

# Health 3.0

# Blockchain and cryptohealth unveiled

IN PARTNERSHIP WITH:



**101 Blockchains**

# DISCLAIMER

- ❑ The presentation is not intended to provide any investment advice and should not be taken as such. ***Do your own research!***
- ❑ Although I may address business, financial, investment and legal issues, I do not provide any business, financial, legal or investment advice and my claims should not be construed or used as such.
- ❑ **I shall not be responsible for any loss sustained by any person who relies on this class.**

# THIS TALK IS FOR YOU IF YOU WANT TO:



**Learn why and what is Healthcare 3.0  
– Ownership Health**



**Understand self-sovereign identity,  
data liquidity, privacy-preserving  
technologies, and federated learning**



**Know how tokens, NFTs, and DAOs  
can redesign healthcare and  
transform patients from health  
service consumers to health and  
wealth producers**



## **Dr. Alex Cahana**

Pain specialist for 26 years

Built Pain Centers in Israel, Japan, Switzerland, US

Since 2014 decentralized technology and Tokenomics

Blockchain and Healthcare Expert for the UN/CEFACT

Founding partner of ImpactRooms for EMDE

Board member at AdanianLabs Africa and ACHA (Americas  
Continental Health Alliance)

**Blockchange Healthcare**

**Healthify Crypto**

**Leapfrog health systems**



# BLUF

**In a post COVID-19  
world**

**decentralized  
healthcare is a more  
resilient system**

- 1. Solve the problem of Trust (computational trust)
- 1. Attack-censor-collusion resistant
- 1. Community-Connectedness-Capacity development
- 1. Coopetition and new business models

# Lesson 1: Healthcare 1.0-2.0-3.0

## **BLOCKCHAIN IN HEALTHCARE**

# Read Write Own



## Web 1.0

- \_ Basic Web Pages
- \_ Html
- \_ Ecommerce
- \_ Java & Javascript

1990 - 2005



## Web 2.0

- \_ Social Media
- \_ User Generated Content
- \_ Mobile Access
- \_ High-quality Camera & Video
- \_ Apps
- \_ Corps Monetizing Your Data
- \_ High-speed Communication
- \_ Global Internet Access

2006- PRESENT DAY



## Web 3.0

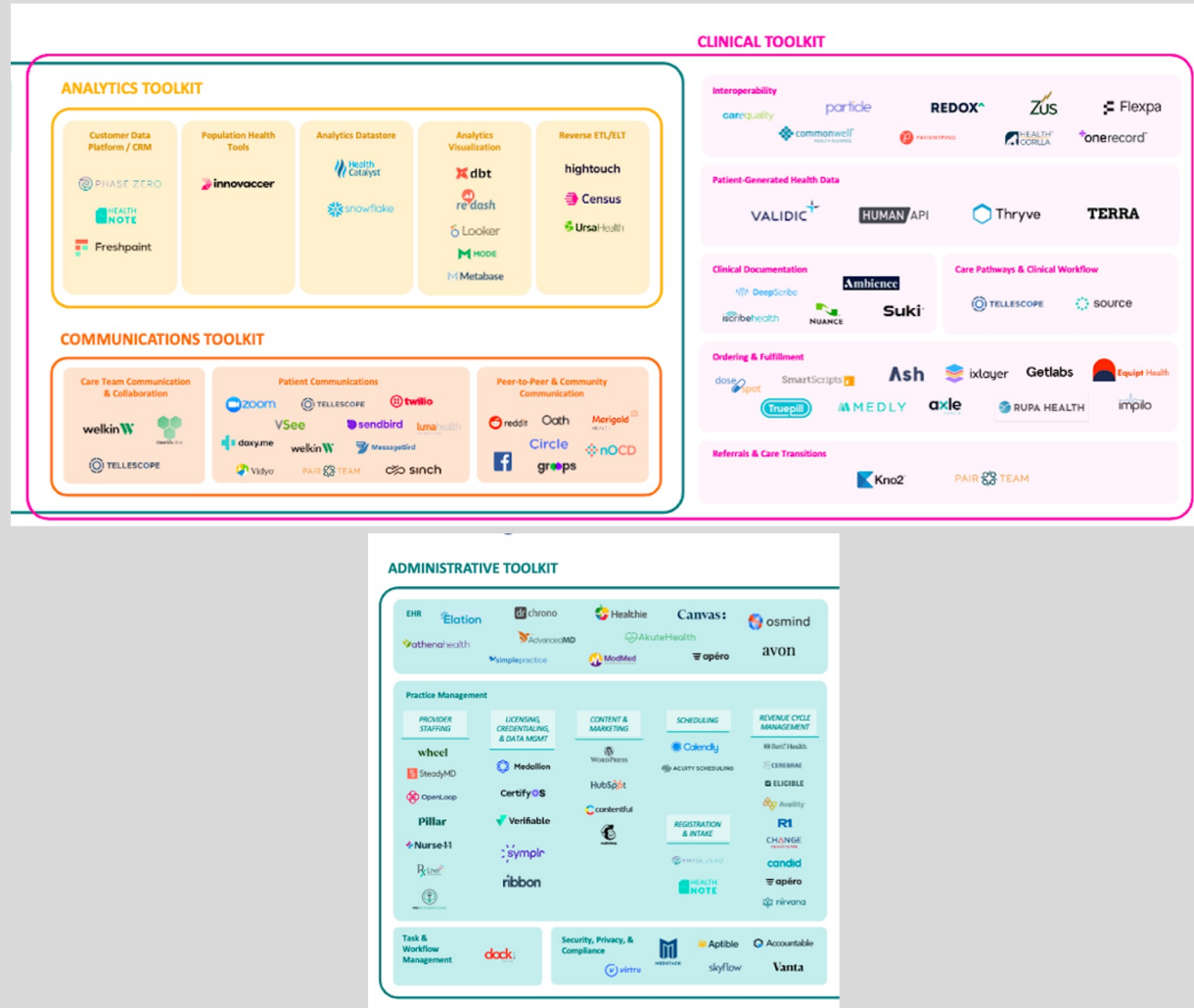
- \_ Semantic Web
- \_ dApps
- \_ Users Monetize Their Data
- \_ NFTs
- \_ VR & AR (Metaverse)
- \_ Permissionless Blockchains
- \_ Artificial Intelligence
- \_ Interoperability

IMMINENT

# Health 1.0 Digital Health

- 1. Health 1.0 (2008-2016)
  - 1. "Access Health", analogue to digital records
  - 1. Mandatory use of EHR (the HITECH Act 2009)
  - 1. Data electronically collected so patients will receive better, timely and personalized care (right patient, right care, right time).

# Complex stack Friction User burn out



# Health 2.0

1. Health 2.0 (2016-2022)
  1. "Personal Choice Health", patient-centric
  1. Wellbeing health apps, wearables, remote monitoring, telehealth, value-based everything
  1. Mobile heavy, bio-hacking, data driven
  1. Value based everything (VBC, VBC, VBP)

# Exclusionary data asymmetry

## rent seeking data market

## Originators

## EHR Software

### Integrated Systems



### Distribution



## Pharmacies



## Claims Clearinghouses



## Labs



## Wearables



## Information Exchanges



### Government Entities



## Socioeconomic and Behavioral Data



# Healthcare Data Ecosystem

COMPILED BY  DATAVANT

## Enterprise Data Warehousing



## Aggregators



## Registries and Consortia



## Use Cases

## Services for Providers



## Services for Risk-Bearing Entities



## Services for Biopharmaceuticals



# Health 3.0

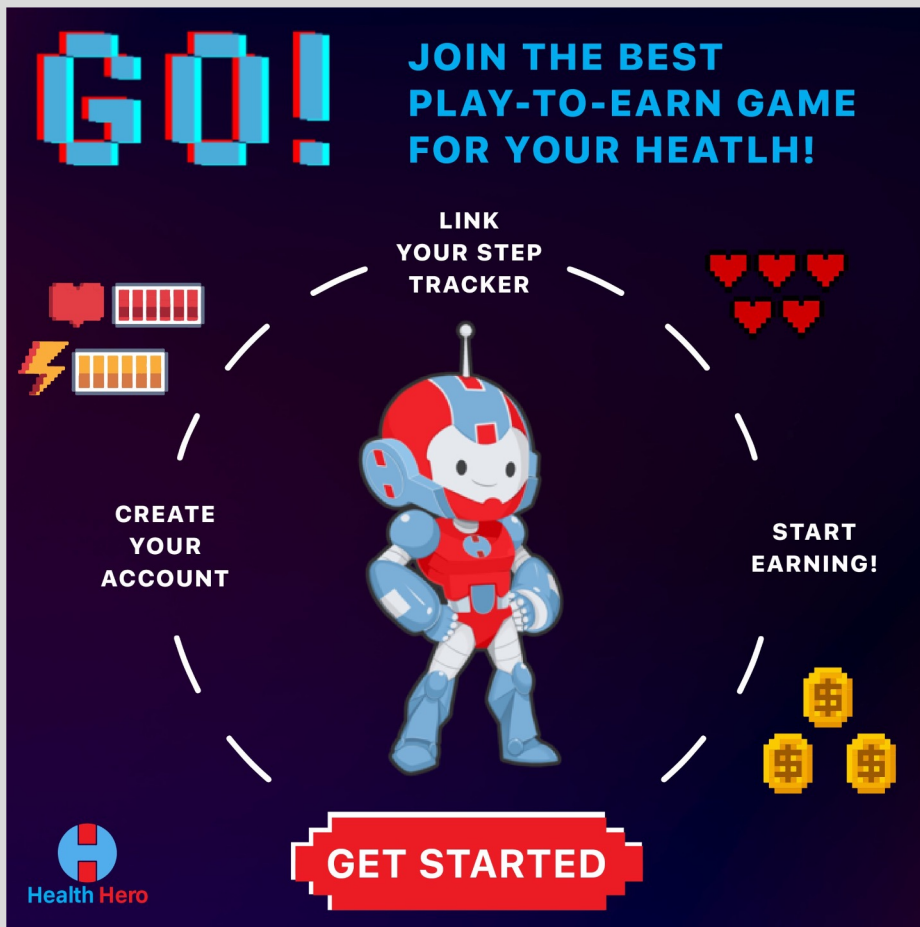
1. Health 3.0 (2022- )
  1. “Ownership Health”, patient-driven
  1. Data privacy, security, sovereignty
  1. Data as dignified labor and financial inclusion



