Blockchain: Opportunities for Public Administration and e-Governance

Towards a Brave new Future

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Member of the Board @Hellenic Blockchain Hub

Table of Contents

Mellon Group of Companies

Established in 1994, Mellon is a leading multinational group with offices in Central and SE Europe, Cyprus, Turkey and Algeria. For over two decades, we have been leading the way in technology and outsourcing.

Hellenic Blockchain Hub

Hellenic Blockchain Hub, is a **non-profit organization aimed at the dissemination of knowledge about the blockchain technology in our country**.

Blockchain: Opportunities for Public Administration and e-Governance

A digital decentralized - distributed ledger, public or private, on which transactions or data are interconnected in data blocks making them virtually immutable and undisputable from all distributed nodes that have shared the data

Case Studies – Real Life Cases and POCs

Real life blockchain implementations across industries in Enterprise level

MELLON UNIQUE PROPOSITION

AT A GLANCE

- FACILITATE THE DEVELOPMENT OF ELECTRONIC TRANSACTION CHANNELS
- INCREASE OPERATIONAL FLEXIBILITY & EFFICIENCY
- INTRODUCE COMPETITIVE PRODUCTS WITH FAST TIME-TO-MARKET
- SECURE MODERN BUSINESSES FROM PHYSICAL AND CYBER RISK & FRAUD

Employees

5.500+

Countries

12

Turnover

115+

E

Established in 1994

A pioneer in payments industry

I

ISO 9001 & 27001

Certified operations & procedures

P

PCI-DSS

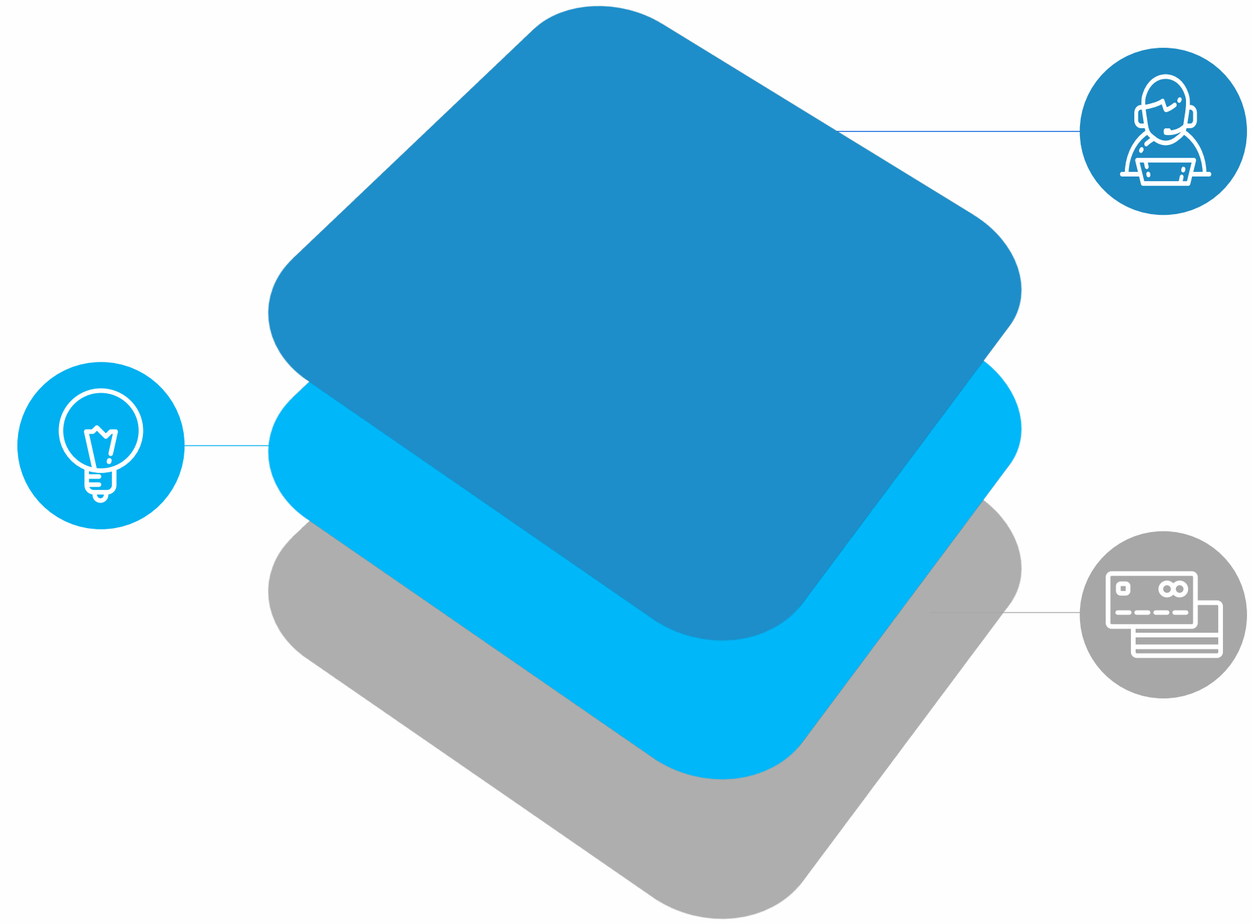
Highest standards in security

MELLON GROUP OF COMPANIES

25 YEARS SINCE 1994

360 OFFERING

YOUR DIGITAL TRANSFORMATION PARTNER



Business Process Outsourcing Services

Contact Centre Services

Technology Solutions

STRATEGIC PARTNERS

INTERNATIONAL TECHNOLOGY VENDORS

ingenico GROUP

gemalto security to be free

NEC

THALES e-Security

unblu

altitude software

GENESYS

fiserv.

