



Innovation, Technology and Societal Context in the Token-Based Web3

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TU Delft, Technology Dynamics (MOT113a), 30.05.2024 Delft

- This presentation reflects the personal views of the author and can under no circumstances be interpreted as an official position of the European Commission. -

Web3 and Tokenisation

Web3 is a digital space where communities create and safely transfer value based on a prior agreement on their mutually acceptable **belief system**.

Tokens are the carriers of such values and act as connectors between the offline and online worlds in increasingly integrated metaverses.

These tokens can be interpreted as **containers** carrying social norms.

Tokenisation creates an **opportunity space** for the real economy (industry, start-ups, cooperatives/DAOs), in which finance is embedded as a functional tool.

Social Context of Technology

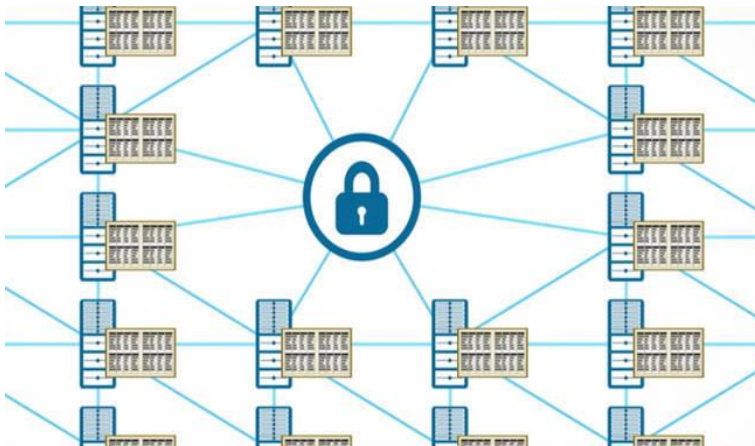
Distributed Ledger Technology (DLT/Blockchain) is much more than a technology: it is a social revolution, which enables communities to safely scale self-organised (belief) systems.

Such self-organisation through proximity (offline and/or online) is in the DNA of humanity.

As such, blockchain allows for a bottom-up approach and becomes the key enabler of a decentralised, more inclusive and democratic society.

➔ **“Token Economy”**

What Is a Blockchain?



- Record-keeping in decentralised, dynamic and encrypted databases within a peer-to-peer-network;
- Origin: 2008 Bitcoin blockchain;
- Manifold applications in finance and the real economy (IoT, supply chains, property registers, e-voting, ...);
- Disruptive potential ...
- ... but importance of properly designing initial conditions

Graphics: http://www.theregister.co.uk/2016/02/18/ibm_open_sources_blockchain_code/

What is a Token?

- **Tokens** are representations of rights and obligations usually related to an underlying asset or bundles thereof.
- They **enable value creation and transfer** within communities governed by socially accepted rules.
- There are **offline and online examples** of tokens. An offline example is a plastic coin that represents a monetary value in a concert hall or sports stadium.
- Also think e.g. of the “Yap island stone money”: tokens emerged millenia ago.

Example: Yap Island Stone Money



STONE MONEY OF UAP, WESTERN CAROLINE ISLANDS.

(From the paper by Dr. W. H. Furness, 3rd, in 'Transactions, Department of Archæology, University of Pennsylvania, Vol. I., No. 1, p. 51, Fig. 3, 1904.)

Tokens in the Digital Space

In the digital space, tokens are usually **based on trustworthy technologies**, i.e. DLT/blockchain.

We often call them **crypto tokens**, although numerous alternative definitions are in place (e.g. crypto assets, digital assets).

Tokens do not need to primarily have financial functions; indeed, financial functions can be ancillary or non-existing in token-based schemes.

As noted, finance/payments/money is a mere subset of value. It has a **normative nature** that reflect belief systems (note that this also applies to fiat money).

Concepts: Nothing of this Is New

Blockchain is based on **ledgers**, i.e. records of timestamped transactions. They have existed offline since centuries.

Tokens (as we saw) are even older. Our ancestors just did not call them so.

Decentralised autonomous organisations (DAOs) are online forms of offline cooperatives. Think of e.g. local banks (Raiffeisen) or (the tragedy of) the commons)

Digital finance is crowdfunding 2.0. It existed offline long ago but also online before anyone called it “crypto”.

What Is Crowdfunding?