Patient-driven

Consumer to  
health and wealth  
producer

Physical, mental  
and  
financial health



# Lesson 2: Five use cases of DLT in Healthcare

**BLOCKCHAIN IN HEALTHCARE**

**Current  
healthtech is  
NOT interested  
in blockchain**



**Optimization – AI / ML / DL / RL / DRL / FL**

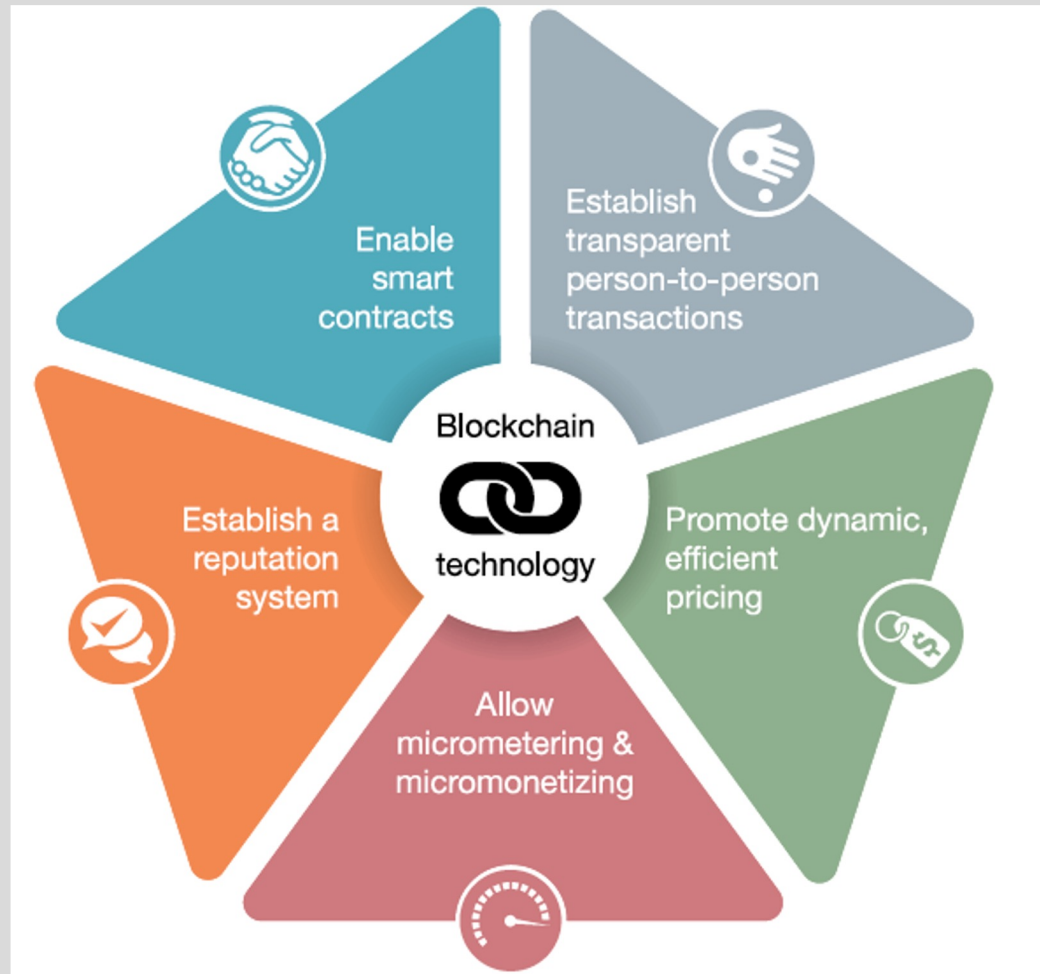


**Innovation – Digiceuticals / Pharmaceuticals / CRISPR**



**Access – Telehealth / Consolidation / Oligopolies**

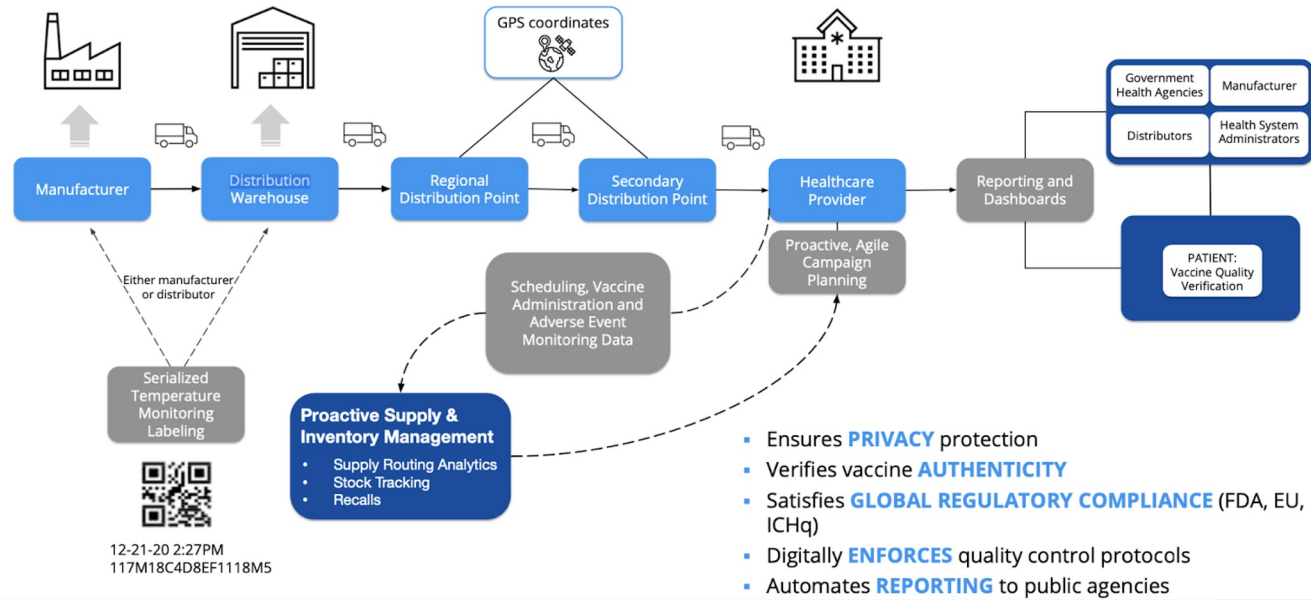
# Blockchain is the software solution to solve the problem of (mis)Trust



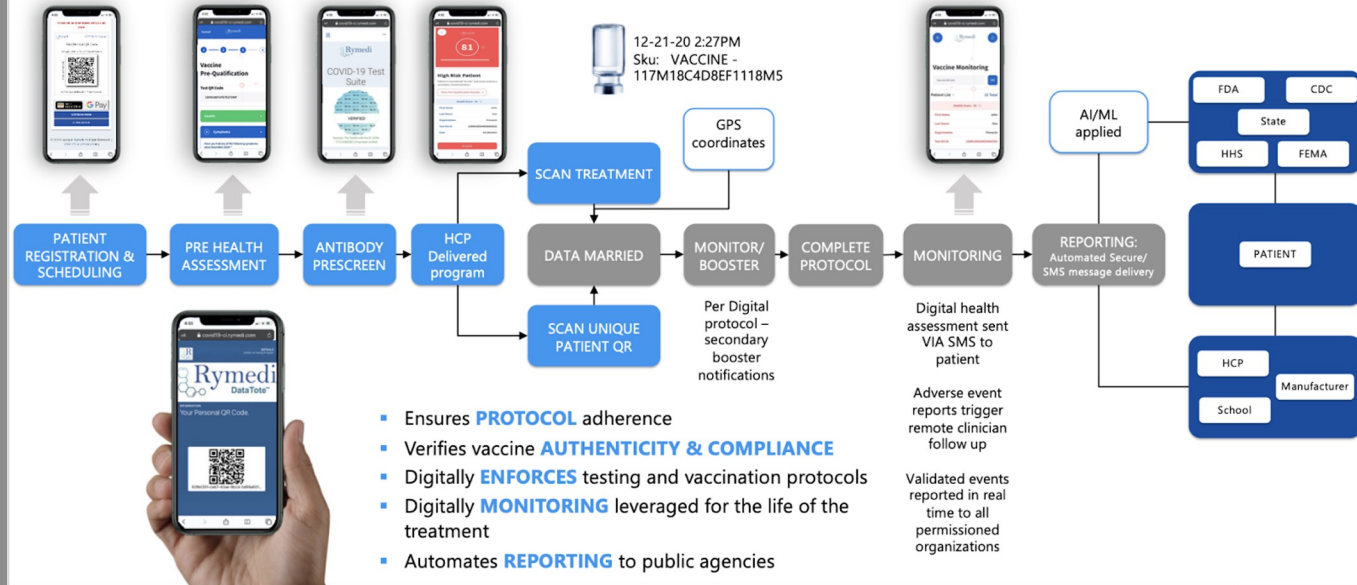
## **5 uses**

- 1. Supply chain
- 1. Decentralized clinical trials
- 1. Credentialing
- 1. Electronic Health and financial Records
- 1. DAOs (professionals, researchers, patients)