LG

EURONOVATE

STRANDS

MATICA TECHNOLOGIES

FireKing

SARGENT AND GREENLEAF

NEOPOST

CIMA WHEREVER YOU COUNT

MELLON GROUP OF COMPANIES 25 YEARS

INTERNATIONAL REFERENCES

INDICATIVE CLIENTELE ACROSS COUNTRIES

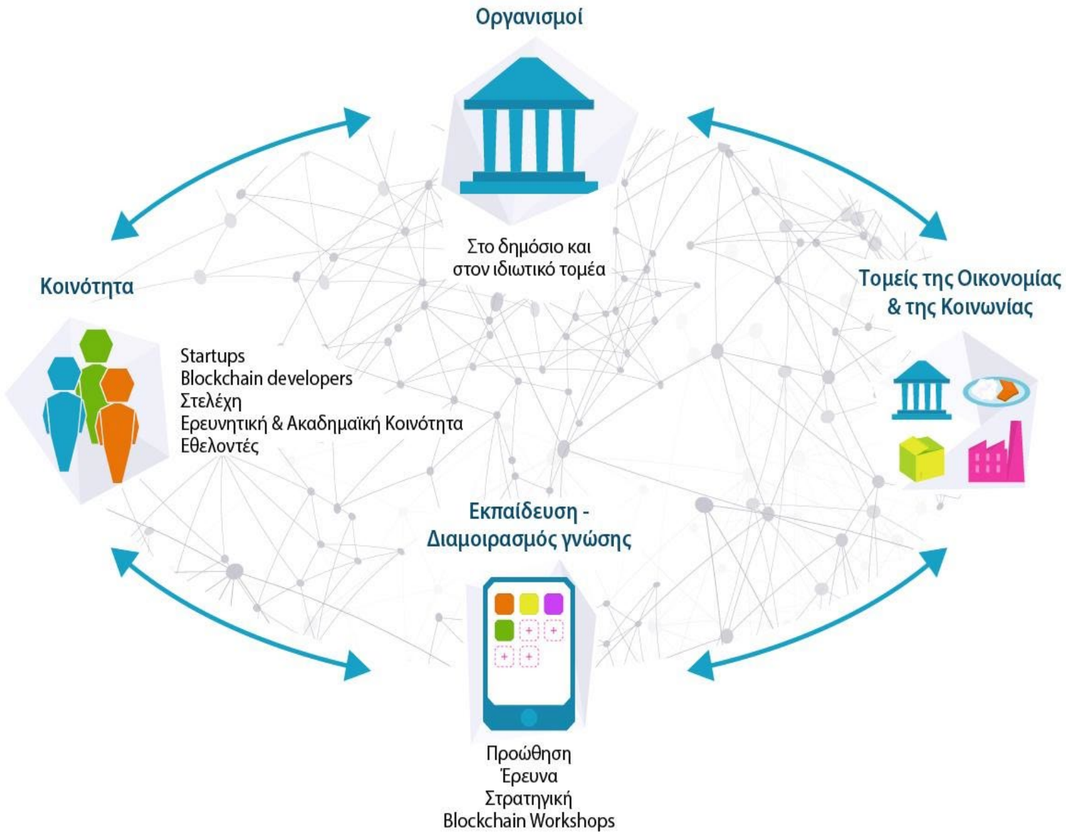
NATIONAL BANK OF GREECE
PIRAEUS BANK
Eurobank
ALPHA BANK
UniCredit Group
mBank
Raiffeisen
HALKBANK
CRÉDIT AGRICOLE
SOCIETE GENERALE
ING
ProCredit Bank
KBC
ПУМБ
Bank of Cyprus
INTESA SANPAOLO
CaSys International
ERSTE
Euronet WORLDWIDE
First Data.
cardlink
forthnet
vodafone
cyta
telenor
COSMOTE
TVR
TELEKOM AUSTRIA GROUP
VIVACOM
ORION TELECOM
vip
ALBtelecom
AIG
DACIA
The Mart
L'ORÉAL
ZUS
AVON
adidas
ATHENS
TOYOTA

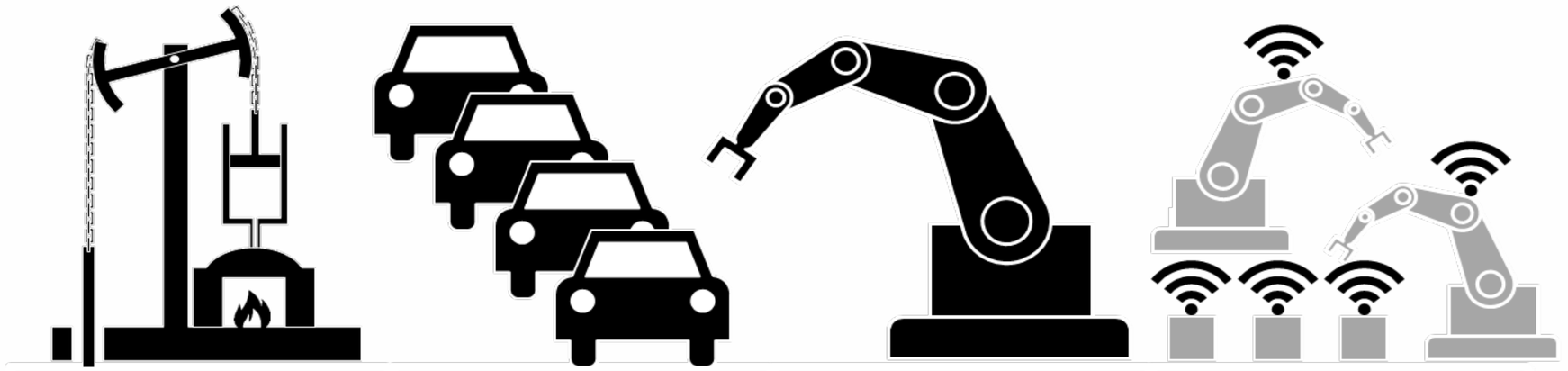
MELLON GROUP OF COMPANIES 25 YEARS SINCE 1994

H.B.H. Hellenic Blockchain Hub

Make Greece a Blockchain Nation

Create new job offerings leveraging on Digital Asset, helping Organizations, Governments and Institutions **increase** their **profitability** and **efficiency** in a decentralized and competitive environment. In Private and Public sector with **trust** and **transparency.**

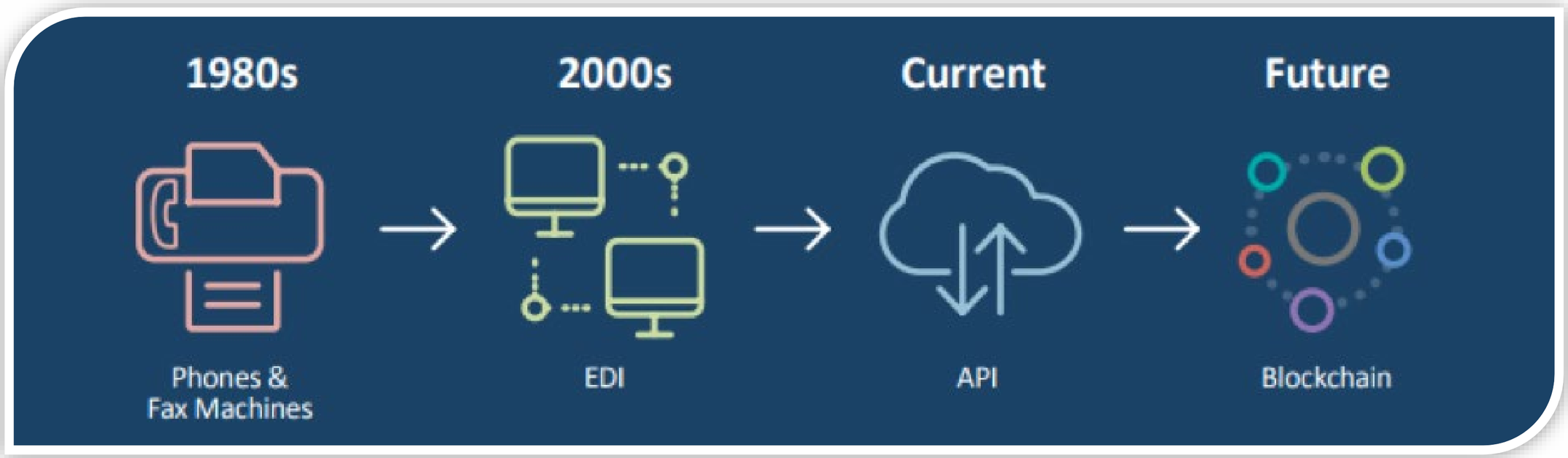




1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation PC, Internet	Cyber Physical Systems