- Crowdsourcing/-funding/-innovation central to collaborative economy;
- Benefits beyond pure financing;
- Starting point for decentralised company/organisation/network development;
- More information:
https://ec.europa.eu/growth/tools-databases/crowdfunding-guide_en

Tokenisation Creates Opportunities in Finance ...

SME Financing

- Initial Coin Offerings
- Tokenised bonds, shares, deposits etc.



Financial inclusion

- Digital wallets on mobile devices
- P2P lending at local level



Global competitiveness

- SME online market access
- Crowdsourcing of inputs

Programmable payments

- Smart contracts-based Web3 payments
- M2M (micro-)payments

Tokenised ecosystems

- Value-chain management
- Digitalisation of industries



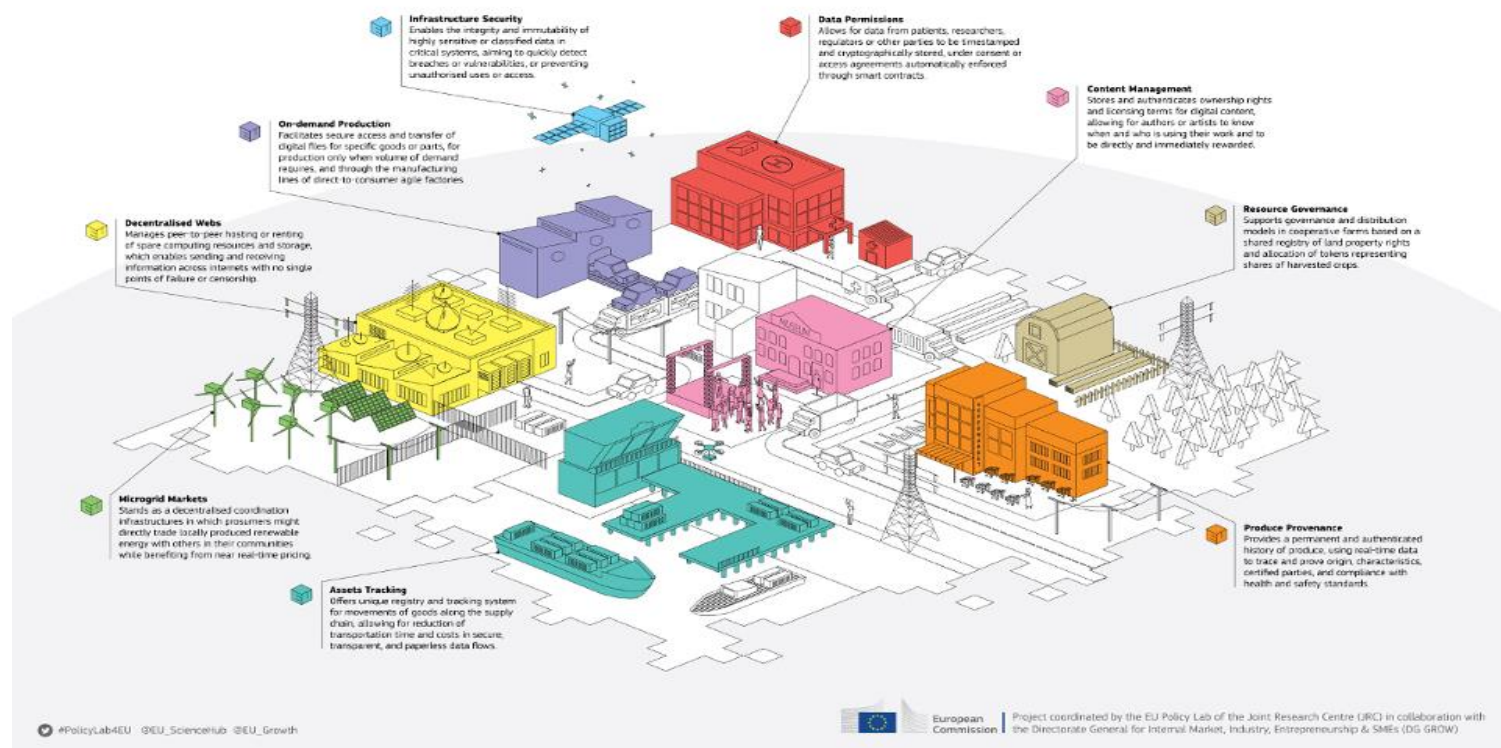
New (global?) currencies

- CBDCs
- Private stablecoins

... as well as for Industrial Ecosystems ...

