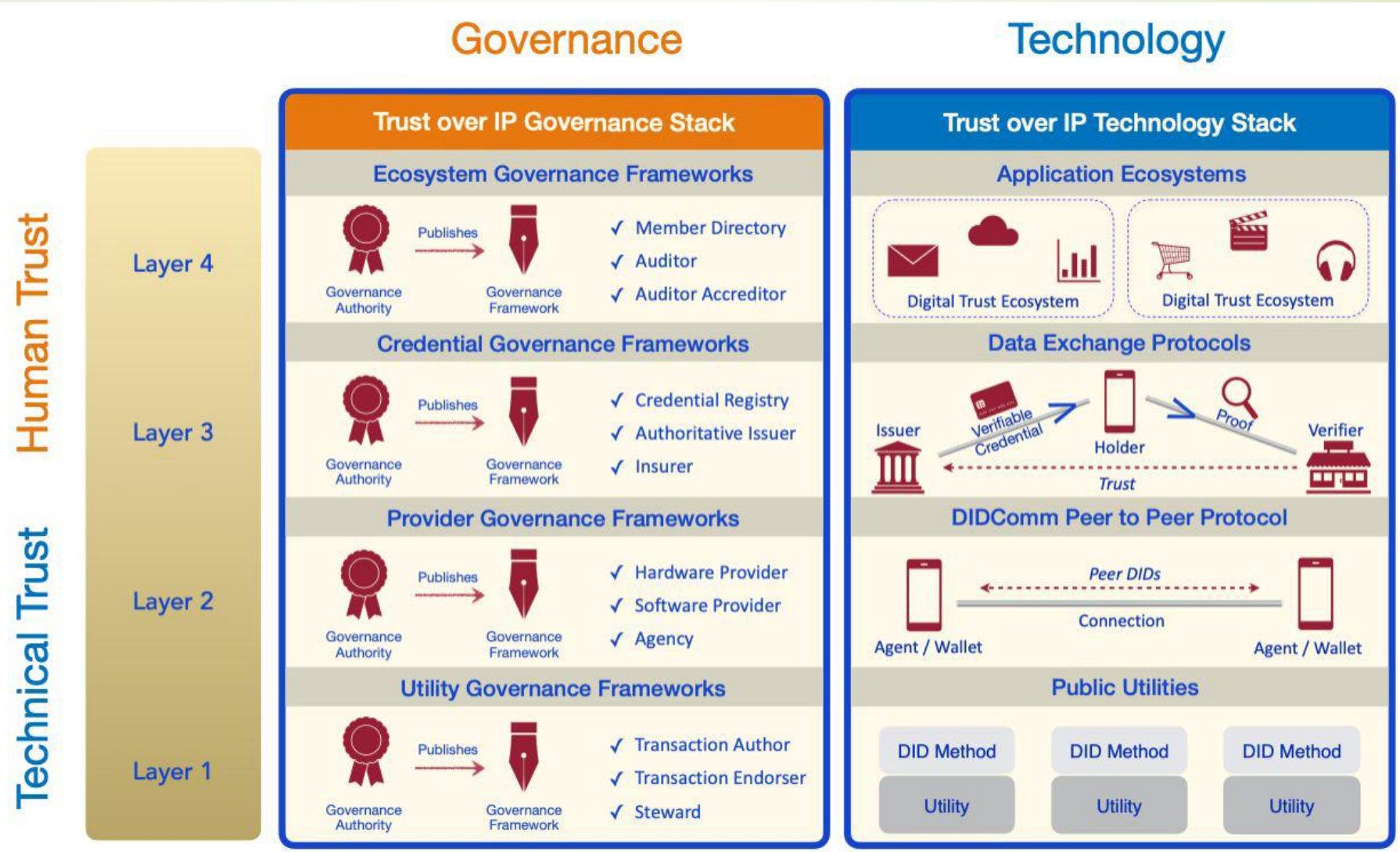




# Trust Models



# Trust over IP (ToIP) Stack





# MOBI Mobility Open Blockchain Initiative

Convergence of emerging technologies — AI, IoT, and Blockchain —

Any smart device, vehicle, smartphone, sensor, road, or other piece of transportation infrastructure,

identity

intelligent

communicate

participate as an independent agent in economic transactions.

*Make mobility safer, greener, and more accessible*



# MOBI BASIC Foundations



B

**Blockchain.** A tamper-proof distributed ledger that records transactions and enables entities — be they individuals, organizations, vehicles, connected infrastructure, or objects — to directly exchange value and coordinate behavior. Blockchain technology is poised to enable new services and automate transactions by means of a radical, decentralized approach to business data and accounting.

A

**Artificial Intelligence.** Artificial intelligence allows machines to solve complex problems that would otherwise require human input. Cars, busses, subways, and other vehicles will become increasingly autonomous, not only in terms of moving from point A to point B but also in their ability to initiate and execute vehicle-to-everything (V2X) transactions. Autonomous vehicles and AI more generally will radically change not only mobility but the entire economy.

S

**Services.** Digital technologies are turning products into services. We are seeing a rapid acceleration of MaaS and usage-based consumption models. Automakers will sell fewer cars to private owners while expanding their mobility and fleet management services. Insurance companies increasingly see their future in usage-based mobility insurance.