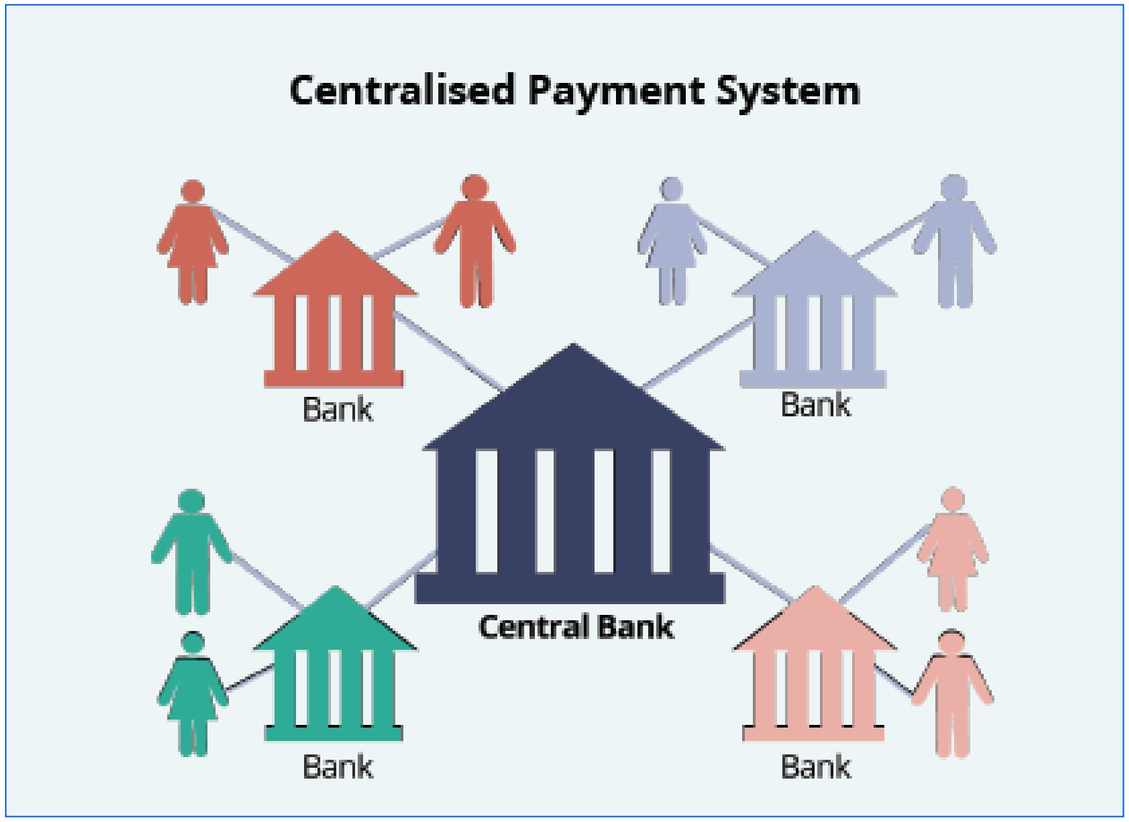
- ❖ Robotics,
- ❖ Artificial Intelligence,
- ❖ Nanotechnology,
- ❖ Quantum computing,
- ❖ Biotechnology
- ❖ The Internet of Things (IoT)
- ❖ **Decentralized Consensus**
- ❖ 3D printing
- ❖ autonomous vehicles

From internet ... to internet of value ...



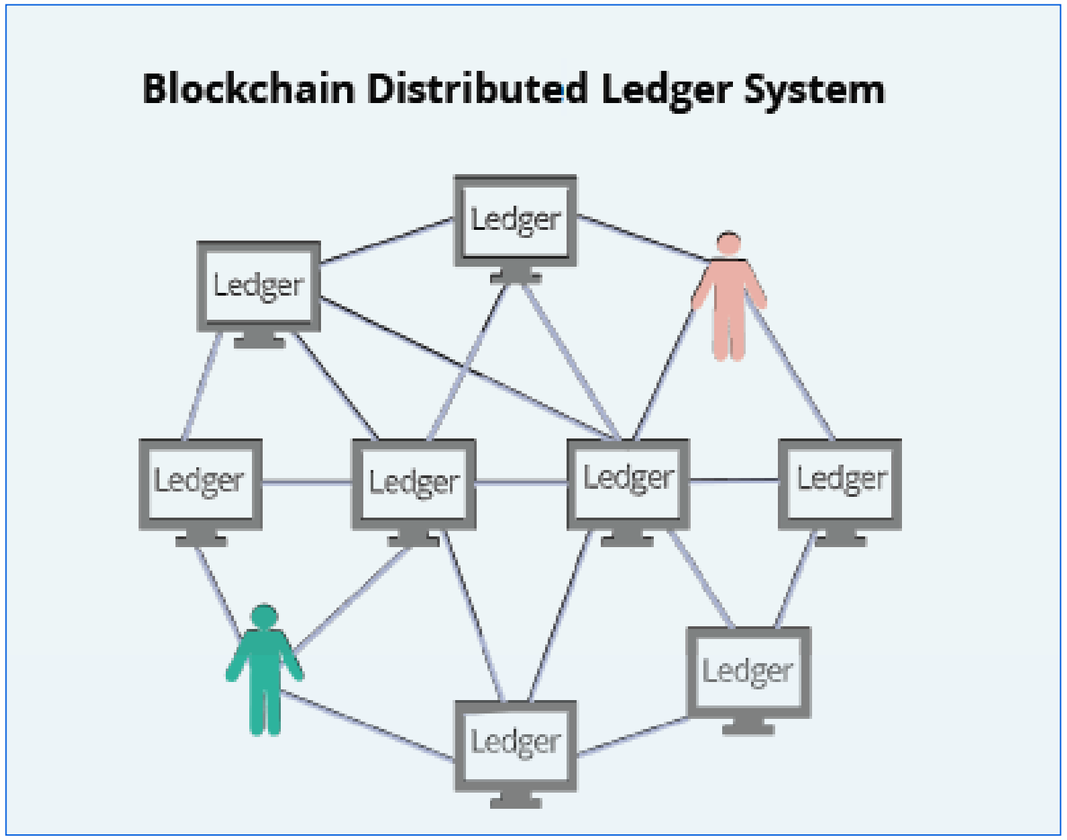
Financial crisis | trust | need for transparency & accountability