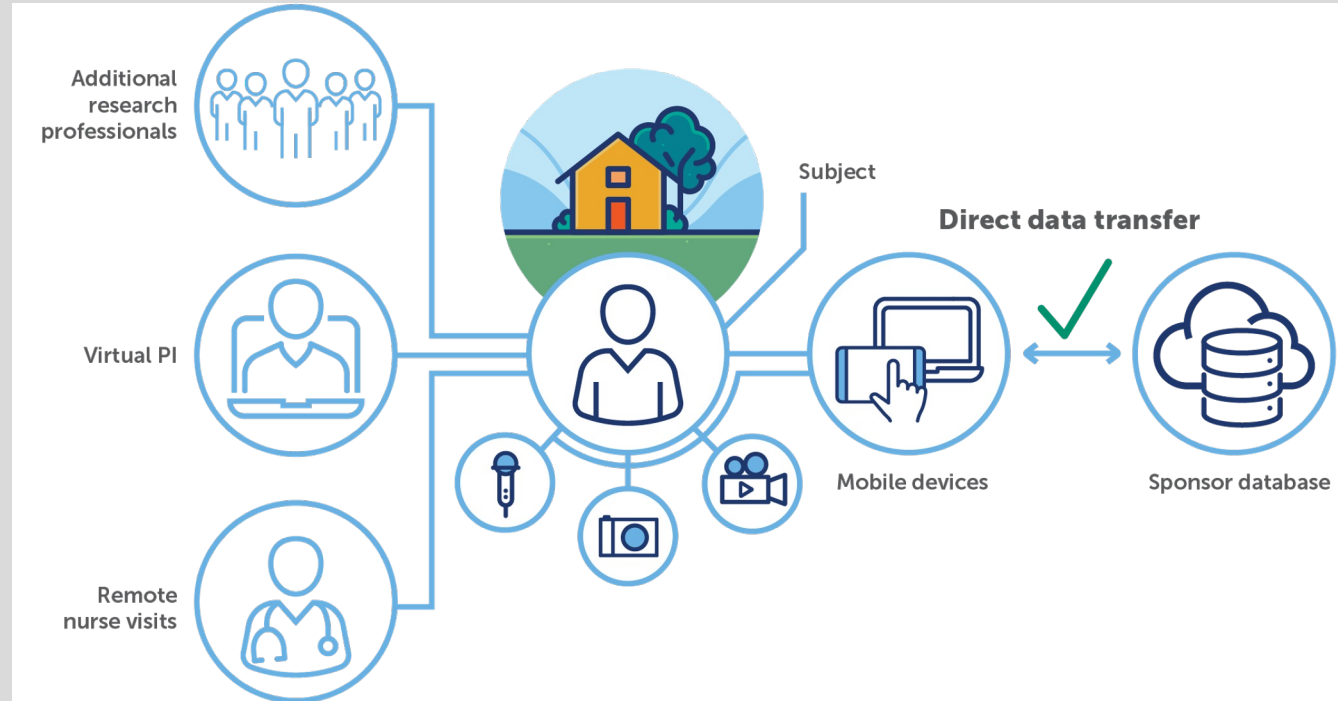
# #1a. supply chain tracking material



# #1b. Value chain tracking people

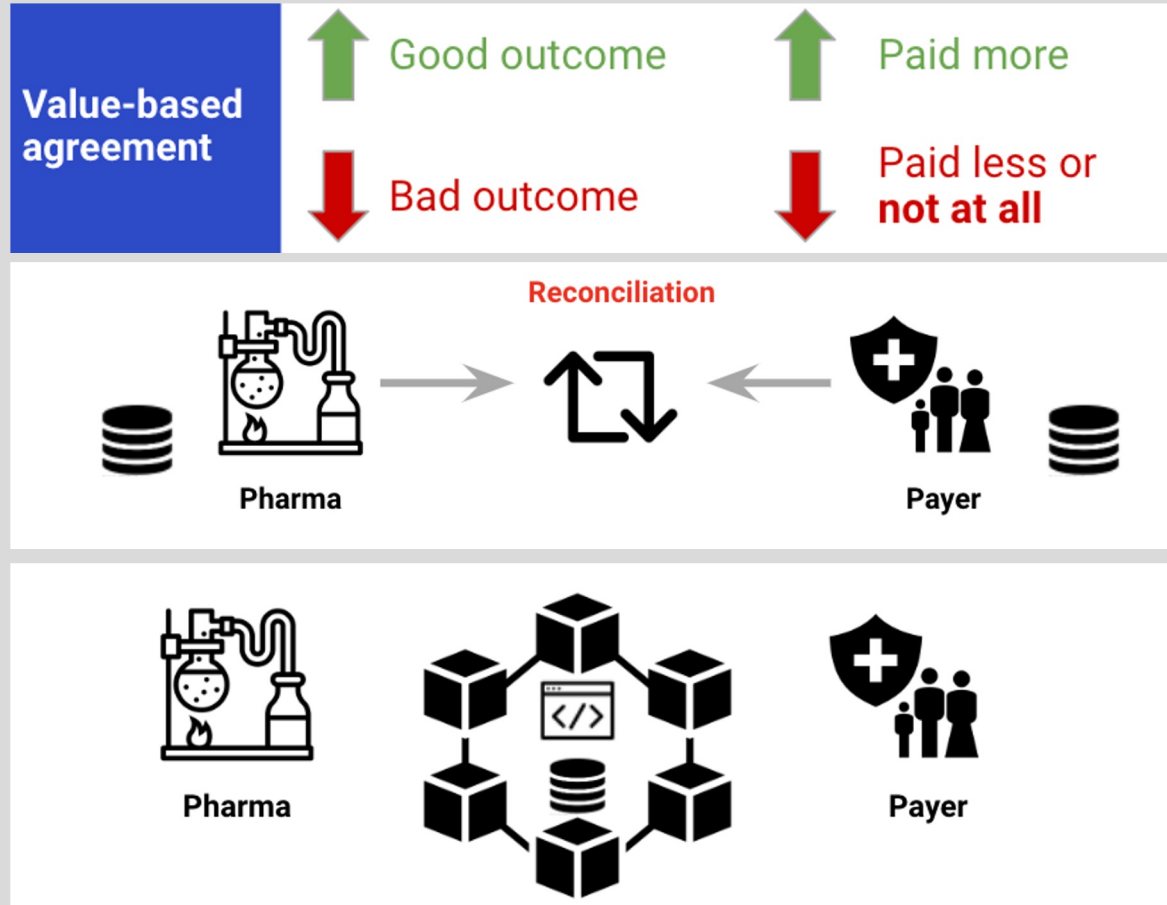


## #2a. Decentralized clinical trials



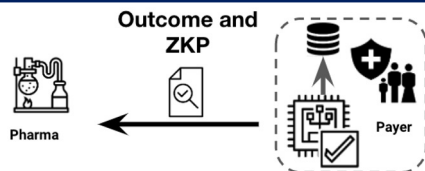


## #2b. Value based agreements



# #2c. Consortia

## IP protection



**synaptic**  
Health Alliance

Announced April 2018; initial focus shared provider data management

**COALESCE**  
HEALTH ALLIANCE

Announced April 2019; initial focus shared accumulator administration

**MELLODDY**

Announced July 2019; initial focus federated learning for drug discovery

**PharmaLedger**  
BLOCKCHAIN ENABLED HEALTHCARE

Announced July 2018; initial focus clinical trials, health data exchange, supply chain

**avaneer**  
HEALTH

Announced January 2019; prioritized use-cases still confidential, launch took place at HIMSS21 in August 2021

**OPTUM**  
**Humana**  
**MultiPlan**  
**Quest**  
**UnitedHealthcare**

**CENTENE**  
Corporation  
**Providence**  
**PRIME**  
HEALTH SERVICES  
**CORVEL**  
**aetna**  
**Cognizant**

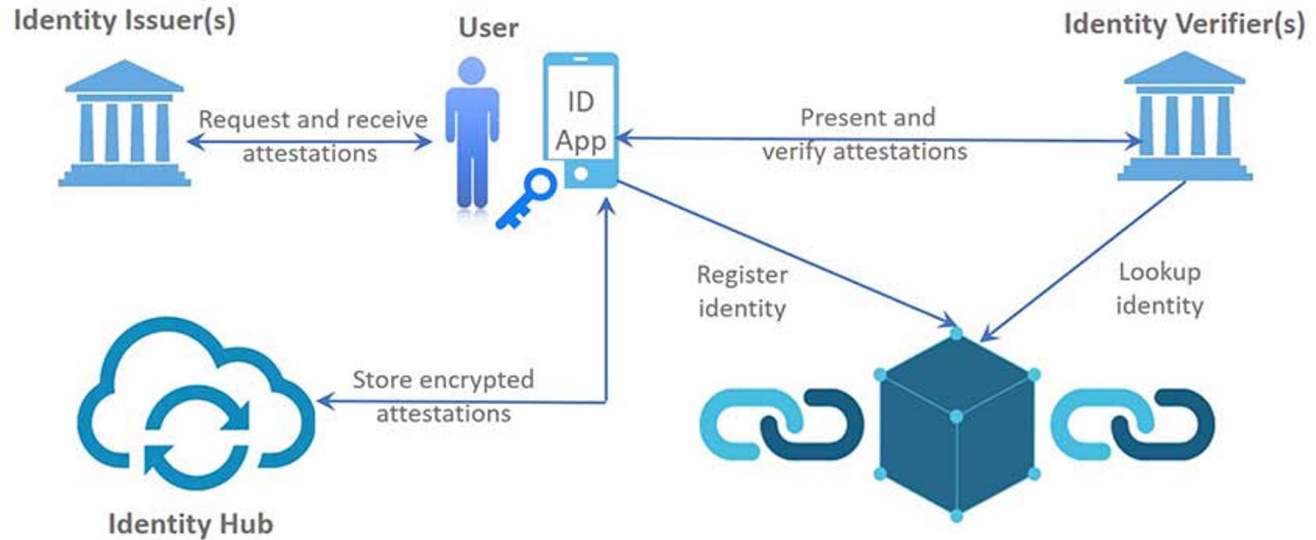
**Blue Cross**  
Blue Shield  
of Michigan  
**EXPRESS SCRIPTS**  
**Horizon**  
Healthcare Services  
**MASSACHUSETTS**  
**NASCO**

**AMGEN**  
**AstraZeneca**  
**NOVARTIS**  
**MERCK**  
**Boehringer**  
Ingelheim  
**JANSSEN**  
PHARMACEUTICA  
**astellas**  
**BAYER**  
**gsk**

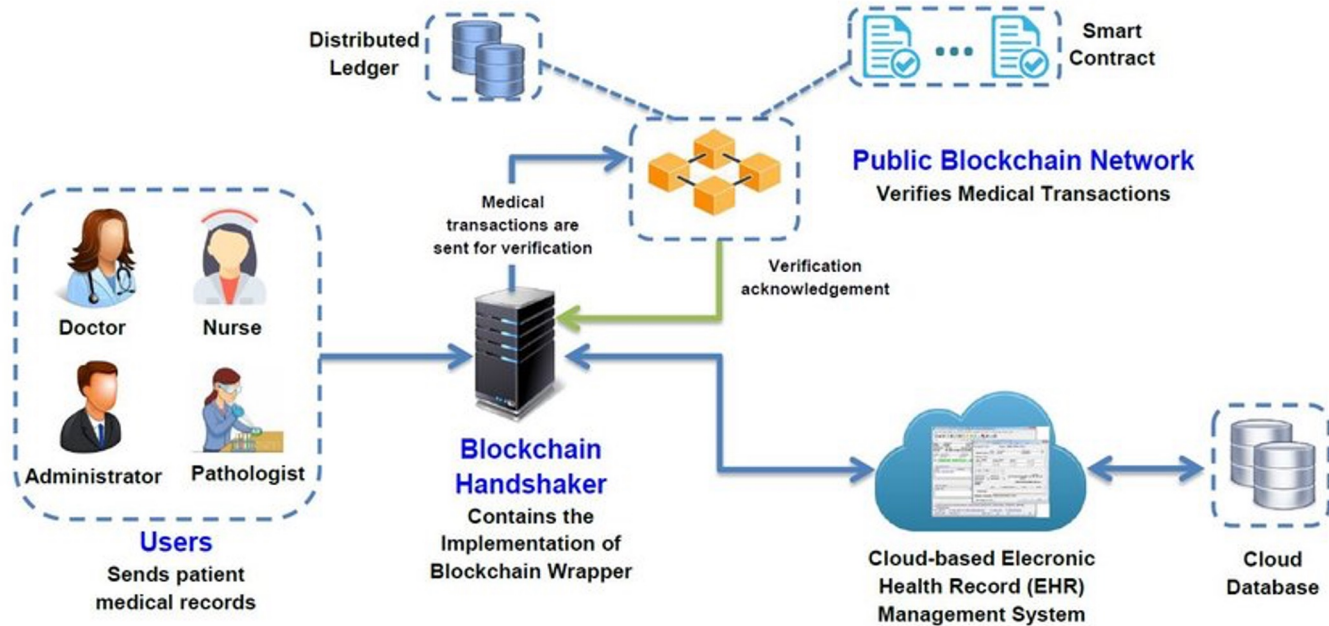
**Pfizer**  
**AstraZeneca**  
**abbvie**  
**SANOFI**  
**NOVARTIS**  
**novartis**  
**MERCK**  
**JANSSEN**  
PHARMACEUTICA  
**ucb** Pharma