I

**Internet of Things.** Improvements in internet connectivity, speed, sensors, and computing power are turning vehicles and mobility infrastructure (roads, signals, tolls, charging stations, etc.) into nodes on the IoT. Vehicles are now gathering a variety of rich telematics data and increasingly have the computing power to extract and share insights from that data.

C

**Connectivity.** Not only vehicles, but people are becoming increasingly connected as well. Nearly half of the world's population has a smartphone. This means billions of people are constantly connected to the internet and to ubiquitous internet commerce platforms. Connected vehicles are the "fourth screen" and an additional access point to these commerce platforms.



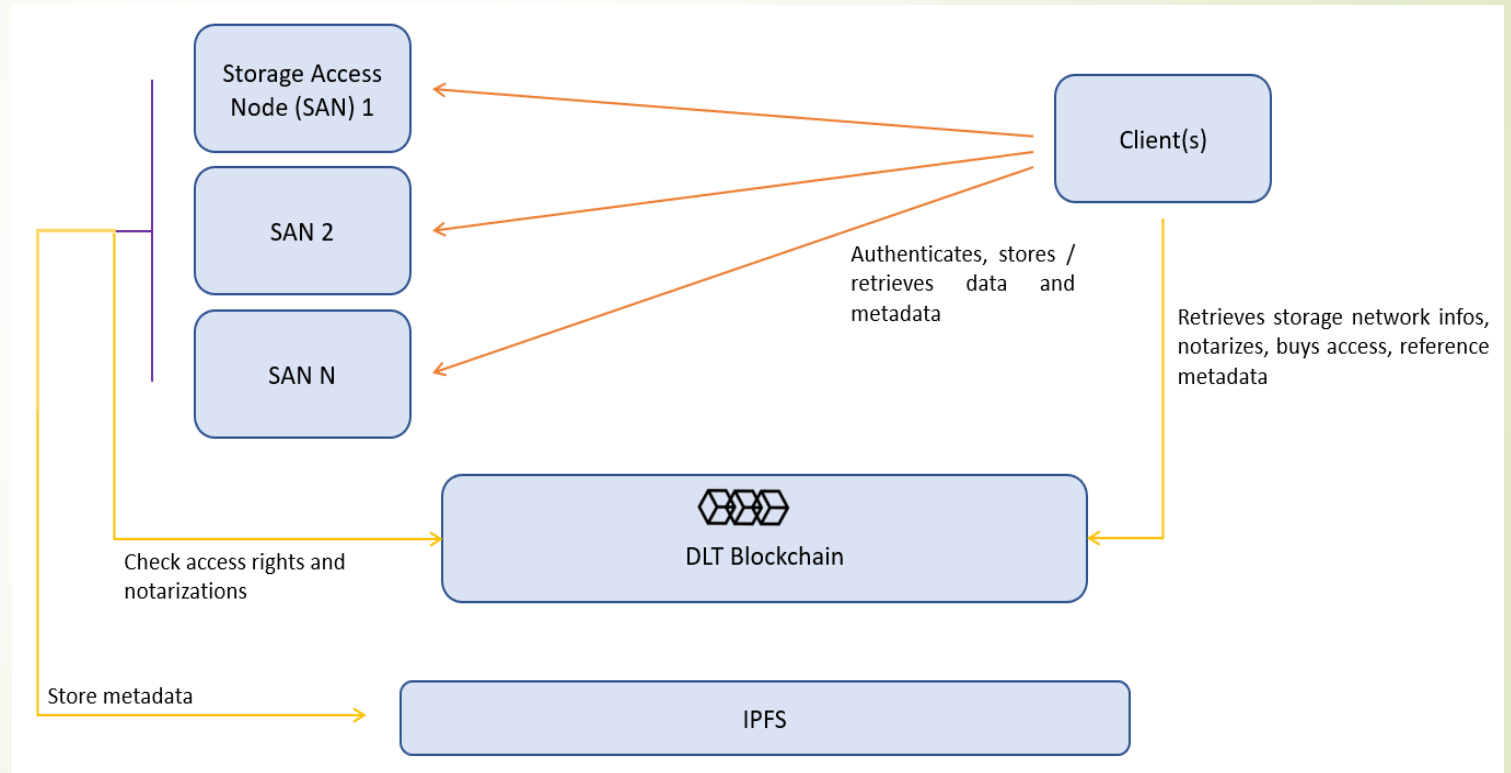


# Decentralized Data Storage

- Storj
- Filecoin
- Sia
- Permissioned solution like BCS Datashare
  - Managed by consortia (community – AI Startups, Data owners) to launch their own decentralized data storage platform without relying on a central authority,
  - Trading and sharing Data capabilities in a secure and immutable way – Data is authentic, source is confirmed and checked, all processing is traceable
  - The consortia could scale up the solution with new members onboarding, and deploy their own rules with consensus

# BCS Datashare - Architecture

- Arbitrary number of SAN. Being hosted and run by independent operators.
- Agnostic Blockchain used for data notarization and data access management.
- Public or private IPFS network used for metadata storage.
- Unlimited number of clients interacting with the network.





# Conclusion



- ▶ AI, IoT, Blockchain combined with strong connectivity and new business model could give lead to a better world
- ▶ Blockchain will play a fundamental role in enabling new solutions
- ▶ Remaining research fields
  - ▶ interoperability,
  - ▶ scale,
  - ▶ governance for peer-to-peer environment