The Emergence of the Blockchain

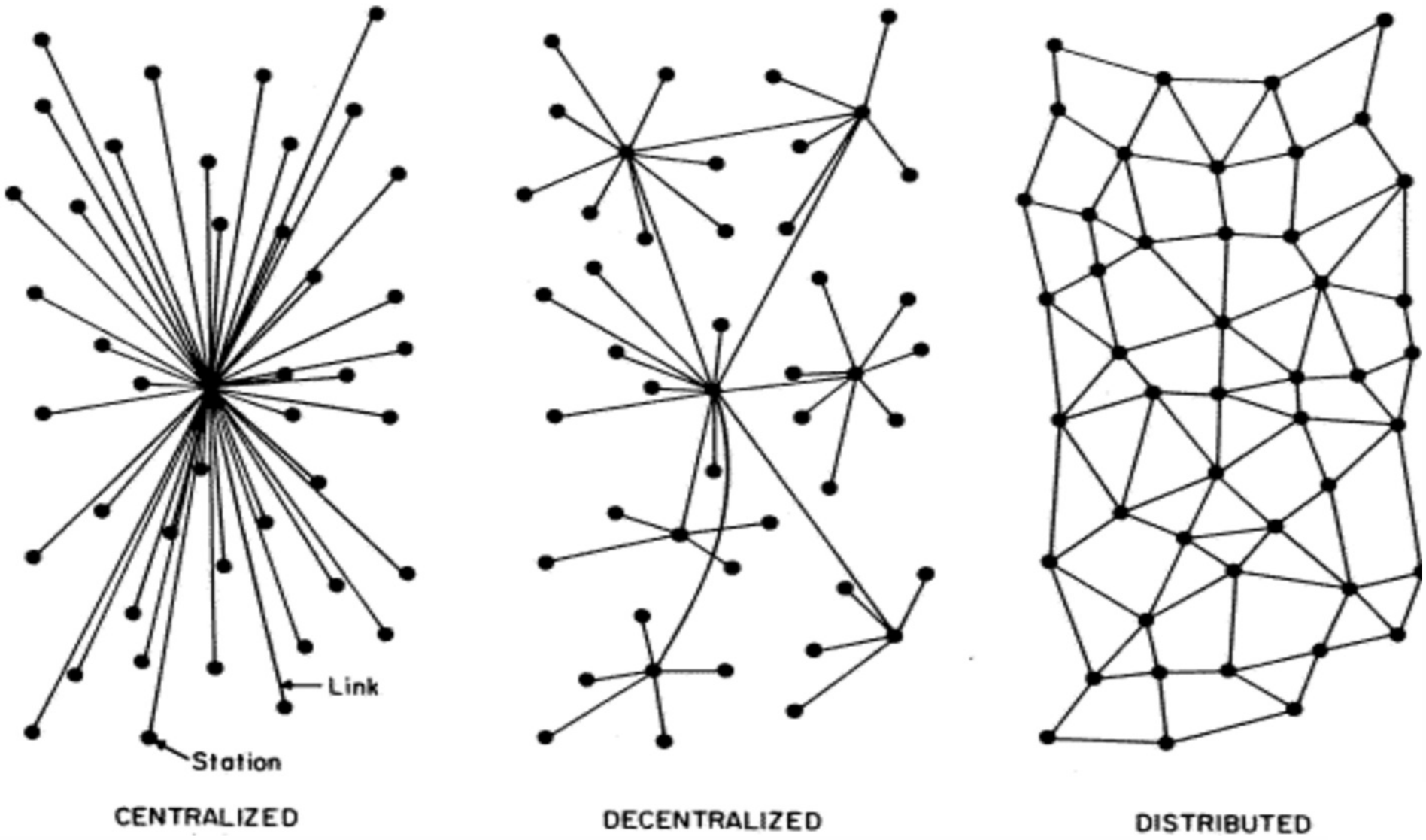


http://www.imf.org/external/pubs/ft/fandd/2016/06/adriano.htm

Centralized bank tracks payments between clients



Network nodes store transaction record settled by many individuals



P2P economy and market disruption

We live in a “**platform economy**”

The future is now…

Commuterz

Making Carpooling Fun Again

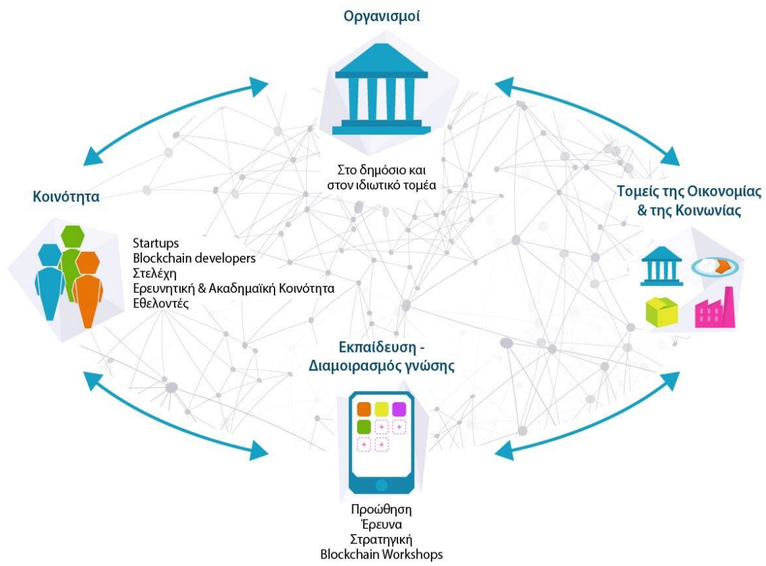
Hellenic Blockchain Hub

… a **non-profit organization aimed at the dissemination of knowledge about the blockchain technology in our country**