**aetna** **CVS pharmacy**  
**HCSC** **IBM** **PNC**  
**Anthem** **SENTARA**  
**Cleveland Clinic**

# #3. Credentials

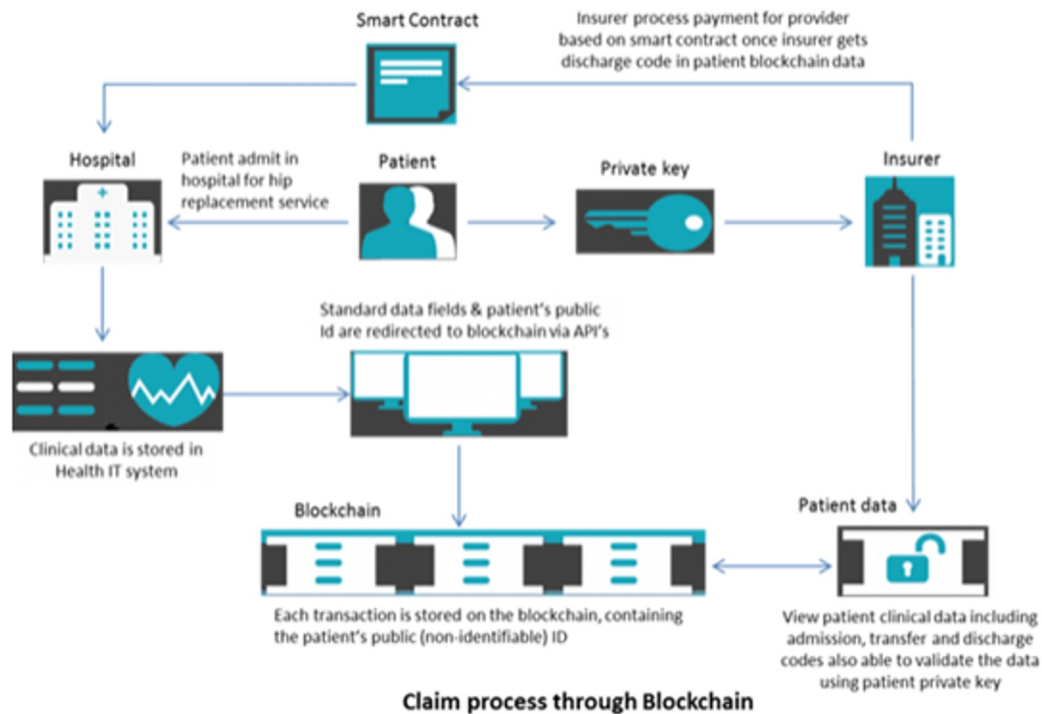


# #4. Electronic Health Records

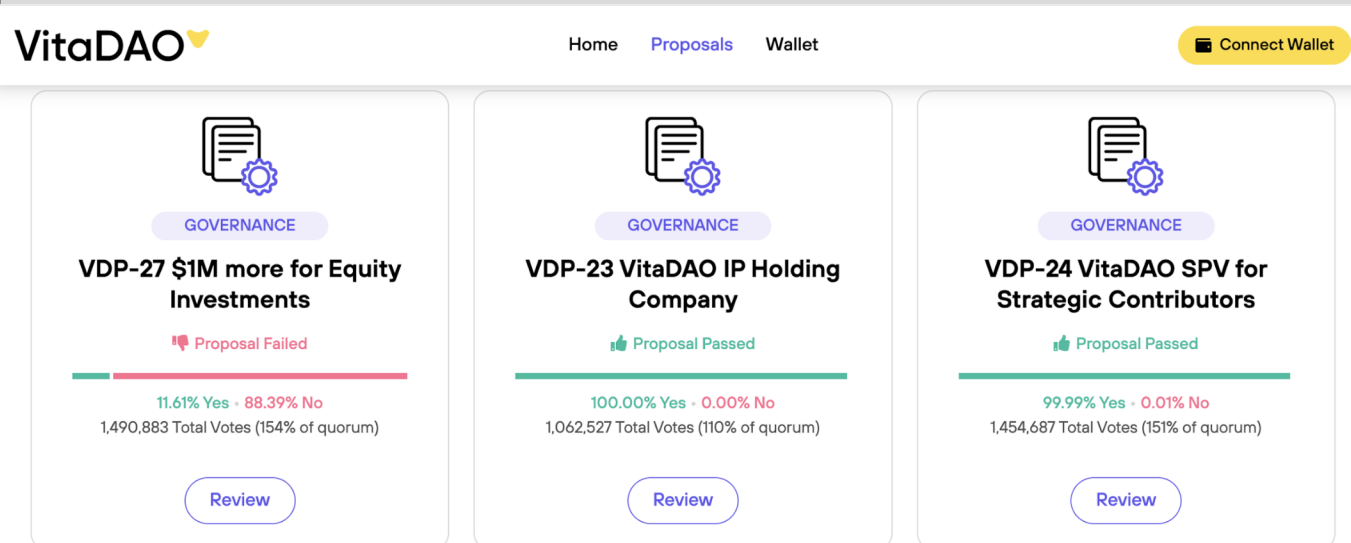


## #4b. Financial records and claims

### Blockchain Prior Authorization/Claims System



# #5a. DAOs



## VitaDAO Results

**\$9m+**

Treasury to fund research

**3000+**

Active Discord members

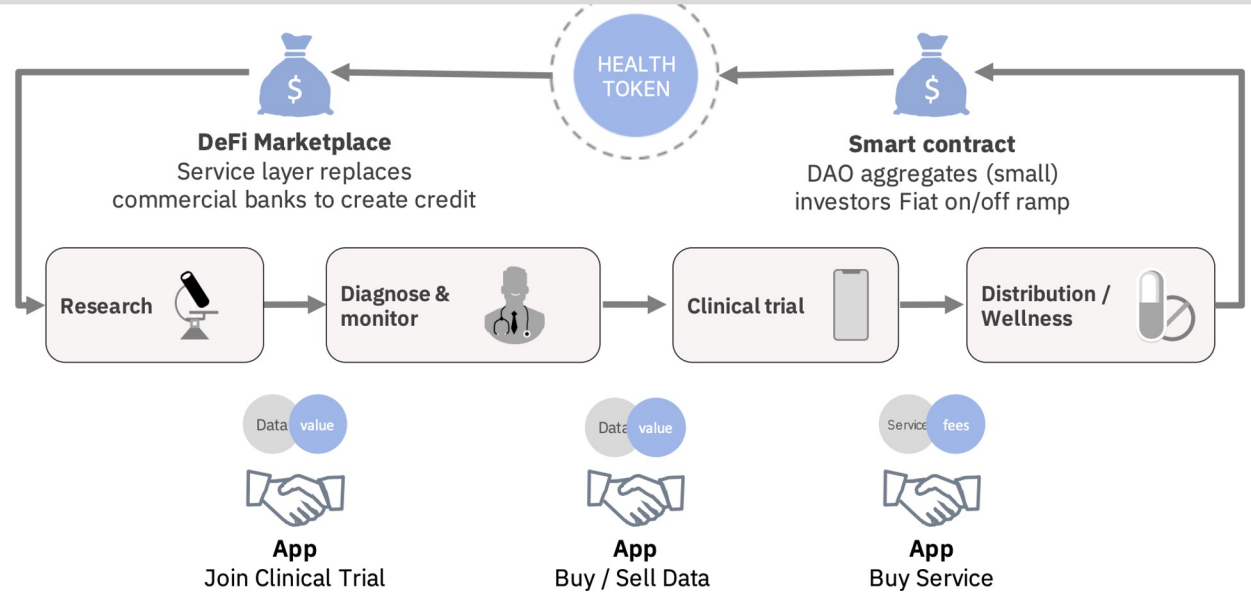
**30+**

Research projects evaluated

**\$1.5m+**

Longevity research funded

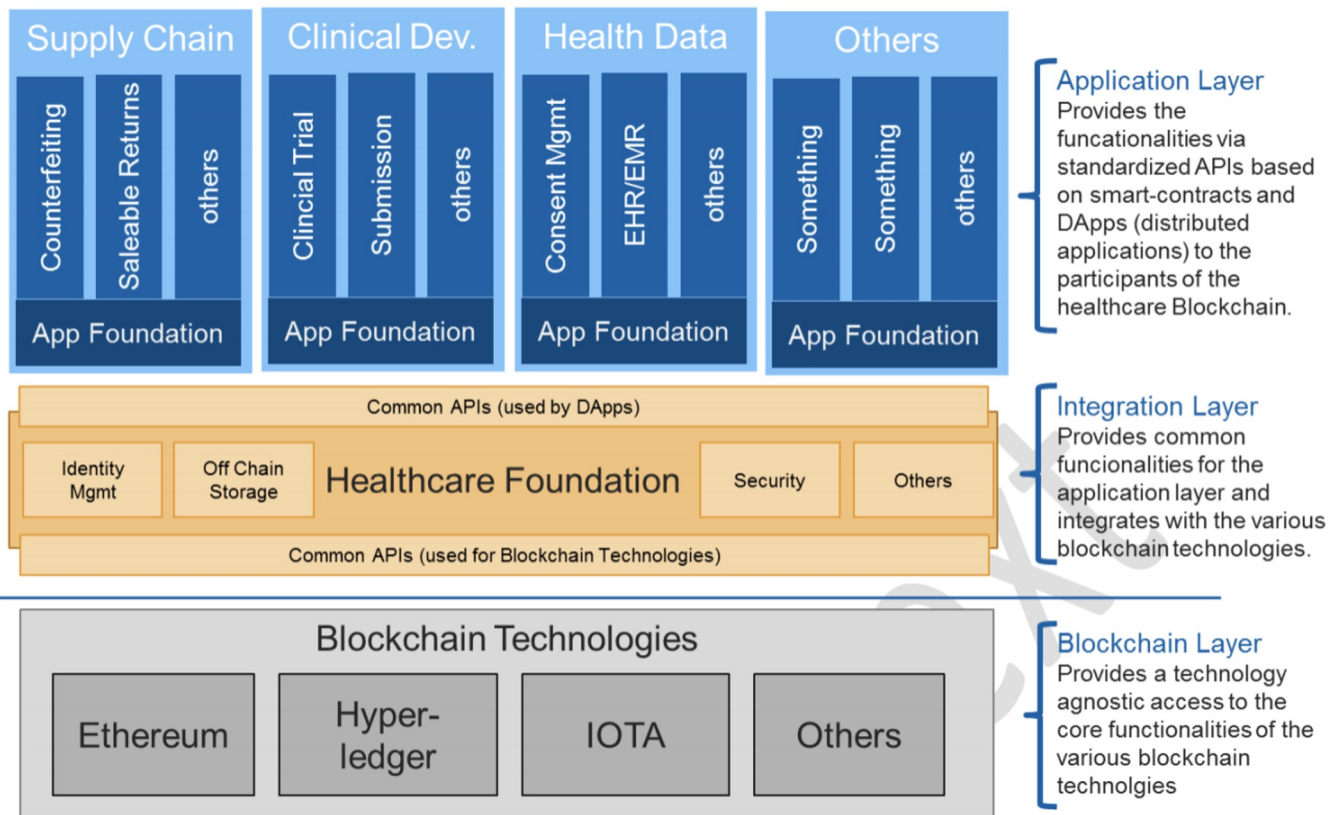
# #5b. Governance as an automated shareholder meeting