#Blockchain4EU Blockchain for Industrial Transformations

Blockchain and other Distributed Ledger Technologies enable parties who are distant or have no particular trust in each other, to record, verify and share digital or digitised assets on a peer-to-peer basis with few to no intermediaries.

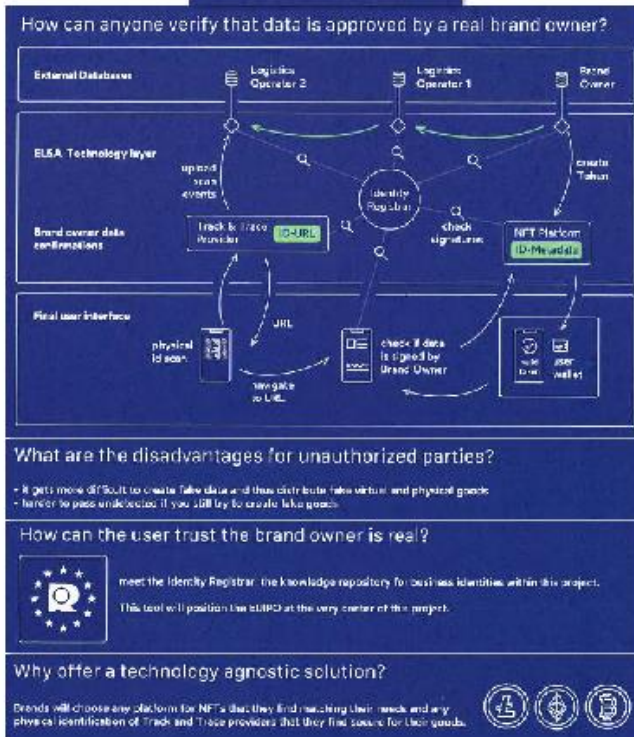


... and Value Chains



WINNING DESIGN HIGHLIGHTS

ELSA authentic goods and shipments



ELSA: a versatile and innovative open source blockchain infrastructure design aiming to ensure sharing of authenticated shipment and product data through the supply chain, with the objective to disincentivise the creation and distribution of fake goods.

Highlights:

- Targets the real problem of data sharing and lack of trust between supply chain stakeholders
- Brand owners (EUIPO) at the core through the Identity Registrar
- Protects commercial information while allowing inspection (selective disclosure)
- Focuses on logistic data supported by current standards (IATA, GS1, ...)
- Data exchange for a shipment notarized in any blockchain through single use seals
- Flexible technology choices for use case customization:
 - Product ID serialization
 - Track & Trace provider
 - NFT Platform (digital twin management)
- Open source and industry grade standard technology (pilot-ready)
- Low adoption barrier: API compatibility layer for Logistic nodes
- Potential to evolve along with standardization (i.e. ESSIF, EBSI)
- Potential to integrate with EUIPO tools (IPEP/IP Register in Blockchain)
- GDPR compliant (no personal on-chain data)

EBSI-ELSA blockchain infrastructure

For a real economy state of the art public open source blockchain infrastructure, check out by way of example:

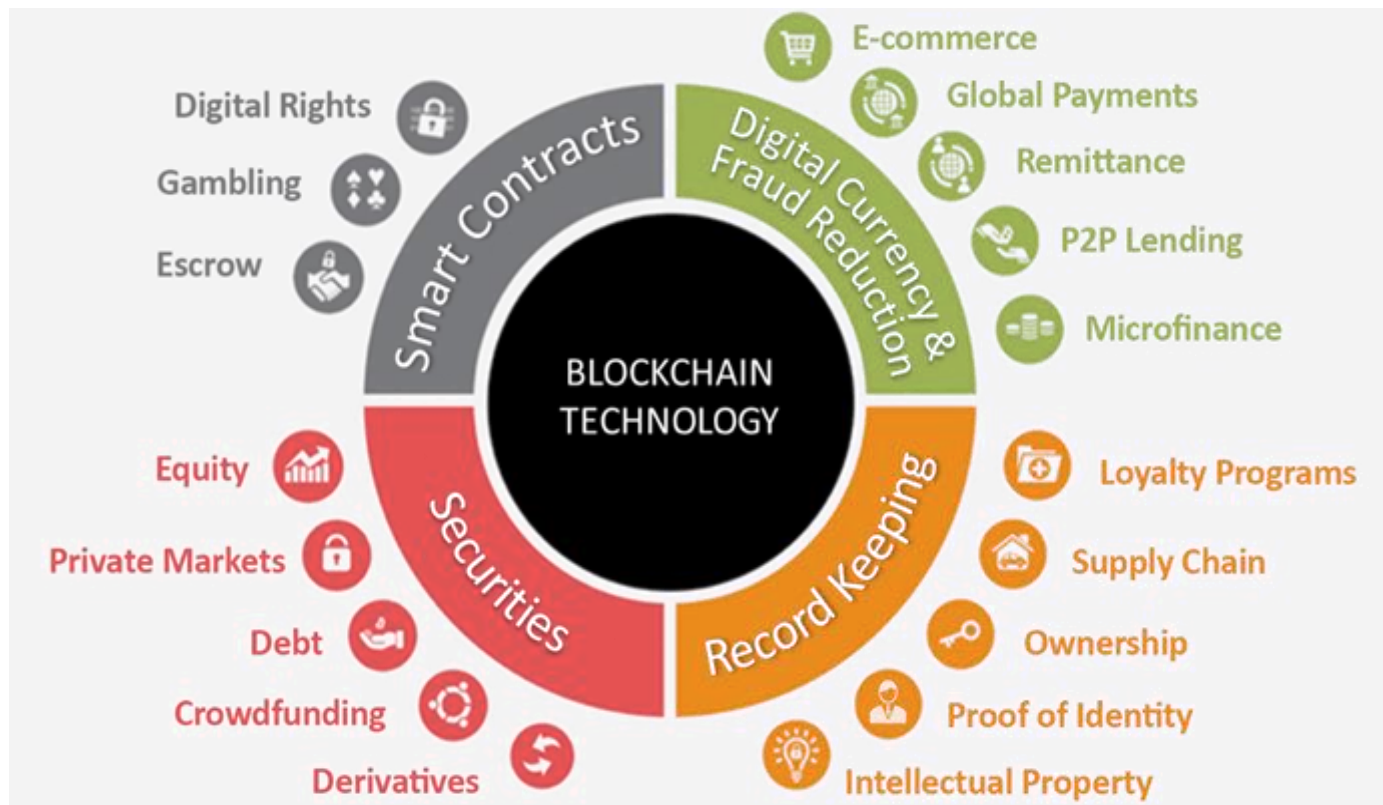
<https://ec.europa.eu/digital-building-blocks/sites/display/EBSI/EBSI-ELSA+EUIPO>

<https://www.youtube.com/watch?v=aQKnazbrl84>

Also check out on the broader approach towards verifiable credentials (= the EU's "Web3 trust model"):

<https://ec.europa.eu/digital-building-blocks/sites/display/EBSI/EBSI+Verifiable+Credentials>

Blockchain: Applications



Blockchain Is an EU Innovation Priority

2016 EPSC report on

EU innovation priorities

(<http://www.oecd.org/education/ceri/GEIS2016-MadelinReport-Full.pdf>):

"European Innovation Mission"

➔ *"We will make together ... bold bets on change in tricky areas: education, health, universities, tax; and some bolder bets on potential breakthrough technologies, notably genomics, the brain, **distributed ledgers** and quantum."*

Cf. section on **"Blockchain and its application in fintech and beyond"**



Policy Reflections: Some Thoughts

Issues of relevance:

- Laissez-faire (within limits)? → competition, skill development, sandboxes
- Global technologies mainly for national/regional/local use?
- Regulatory competition on top of market-based innovation or centralised harmonisation?
- Humans and Machines: How Much Human Control ...?
- ... and By Whom??? → social/societal context

EU view:

Every long-term assessment – including jobs lost and gained – speaks in favour of massive policy support for blockchain ...
... but essential: governance of transition from old to new

Some Economic Reflections on FinTech/Crypto Innovation

Intersection between finance and technology

- Innovation in traditional finance
ATMs, automated trading, online banking, “traditional” crowdfunding, robo advisors...
- Digital services that disrupt existing markets and create new ones
Cryptocurrencies, distributed ledger technology (DLT)-based applications, smart contracts, “smart” crowdfunding, token sales...