Objectives

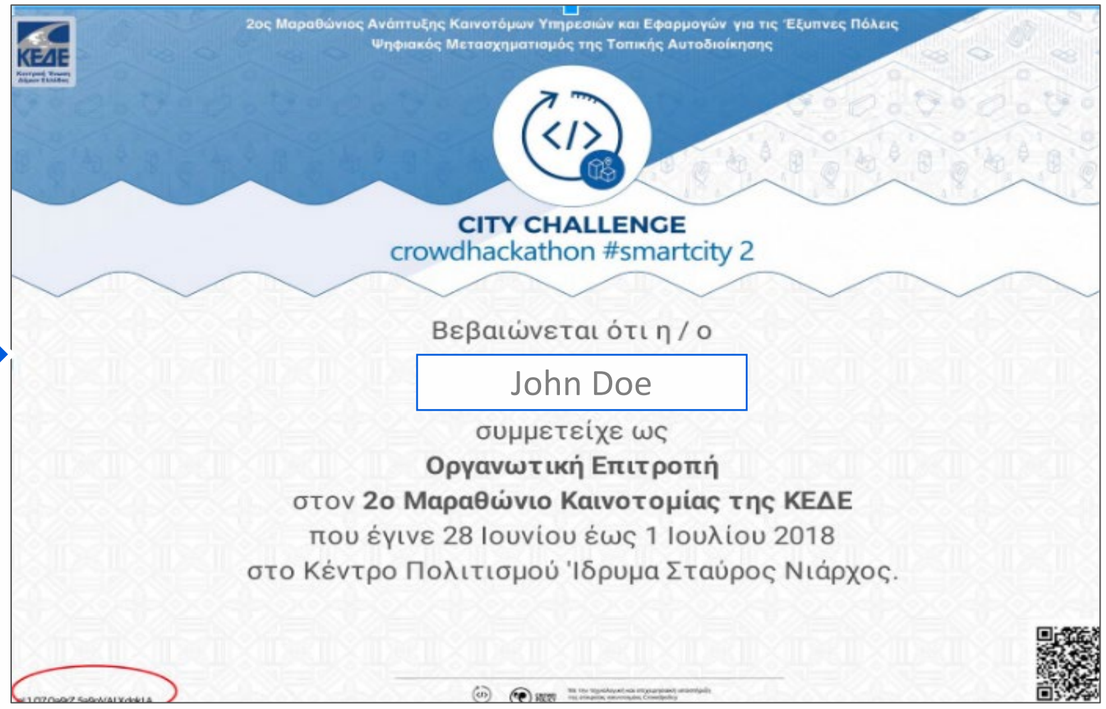
The main objective of the **Hellenic blockchain Hub** as an organization and network is to contribute to the promotion of blockchain.

- Promote Blockchain DLT technologies
- Develop a **business** and **social ecosystem** of innovation around blockchain
- Disseminate and raise awareness - inform citizens and stakeholders
- Create of a permanent mechanism for consultation with the Greek state and Europe
- Networking and synergies with collective bodies and policy makers
- Creation of Blockchain Academy for educational purposes



Actions Hellenic Blockchain Hub 2018

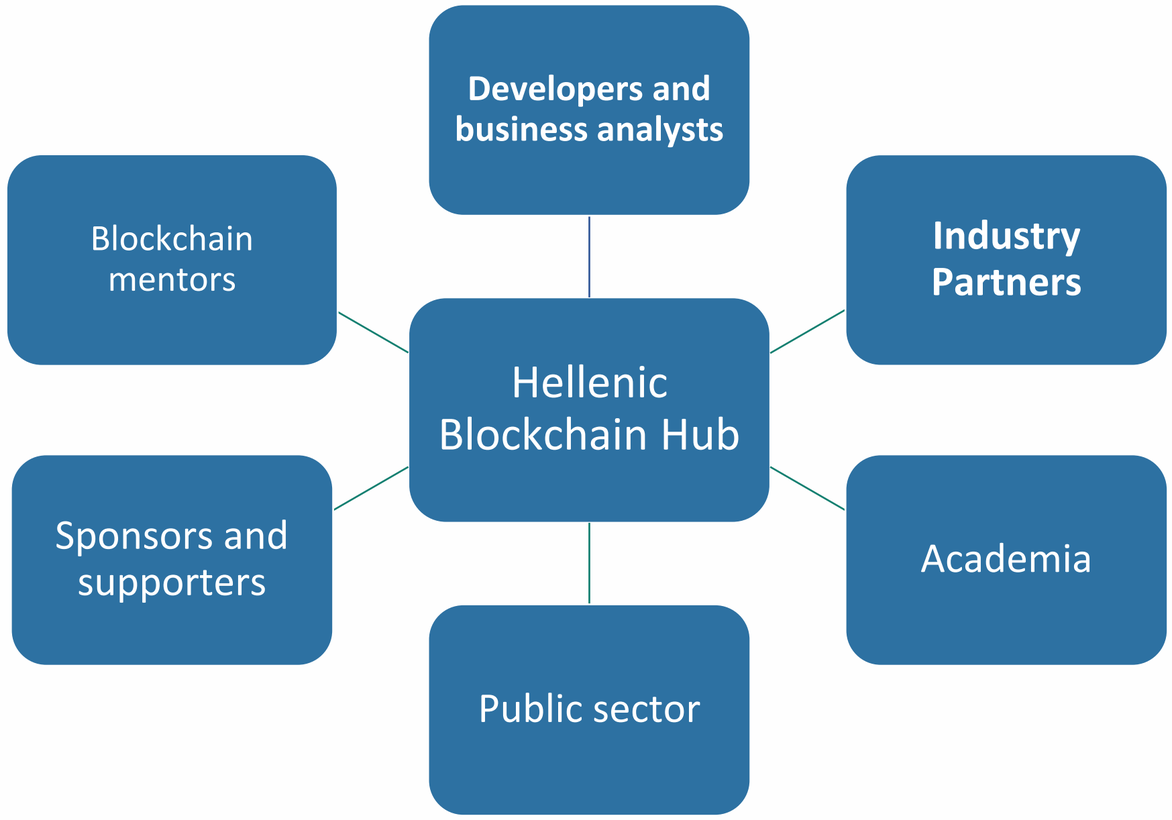
- Community building
- Workshops - Meetings - Conferences - C Level labs
- Collaboration with Bodies and Organizations to develop pilot applications in sectors and sectors of the economy (POCs - Proof of Concept)
- Supporting the Configuration of National Strategy on Blockchain
- Operating Support for Technological and Supporting Structures
- Supporting innovation actions e.g. hackathons Mentoring / Coaching for the development of innovative business models



HYPERLEDGER

Memorandum of Cooperation

- National center of Research and Development / Institute of Informatics “ΕΚΕΤΑ/ΙΠΤΗΛ” (3/4/2018)
- ΓΑΒ LAB/ University of Peloponnesus (4/4/2018)
- Digital Governance Research Centre (DGRC) (17/4/2018)
- Proposal Memorandum of Cooperation with IST College(19/4/2018)
- Proposal Memorandum of Cooperation Ministry of Digital (21/7/2018)
- T.E.I of Thessaly (30/7/2018)
- Intelligent Computing Systems Laboratory & Informatics University of Thessaly (28/1/2019)



Executive human network (indicative list)

Mellon Technologies
Athens International Airport
CERTH / ITI
National union of municipalities
Venture Capitals
Cosmote
OPAP
National Bank of Greece
Attica Bank
Piraeus Bank
Eurobank
Alpha Bank
IBG bank
Nokia
Ministries
Hellenic exchanges
The world bank
Mastercard
NN hellas

ΕΜΠ
FIFA
KPMG
R3 london
Universities
IBM

+22

Dev ecosystem

Proficiency in one of the following languages: Golang (preferred) or C++ or Java or JavaScript
Strong knowledge of common algorithms and data structures
Familiarity with basic cryptography
Familiarity with P2P networks
Experience in Ethereum Ecosystem
Experience in Solidity
Experience in WEB3
Knowledge of ECR 20
Knowledge of bitcoin-like blockchains,

+78

Developers

Ethereum, ***Hyperledger***, *Multichain, HydraChain,*

Open Chain ***IBM Bluemix Blockchain***, *Chain IOTA*

JANUARY - FEBRUARY 2018

- Actions to establish a non-profit association under the name "HELLENIC BLOCKCHAIN" or "HELLENIC BLOCKCHAIN HUB“
- Creating a website & presence on social media (Facebook, Medium, etc.)
- Start accepting members of H.B.H.