Key Tokens

Source, Andy Martin, IBM

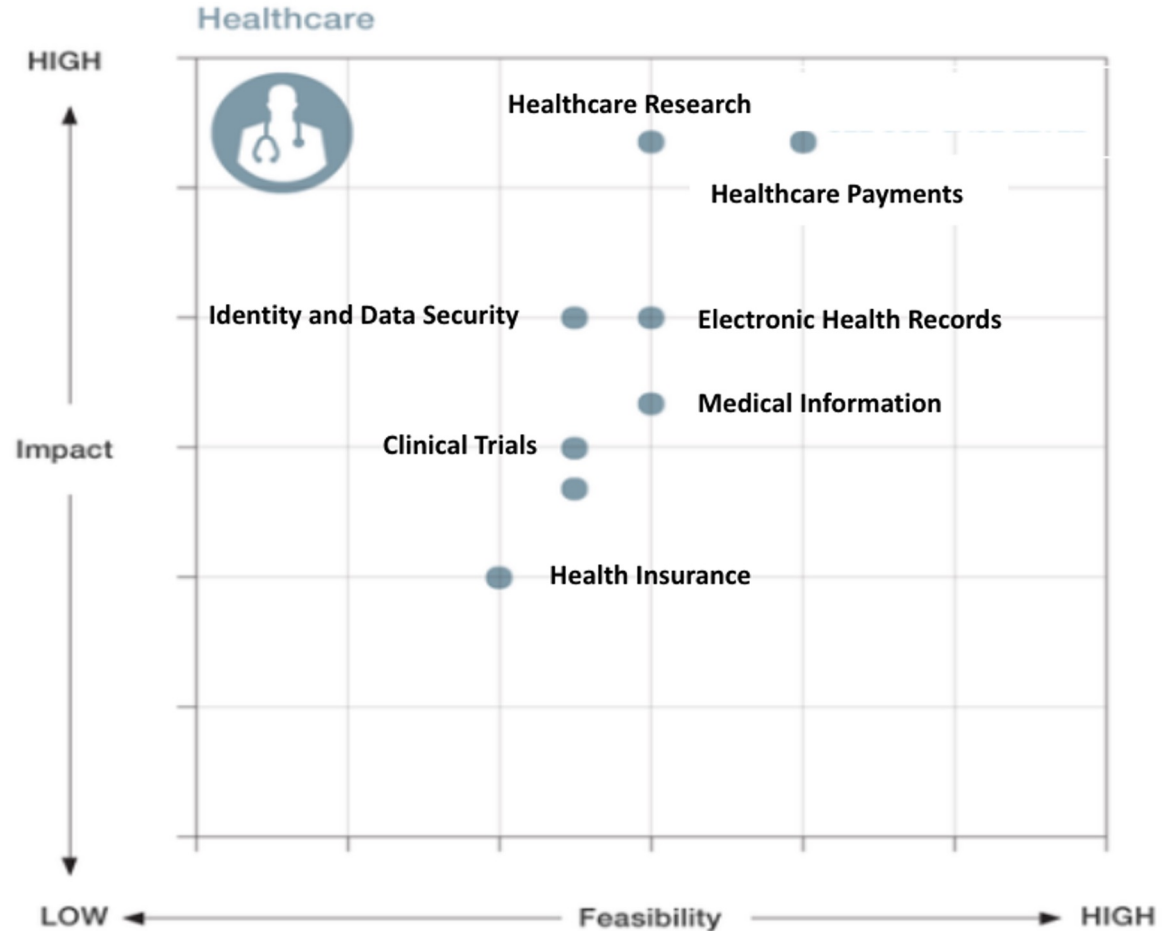
# UI/UX needs to dramatically improve





Future  
implementation  
is uneven

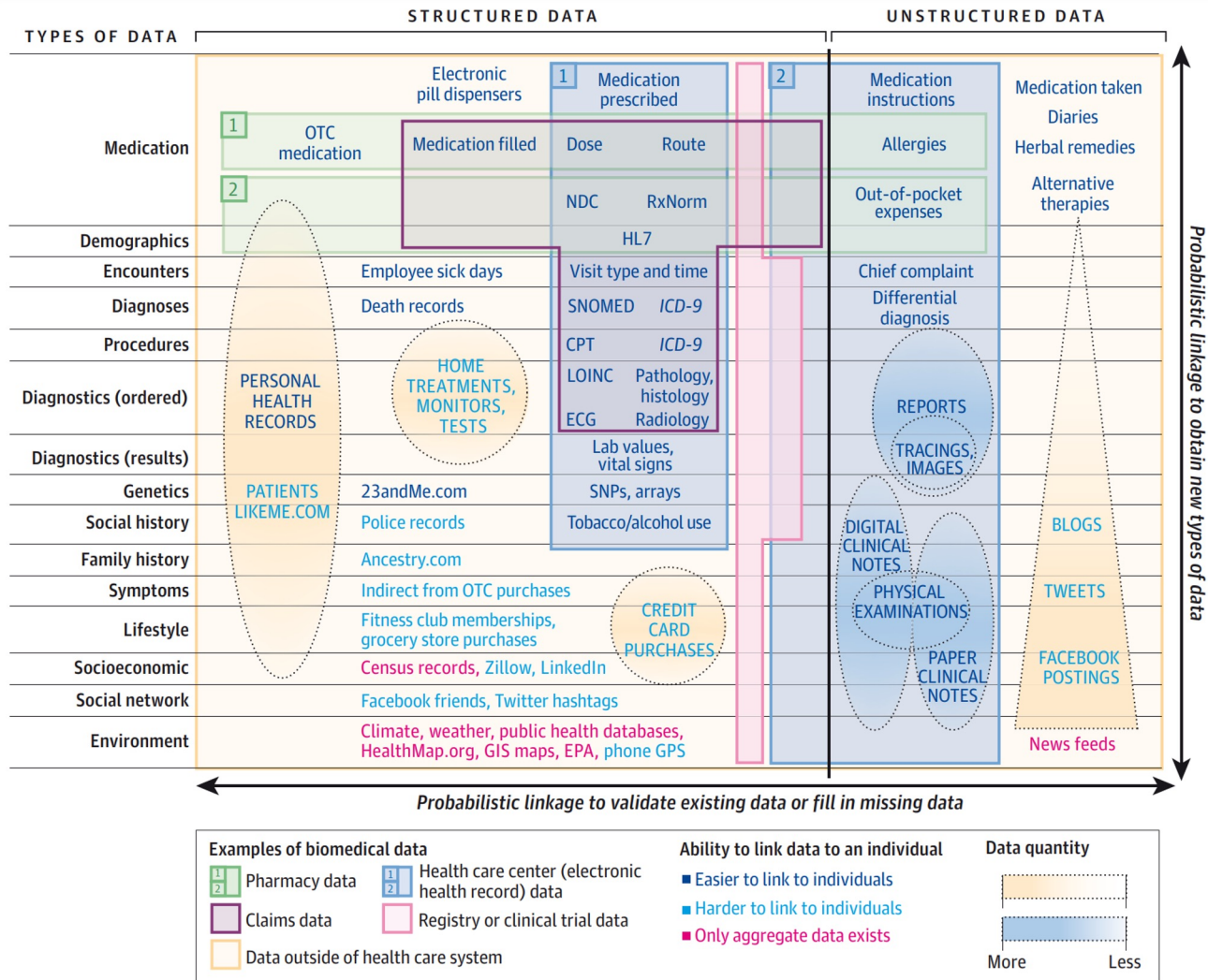
## Blockchain opportunities by industrial sector



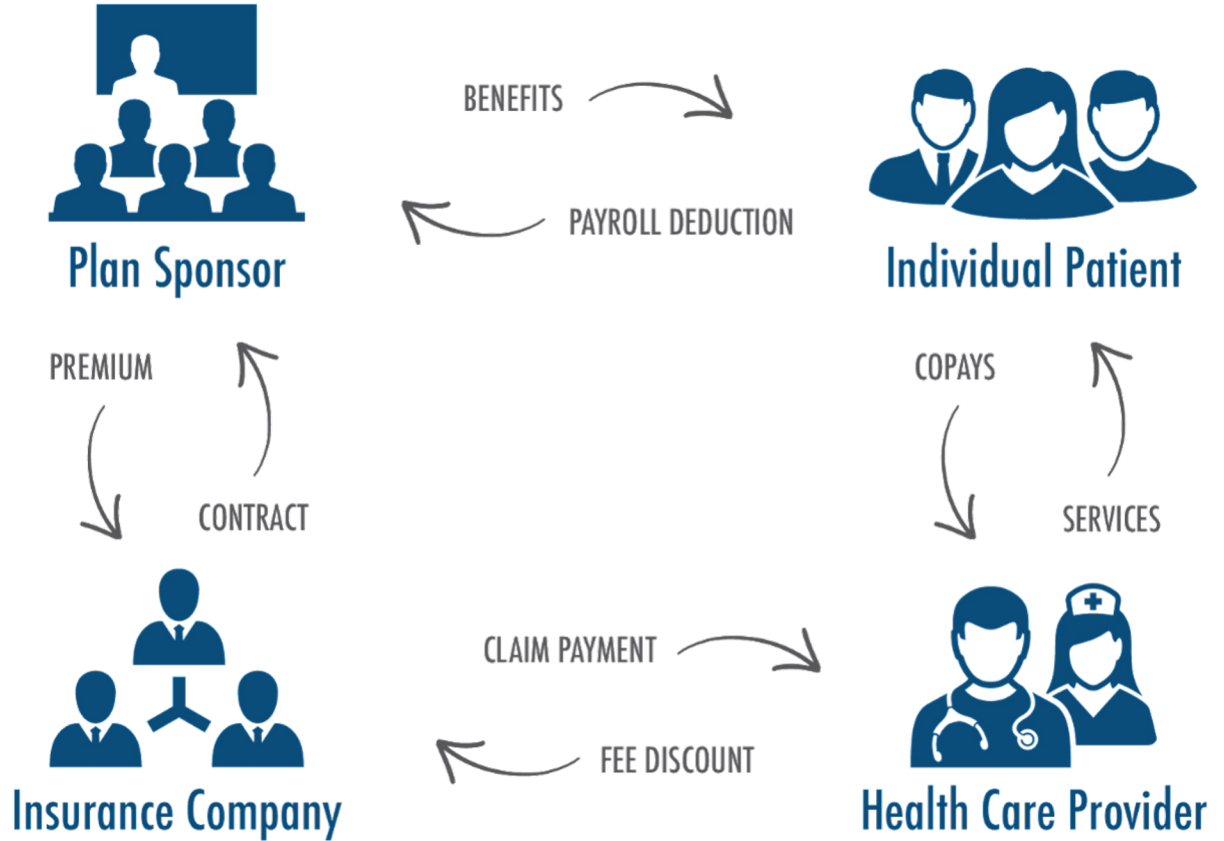
# Lesson 3: Data illiquidity

**BLOCKCHAIN IN HEALTHCARE**

# Healthcare is data rich

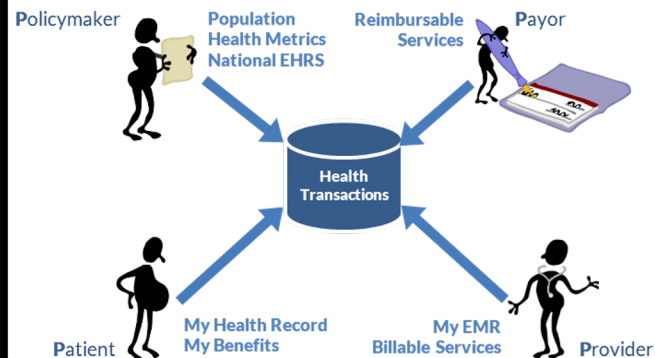
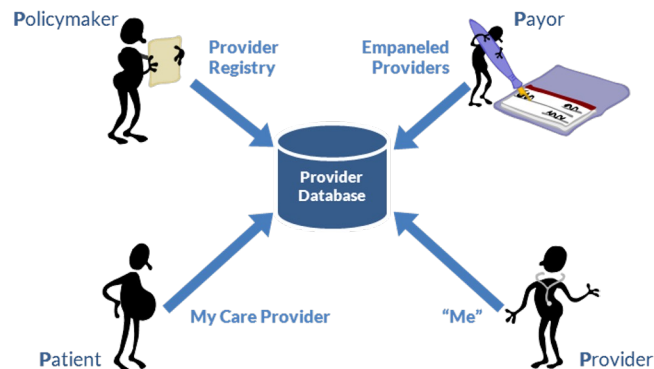
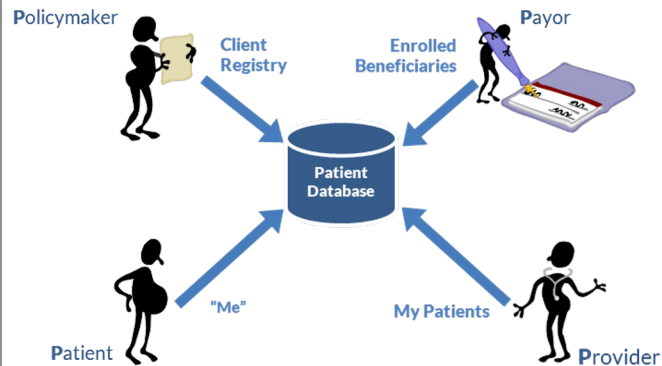