Characteristics

- Disintermediation (not disappearance of intermediaries);
- Network effects and path dependency;
- Reduction of transaction costs (time and money)

Centralisation vs. Decentralisation

Preliminary remark: There is confusion between “decentralised” and “distributed” systems. In IT terms, what we mean is distributed systems. However, in all other contexts we speak of decentralisation (as no one would understand it if we speak of distribution).

Centralisation is clearly defined. Decentralisation is not. Proxies help to give it meaning (e.g. “no one owns more than 20 percent”).

Nothing is fully decentralised, not even Bitcoin or the universe.

In the Crypto Space: Centralised Risk Triggered Decentralisation

15 September 2008: Winter

The bankruptcy of Lehman Brothers forms the climax of the subprime mortgage crisis in the US and triggers a chain reaction across financial markets worldwide.



(Picture source: euractiv.com)

31 October 2008: Spring

Satoshi Nakamoto publishes a paper entitled "Bitcoin: A Peer-to-Peer Electronic Cash System" (<https://bitcoin.org/bitcoin.pdf>). Shortly thereafter, he mines the genesis block of the first cryptocurrency.



(Picture source: bitcoin.org)

Systemic Risk in Centralised Structures Necessitates Decentralisation

- The 2007/08 financial crisis exposed huge systemic risks inherent in legacy capital and financial markets.
 - The key risk factor consisted of interlinkages in centralised systems of interdependent financial intermediaries without adequate risk control mechanisms.
 - ➔ The crisis heavily impacted enterprises (especially SMEs).
 - ➔ It also brought whole economies to the brink of collapse.
 - For years to come, regulators had to operate in a defensive mode to stabilise dysfunctional centralised structures.
 - There is a clear role for decentralised forms of finance as a lever for risk mitigation and market democratisation.
- ➔ **Digital Finance/FinTech, Tokenisation**

Centralisation vs. Decentralisation

Centralised financial structures have been (and still are) a recurrent source of systemic risks with negative spillovers to the real economy.

But what about crypto crime!?

Decentralised financial structures have no such track record.

**They are a solution,
not the problem.**

(and Terra Luna or FTX do not affect this statement.)

2022 Chainalysis Crypto Crime Report:
„Transactions involving illicit addresses represented just 0.15 % of cryptocurrency transactions in 2021 ... the yearly trends suggest that ... crime is becoming a smaller and smaller part of the cryptocurrency ecosystem.“

Decnetralisation Requires Crowd Management

The “**crowd**” encompasses all persons an organisation interacts with directly, i.e. without intermediaries. Since more than a decade we are witnessing the emergence of ever more **crowd-x activities**, such as

- **Crowdsourcing;**
- **Crowdinnovation;** and
- **Crowdfunding.**

These are decentralised, bottom-up processes that can be usefully developed and steered by the organisation, both by social and profit-making organisations.

Crowd Management – as data management and cybersecurity – are daily tasks for the whole organisation, excluding no one.

Internet vs. Metaverse

Internet (Web 2.0):

- 2D websites
- Distance between user and content
- Online on demand
- PC, Laptop, Smartphone
- Input via keyboard/mouse
- Data storage and processor: the device itself
- 3G/4G

Web3 (Metaverses):

- 3D spaces
- Immersive / mixed reality
- Online 24/7
- XR-devices, haptic technology
- Input via voice, gestures, body functions
- Data storage and processor: edge computing, cloud
- 5G/FTTx

Emergence of a New Approach for Policy Making and Regulation

Legacy System: Top-down

- Mature markets
- Limited number of incumbents
- Few new competitors
- Incremental innovation (for more efficiency)
- Regulation in long cycles
- Regional ringfencing possible

➔ ***solid, durable structure***

Examples:
banking,
securities



Token Economy: Bottom-up

- Emerging markets
- No established incumbents
- Many new competitors
- Disruptive innovation (for the market)
- Innovation outpaces regulation
- Global yet decentralised

➔ ***open, fluid approach***

Examples:
crowdfunding,
crypto assets,
tokens



Example: MiCA Regulation with 3 Pillars

| I. Exemptions (Articles 2 and 4 + recitals) | II. Crypto Assets (except Stablecoins + E-Money Tokens) | III. Stablecoins + E-Money Tokens |
|---|--|---|
| <p><u>No</u> regulation <i>or</i> <i>decision postponed</i></p> <p>Examples:</p> <ul style="list-style-type: none">- Small amounts;- crypto mining;- NFTs;- DAOs;- DeFi | <p><u>Relatively light</u> regulation</p> <p>White Paper sent to regulator ➔ EU passport (<i>burden of proof on regulator</i>)</p> <p>= „utility tokens“</p> | <p><u>Comprehensive</u> regulation (but no prohibitions)</p> <p>Why? Potential problems originate from outside crypto domain (e.g. monetary policy, competition policy)</p> |