MARCH 2018

7/3/2018: Meeting of the founding and active members of H.B.H. in the Be-finnovative premises of the National Bank

22/3/2018: Presentation of H.B. at the 5th Digital Banking Forum 2018

APRIL 2018

23/4/2018: Election of the Board of Directors & Audit Committee H.B.H.

28/4/2018: Participation & support of H.B.H. in Mindspace's 1st Meetup "Fintech & Blockchain" in Patras

MAY 2018

4/5/2018: In cooperation with the Open Greece Foundation (OK Greece), a workshop on "Open Data & Blockchain - An opportunity to Re-imagine your business?" At the Aristotle University of Thessaloniki

21/5/2018: Members of H.B.H. Participate in the EU Blockchain Observatory & Forum

JUNE – JULY 2018

21/7/2018: H.B.H. At the "Cloud Event" IBM Workshop at the Goulandris Museum

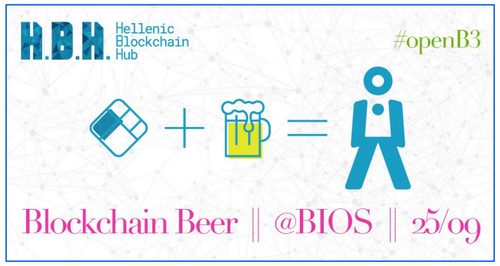
28-29-30 / 6/2018 & 1/7/2018: Participation & mentoring of H.B.H. members in Crowdhackathon #Smartcity 2 of KEDE in the ISN

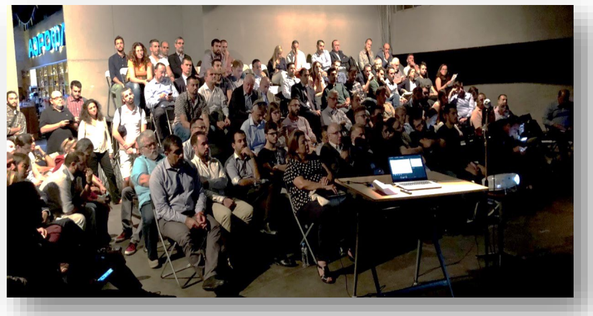
30/6/2018: Blockchain4Kids - Blockchain Workshop for Young Children - Pilot circulation of the 1st digital coin in Greece

21/7/2018: Signing a Memorandum of Understanding with Cyprus Blockchain Technologies

SEPTEMBER 2018

25/9/2018: Open B3 + Blockchain Beer Workshop on BIOS



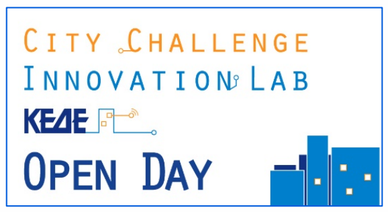


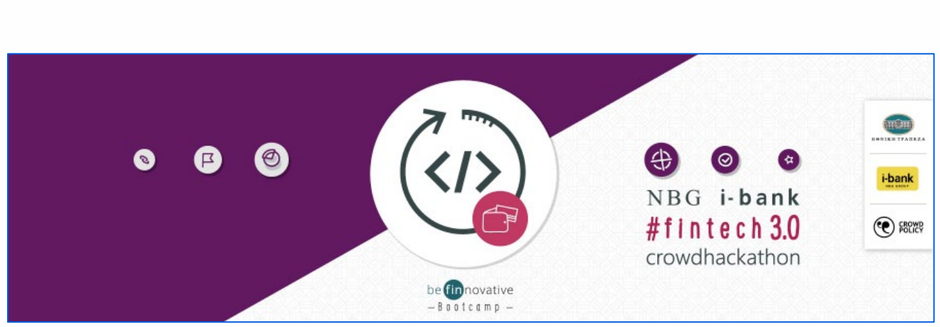
NOVEMBER 2018

5/11/2018: Participation & support of H.B.H. members At the KEDE Innovation Lab in ROMANTSO

14-16 / 11/2018: Participation with booths & lectures by H.B.H. at the "Decentralized 2018" conference of the **University of Nicosia**

30 / 11-2 / 12/2018: Participation & mentoring in Fintech 3.0 - Hackathon of National Bank



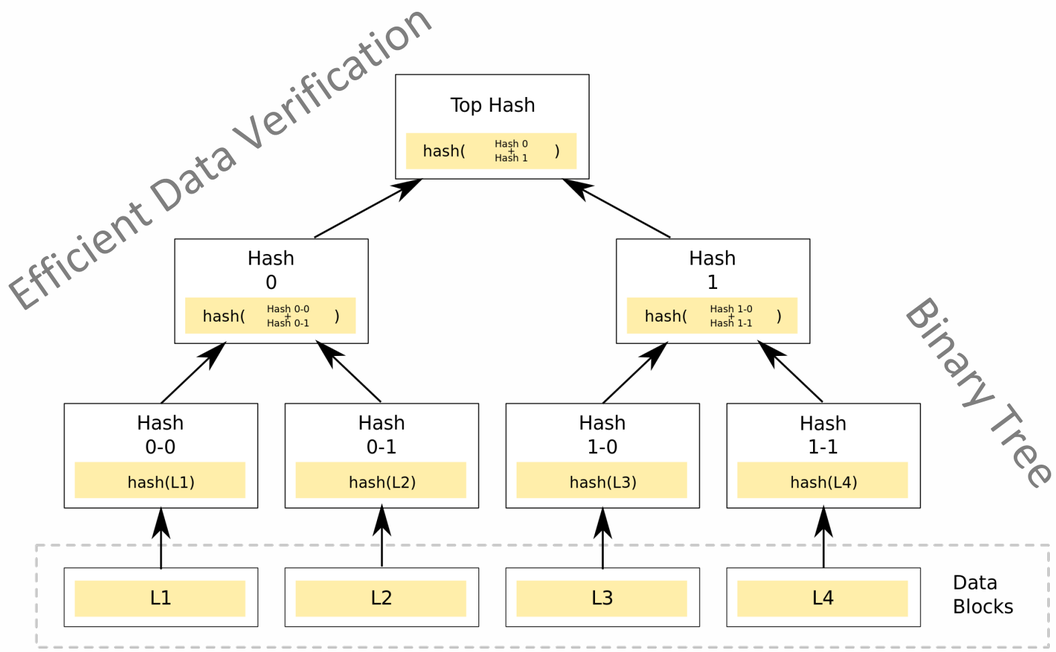


DECEMBER 2018

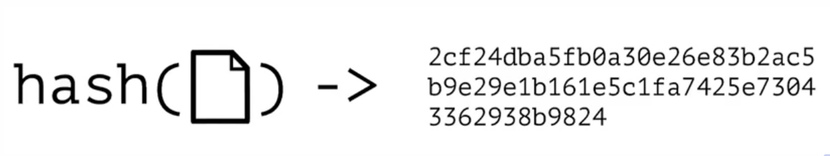
3/12/2018: Laboratory for the use of Blockchain & DLT Technologies at