# Current stakeholders

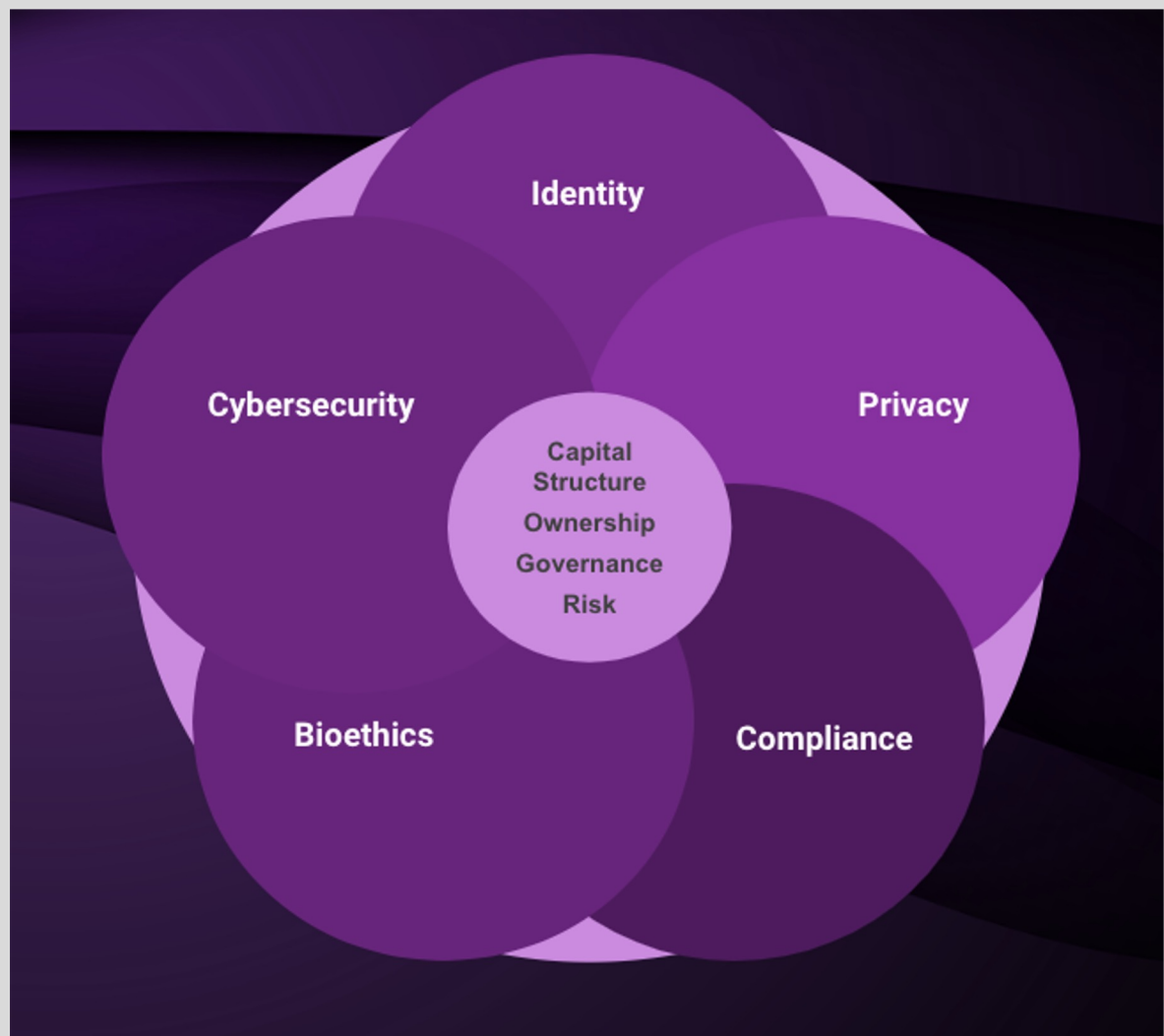


# Data silos

No  
interoperability  
No inter-  
cooperability



# Barriers to implementation



# Health 3.0 stack

Decentralized Apps (“dApps”)  
*Web3 User Experience*

Optional Tokenized Assets  
*Secured and Transferred*

Smart Contracts  
*Secure Automation Across  
Organizational Boundaries*

Blockchain Networks  
*Public, Private, and Hybrid*

## Privacy-in-Depth

- Zero-Knowledge Proofs (ZKPs)
- Trusted Execution Environments (TEEs)
- Secure Encrypted Virtualization (SEV)
- Blind Computation
- Verifiable Computation
- Secure Multi-Party Computation
- Differential Privacy
- Homomorphic Encryption
- Quantum-Resistant Encryption

## Decentralized AI

- Federated learning in blockchain networks
- Intelligent agent-based automation
- Optimization w/agent-based simulation
- New paradigm in training data provenance