Example: Programmable Money

Search for viable private alternatives to ensure programmable money supply and digital functionalities for the token economy

Example:

Tokenise Europe 2025

A pan-European industry, finance and public sector initiative with active participation from Liechtenstein



INITIATED BY

bankenverband

MODERATED BY

Digital Skills

Which competences do “***digital skills***” refer to?

1. Information and Data Literacy
2. Communication and Collaboration
3. Digital Content Creation
4. Safety
5. Problem Solving (by using digital tools)

(cf. 2016 Digital Competences Framework 2.0:

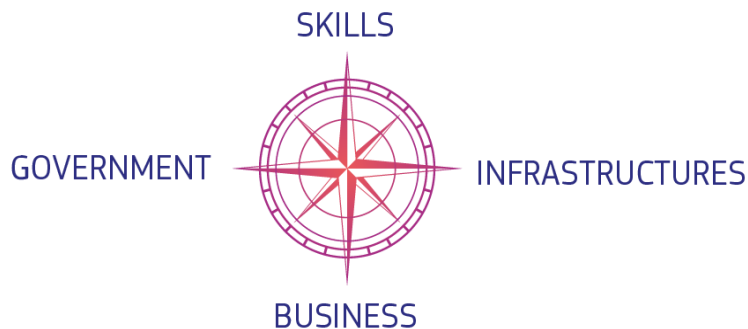
<https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework>)

Digital Skills Needs for All Enterprises

1. Self-Assessment: How Digital Is My Organisation?
2. Essential Digital Skills
 1. Data
 2. Cybersecurity
 3. Crowd Management
3. Specific Digital Skills
 1. Distributed Ledger Technology/Blockchain
 2. Digital Finance: From Crowdfunding to the Token Economy
 3. Artificial Intelligence
 4. Platform Economy

(Cf. <https://x.facebook.com/EU.Growth/videos/digital-skills-european-approach-and-practical-tools-by-dr-joachim-schwerin/361581135624235/>)

Digital Compass: KPIs until 2030



Skills

- 20 mio ICT specialists
- gender convergence
- basic digital skills > 80 % of population

Government

- Key public services 100 % online
- 80 % of citizens using digital ID

Infrastructures

- Connectivity/semiconductors/
cloud/quantum computing

Business

- Grow scale-ups & double EU unicorns
- Focus on late adopters (> 90 % of SMEs)



CHAISE



International Association for
Trusted Blockchain Applications

CHAISE is a 4-year transnational initiative funded by the European Commission under Erasmus+ (Sector Skill Alliance call for proposals) to set forward a sectoral approach to blockchain skills development.

CHAISE will formulate and deliver a European strategy to address skill mismatches and shortages in the blockchain space and deliver future focused training, qualifications and mobility solutions, geared towards sectoral realities and needs. (Cf. <https://chaise-blockchainskills.eu/>)



Information on DLT/Blockchain (Examples)

EU Blockchain Strategy: <https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy>.

EU Blockchain Observatory and Forum:
<https://www.eublockchainforum.eu/>.

European Blockchain Association:
<https://europeanblockchainassociation.org/>.

INATBA: <https://inatba.org/>.

What Will the Future Hold? 2035

(Example: Wharton Blockchain and Digital Asset Project)

| The traditional and digital assets worlds will be ... | distinct | integrated |
|---|---|--|
| centralised | Two parallel systems develop based on distinct tokens; AI (or sheer antagonism) place people in either system; confrontation. | Society is cashless; permissioned blockchains are used by central authorities; decentralisation is a fading ambition from the past; Web 2 dominates top down. |
| decentralised | The decentralised crypto world coexists with the legacy system; bridges between systems become powerful gateways/-keepers; multiple metaverse(s). | Steady decline of nation states amidst the proliferation of self-selected DAO governed communities; sovereign judicial systems enhanced by VR, the metaverse and zero knowledge proof privacy. |

Many thanks for your attention!



More information:

https://ec.europa.eu/growth/index_en