SEV-Hellenic Federation of Enterprises offices

History of Blockchain



Merkle Trees



One Way encryption to 32 bytes
Similar data cannot have the same hash output
+ salt

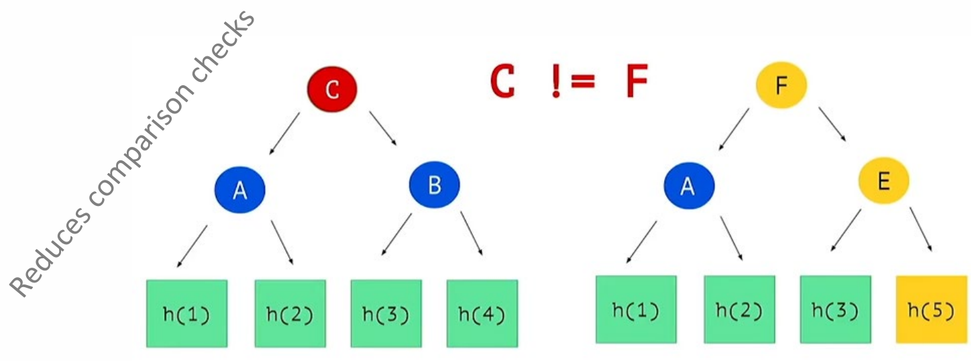
1991

Tamper-proof doc system Habert & Stornetta

2008

Satoshi Nakamoto Bitcoin

Proof of Work (POW)



Blockchain Adoption

2015

Exploration & Investment

- Initial capability & use case assessments
- Early adoption likely for internal reconciliation

2016–2017

Early Adoption

- Leading-edge banks see the value of blockchain and begin deployments for asset classes that are bilaterally traded and/or have no central clearing authority
- Regulatory certainty drives adoption for external uses
- Regulatory authorities realize the benefits of blockchain for auditing and compliance, and rule-making begins

2018–2024

Growth

- Banks begin to see the benefits accorded to early adopters and – combined with regulatory guidance and certainty – the network effect takes hold
- New service providers and models emerge
- Deployments go viral across numerous asset classes
- New products and services are created; incumbent processes and services are discarded

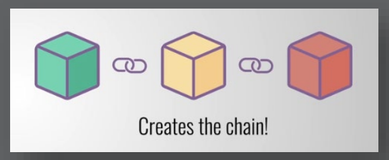
2025

Maturity

- Blockchain adoption is considered mainstream and integral to the capital markets ecosystem

Source: Accenture Research

Blockchain Simplified



Decentralized
No Centralized authority

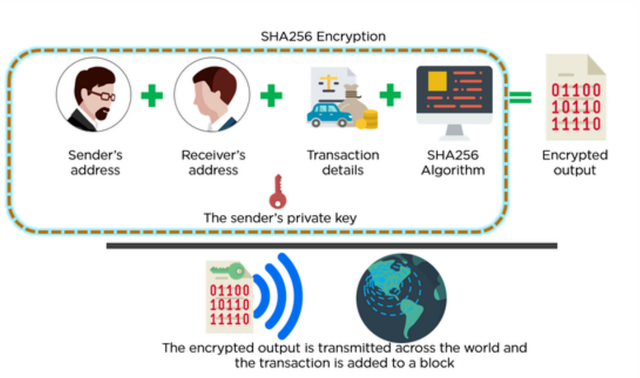
Immutable,
Tamper Proof

Encryption

Disintermediation

Smart Contracts
DAPPs – **Hyperledger**

Public or Private



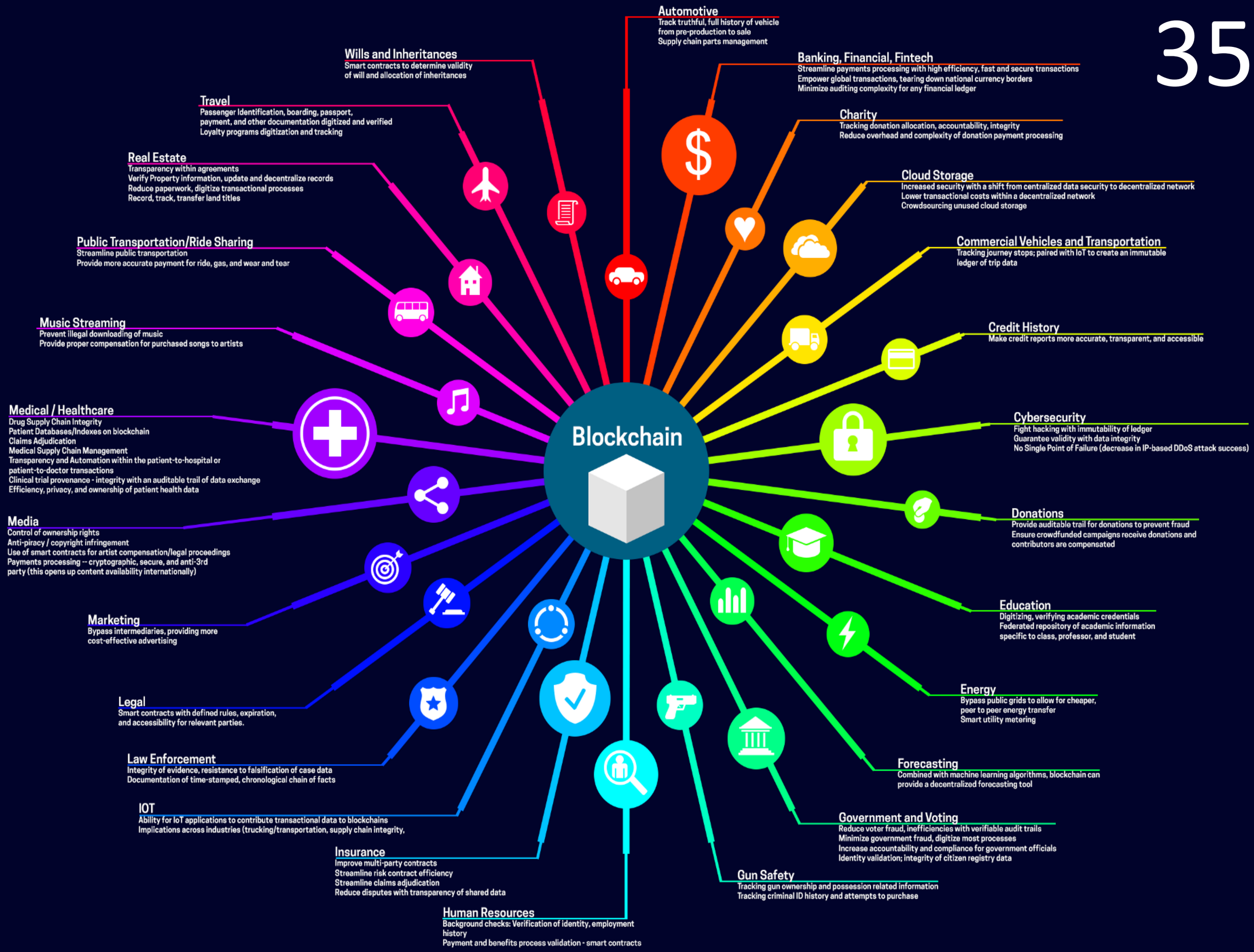
Cut Out
the Middleman

…a digital, distributed ledger, public or private, on which transactions or data are interconnected in data blocks. Using math and cryptography they become virtually immutable and undisputable from all distributed nodes that have shared the data…