Web2 □ Today's Mainstream Modern Web

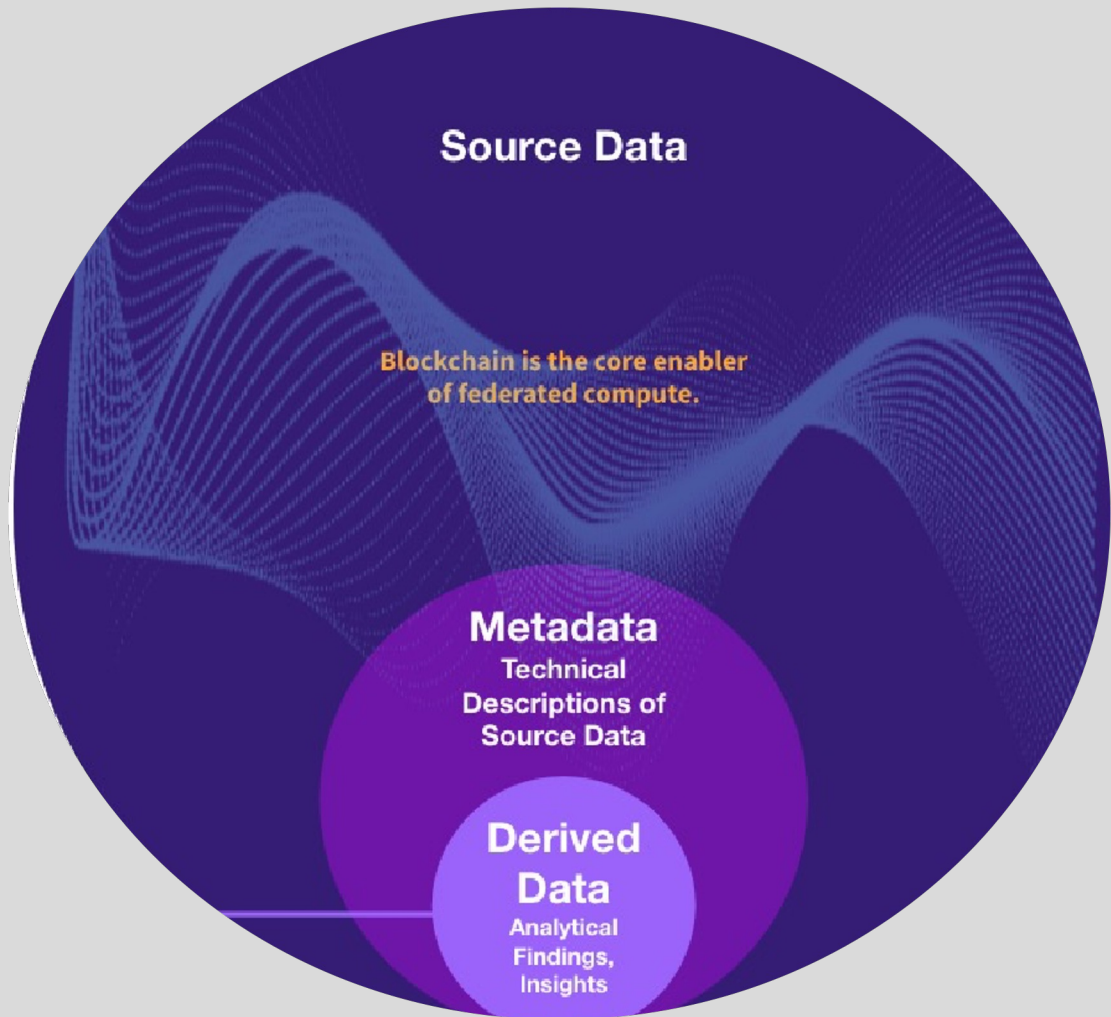
# Lesson 4: AI/ ML/ FL

## BLOCKCHAIN IN HEALTHCARE

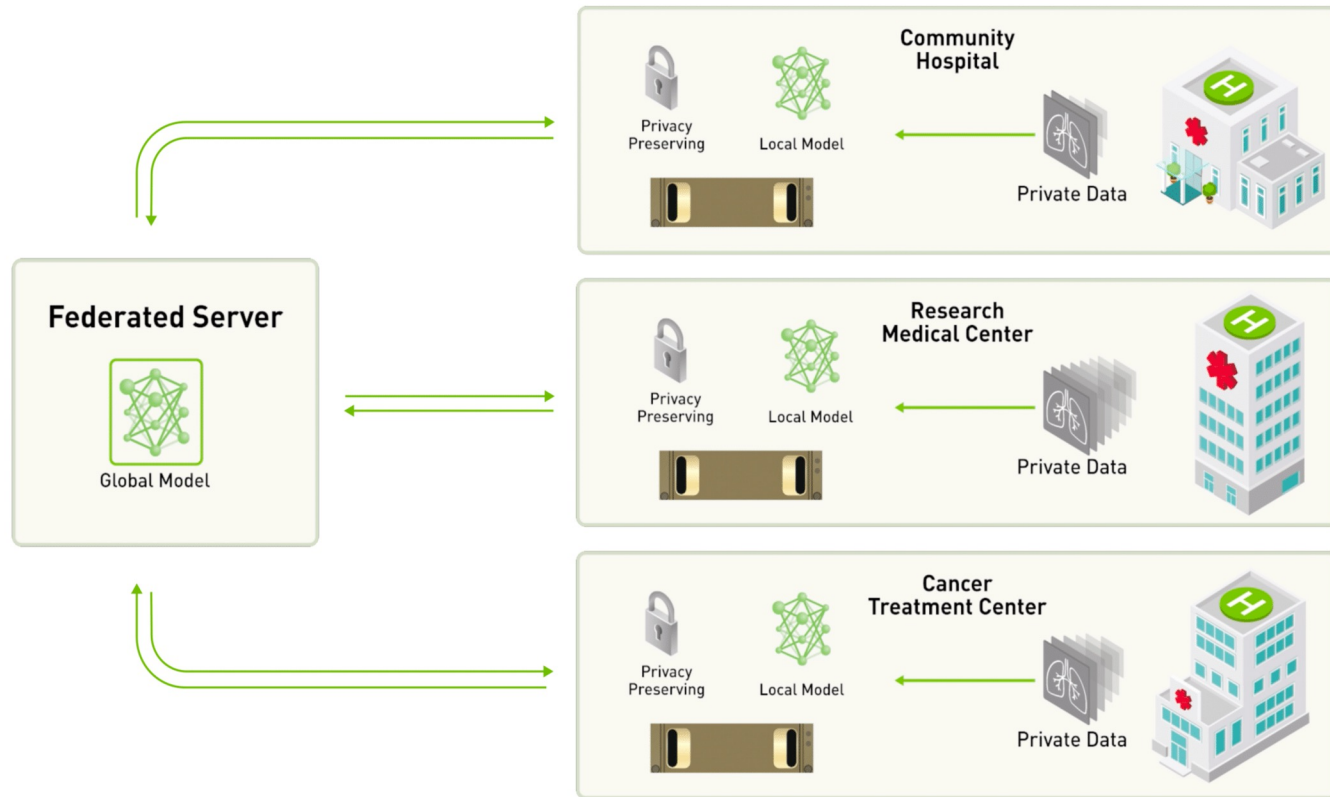


$$V=Q/C$$

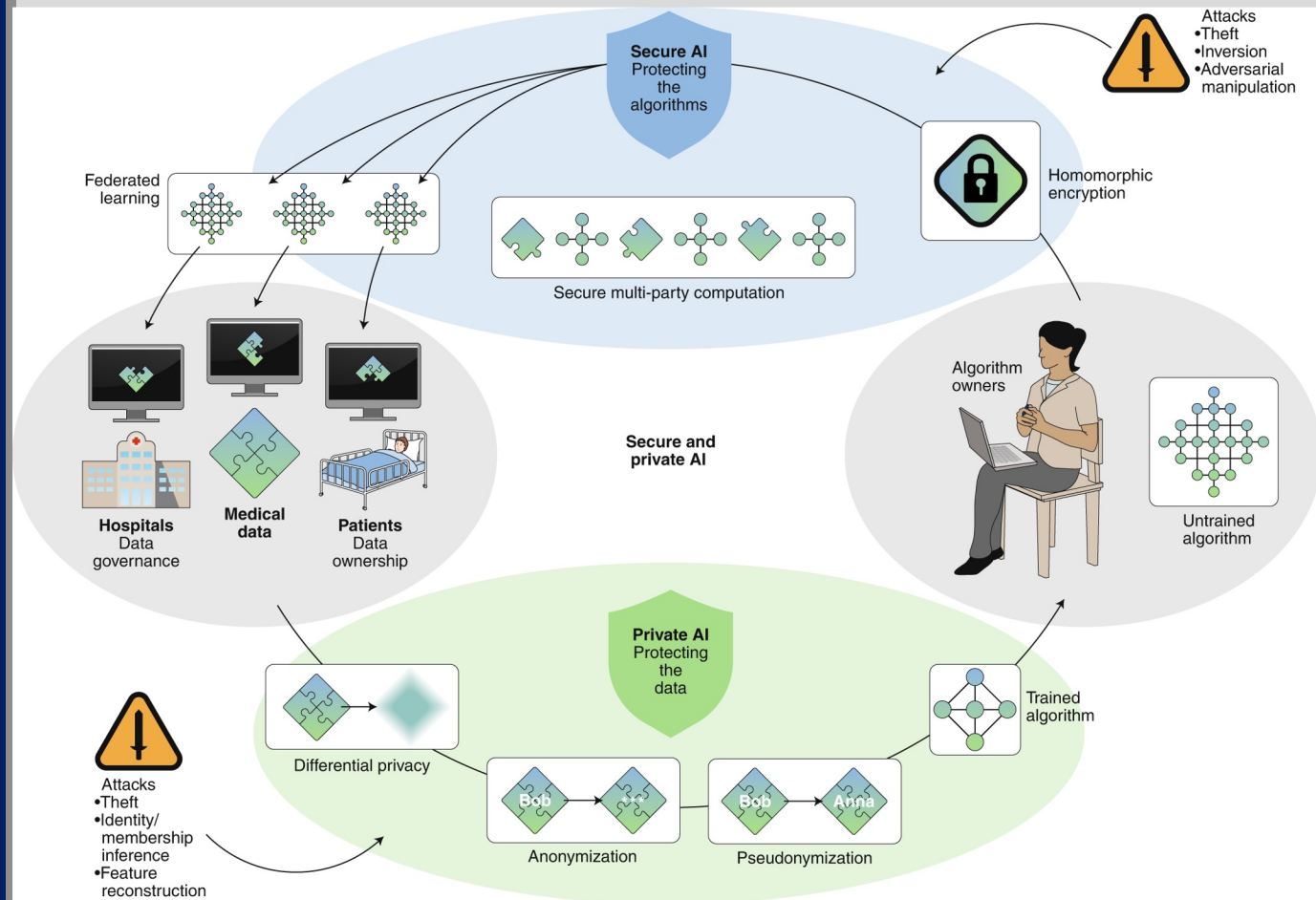
**Q = derived  
data**



# Federated Learning



# MPC and privacy preserving technology



# Lesson 5: Tokenization

**BLOCKCHAIN IN HEALTHCARE**

# coin vs. token



A coin is a digital currency similar to the physical currency

Coin operates on its own blockchain with its own protocol

Coins are purely used as a source of payments

For e.g. Ripple and Ethereum

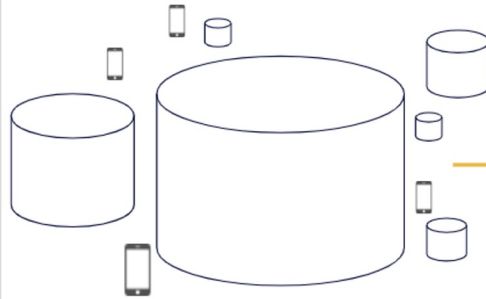
A Token is a digital asset issued on a particular project

Token does not operate on their own blockchain

Tokens are used for payments and signing digital agreements

For e.g. BON and DAO token

# Paradigm shift



From Data Silos...




...to Incentivized Collaboration

# How does a token look like?


- Name\*
- Address\*
- Time At Address
- Date of Birth
- Utility Bills

**m-KYC Attested (8)**




- Name
- Home Town
- email Address
- Phone Number
- Social Media Handle

**m-Contact Info (4)**




- Exercise Activity – Month
- Calories Burned – Month
- Steps Taken – Month
- Distance Covered – Month

**m-Exercise (2)**




- Income
- Outgoings
- Savings
- Credit card balances
- Loans
- email address

**m-Budget (7)**



- Purchases
- Bill Payments
- Direct Debits
- Standing Orders
- Charges
- Loan payments

**m-Spend (7)**



- Car Lease/HP Payments
- Car Insurance Payments
- Car Service Payments
- Fuel & Parking Payments
- Ride Share Payments

**m-Mobility Spend (3)**



- Savings
- Shares
- Crypto
- ISA
- Pension

**m-Investments (7)**




- Name
- Age
- Profession
- Post Code
- Medical conditions

**m-Health Insurance (7)**



- Post code
- Home type
- Marital status
- Family status/size
- Attested assets value

**m-Content Insurance (6)**

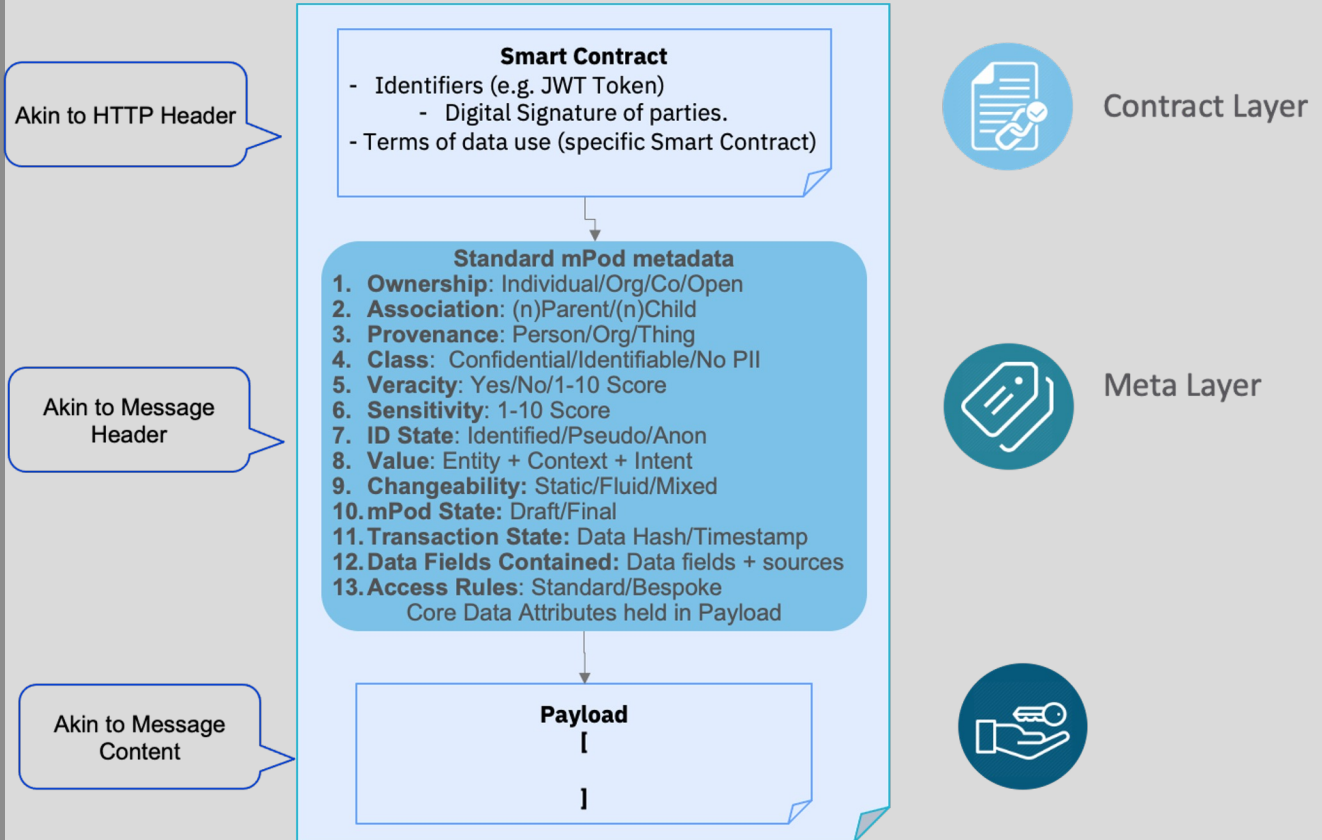


- Gender
- Age Group/Range
- Profession
- Marital Status
- Location
- Health Risks

**m-Archetype (4)**



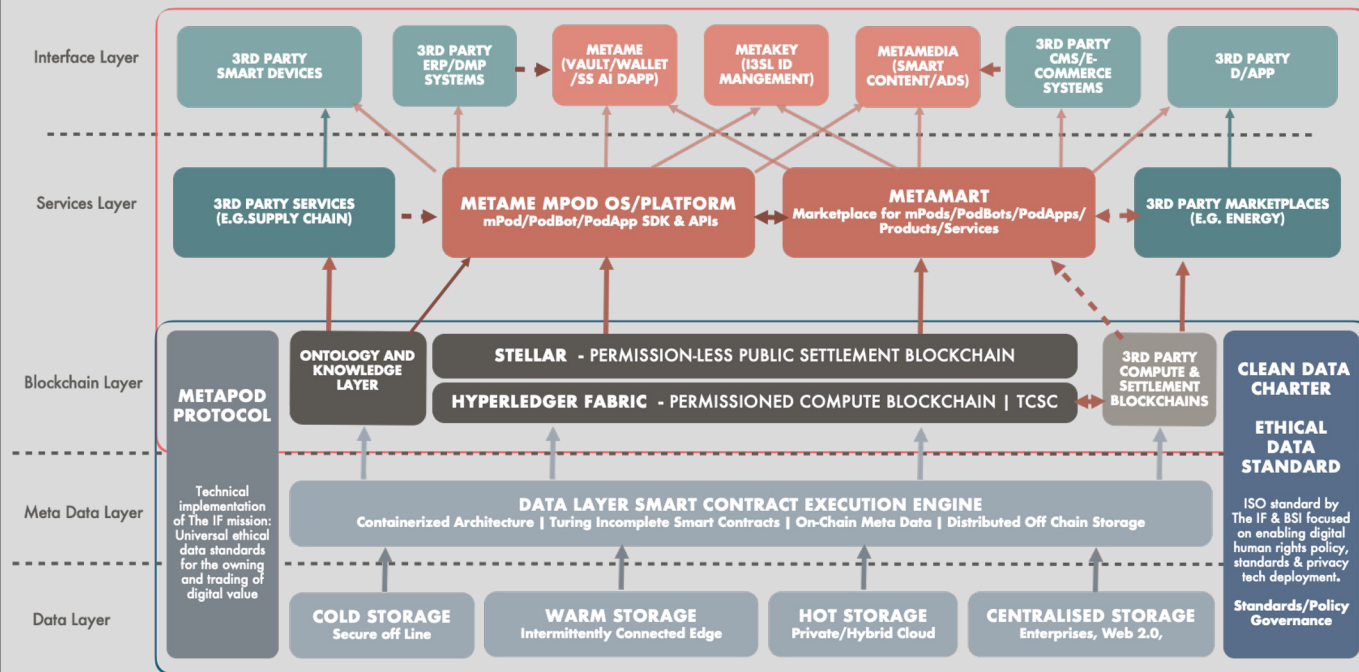
# Smart contract



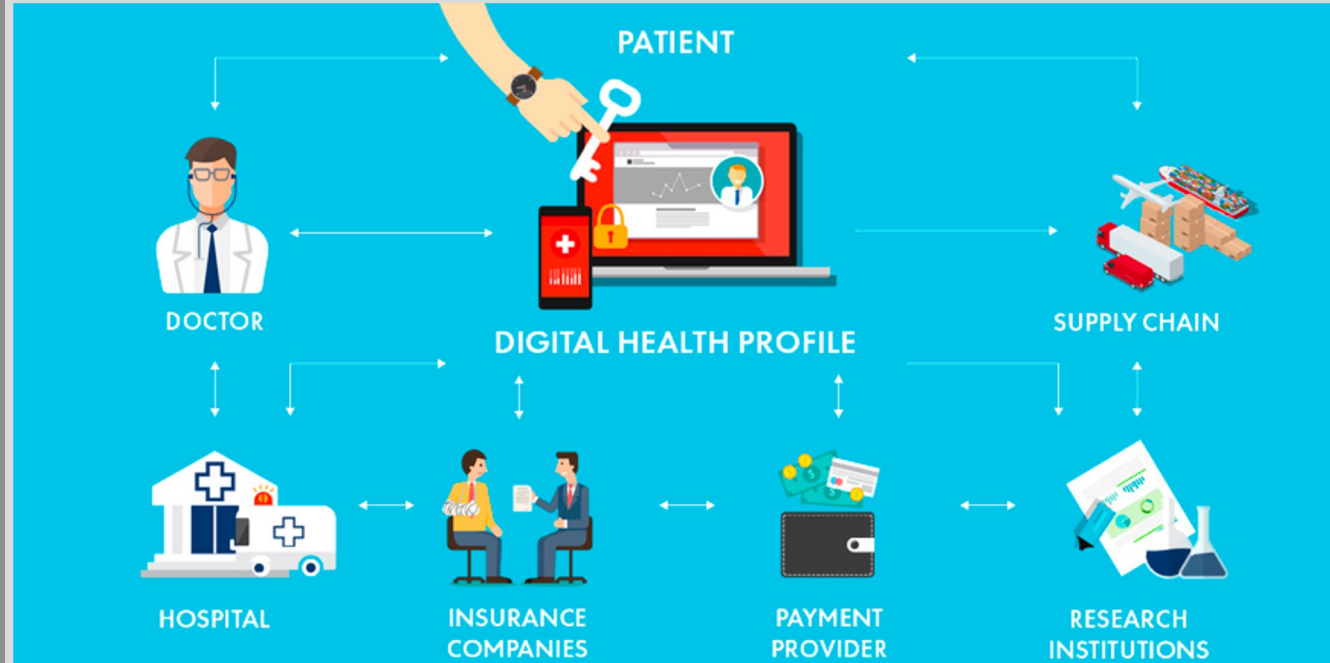


# Settlement Layer

## “Programmable Money”

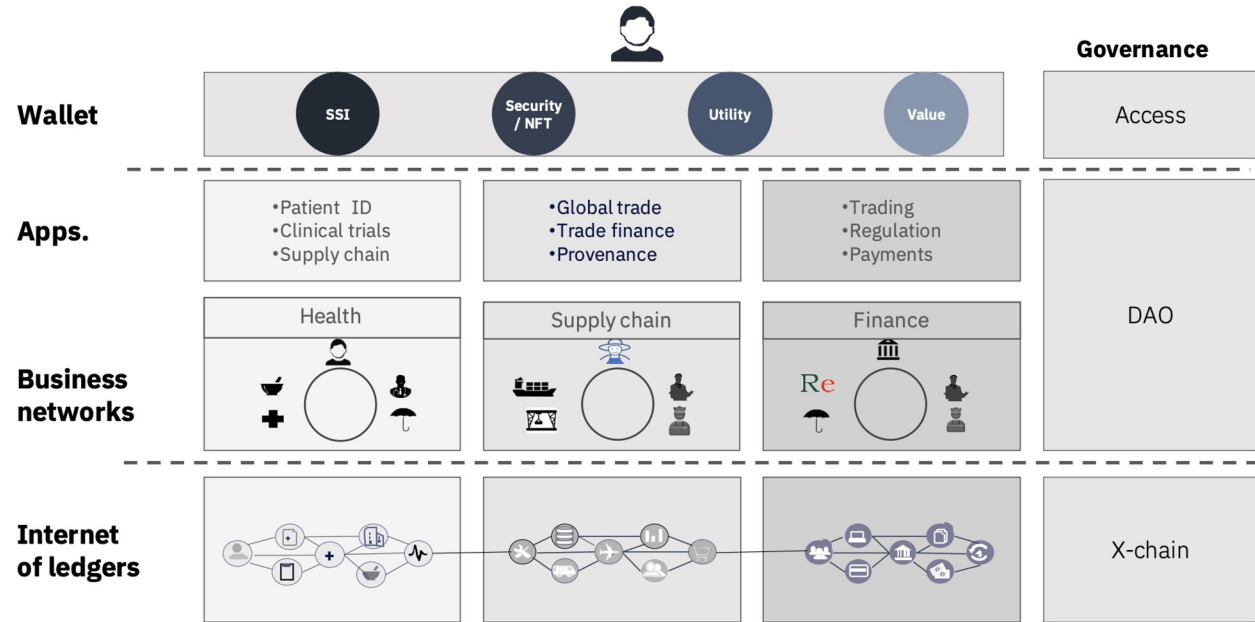


Unique =  
NFT



# Prepare for a multi token world

Alex MD  
Alex patient  
Alex traveler  
Alex investor...



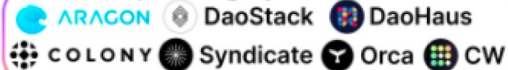
# DAO

## Internet native communities

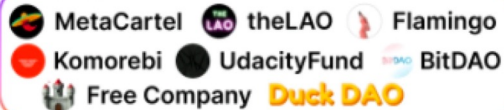
### DAO LANDSCAPE

Curated by @Cooopahtroopa • Pixels by Carlos/

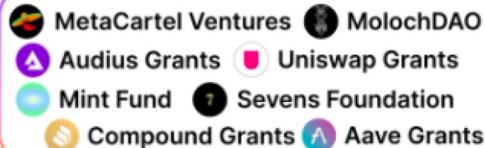
#### DAO Operating Systems



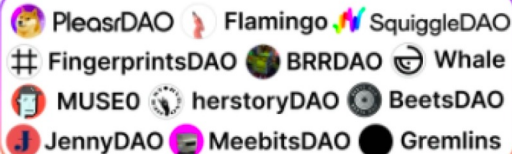
#### Investment DAOs



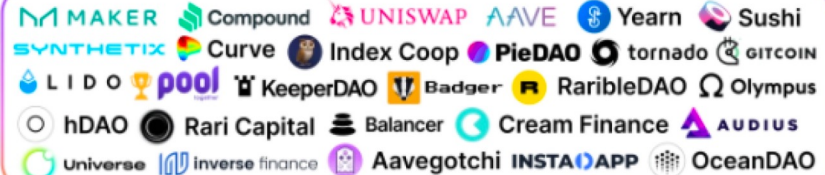
#### Grants DAO



#### Collector DAOs



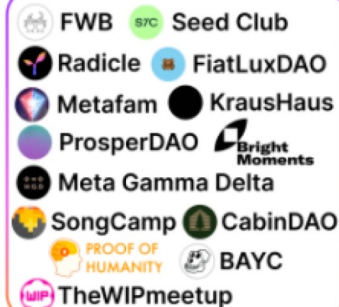
#### Protocol DAOs



#### Service DAOs



#### Social DAOs



#### Media DAOs



Source:Twitter

# Summary

## **BLOCKCHAIN IN HEALTHCARE**

# Health 3.0 is all about ownership

- 1. You are your data and that data is yours
- 1. Your data is valuable in a tokenized asset
- 1. New value can be created in DAOs (network effect)
- 1. DAO behaviors are governed by tokens
- 1. Token value may stay in the DAO or converted to fiat

# Data is dignified labor

Issue	Data as Capital	Data as Labor
<i>Ownership</i>	Corporate	You
<i>Incentives</i>	Opaque	Transparent
<i>Future of Work</i>	Shared (gig)	Data work
<i>Reputation</i>	Social media	Digital dignity
<i>Social contract</i>	You are the product	Creator economy

## Still unanswered questions

### Will we have Universal Health Income? (UHI)

Who is accountable for shared infrastructures? If their creation can't be led solely from the public sector, how can we align industry, academia, and philanthropy?

If multiple consortia need to be engaged, how do the *consortia* coordinate among themselves?

How do we validate the sustainability and effectiveness of differing governance, cybersecurity, and ownership structures?

What are we 'owning and governing'?

1. Capital
2. Risk
3. Technology
4. Data
5. Intellectual Property



# WAGMI !!

Banking

Web 2.0



Revolut, Transferwise



Web 3.0



Trustwallet

SMS



Messenger, iMessage



Discord, Telegram, Outgrid

Content



Medium, Patreon, YouTube



Steemit, Rally

Browser data



Safari, Chrome



Brave, Swash

Ownership



Bill of Sale



Open Sea, Dapper Labs

File storage



Dropbox



IPFS

Payments



Venmo / Paypal



Outgrid, Trustwallet, Celo

Gaming



Second Life



Decentraland



by InstigationProtocol.com

# QUESTIONS & ANSWERS

**BLOCKCHAIN IN HEALTHCARE**