Blockchain Everywhere Securing Digital Currency - Data - Securities providing Trust

A technology that disrupted the IT landscape in a manner that was not witnessed since the advent of the Internet.

BLOCKCHAIN APPLICATIONS



Opportunities for Public Administration and e-Governance

Public Administration & e-Governance

There are more than 200 initiatives on blockchain products in public administration and e-Governance, according to OECD analysis worldwide.

Blockchain experiments in the public sector are accelerating globally, with a concentration in the US and Europe.

Deloitte analysis in conjunction with Fletcher school at Tuft University

Transparent and Open Government Interoperability

Use Case	Description
Identity	Establishing and maintaining identities for citizens and residents (birth certificates, marriage licenses, visas, death records).
Personal records	Interoperable health records, insurance records, etc.
Land title registry	Details and historic records related to real estate and property transactions.
Supply chain management, inventorying	Tracking an asset from its creation, transportation, purchase, and inventorying.
Benefits, entitlements, and aid	Social security, medical benefits payments, domestic and international aid. Anticipatory/automated payments could be automated through Smart Contracts.
Contract and vendor management	Tracking and paying vendors, managing purchase commitments and transactions, and monitoring schedule performance. Can allow for perfect transparency of government expenditures.
Voting	Enabling new methods of digital voting, ensuring eligibility, accurate counting, and auditing (e.g., to avoid ballot-rigging).
Streamlining interagency processes	Blockchains and smart contracts can automate transaction handling and improve information sharing – allows each agency to better focus on their own mission and tech without as much need to consider others tech.

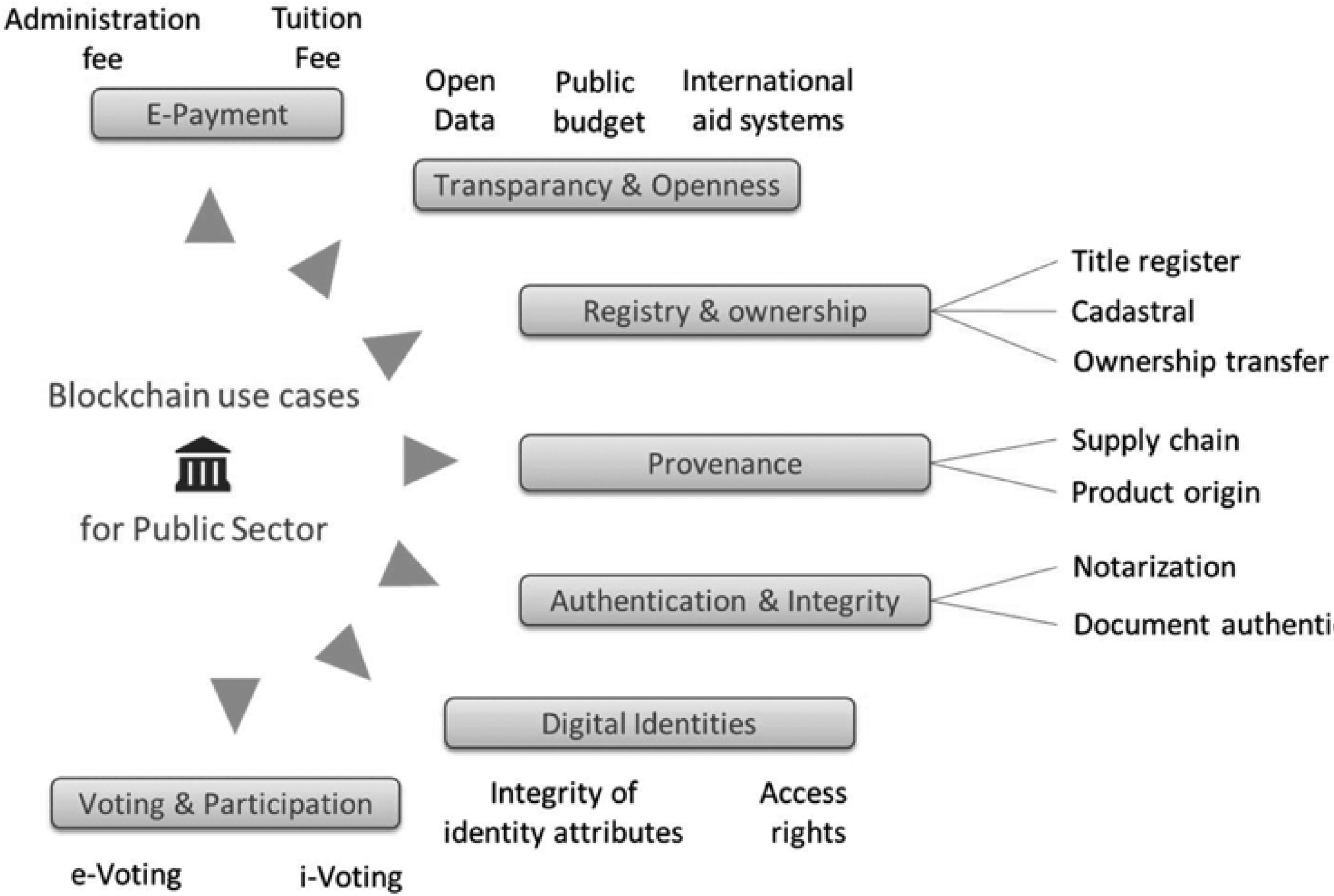
Top 10 types of projects

Rank	Types of projects (count)*
1	Strategy/Research (42)
2	Identity (Credentials/Licenses/Attestations) (25)
3	Personal Records (Health, Financial, etc.) (25)
4	Economic Development (24)
5	Financial Services/Market Infrastructure (20)
6	Land Title Registry (19)
7	Digital Currency (Central Bank Issued) (18)
8	Benefits/Entitlements (13)
9	Compliance/Reporting (12)
10	Research/Standards (12)

Source: OECD analysis of data collected by The Illinois Blockchain Initiative (March 2018)
*Initiatives may be tagged with more than one type of project.

OPSI

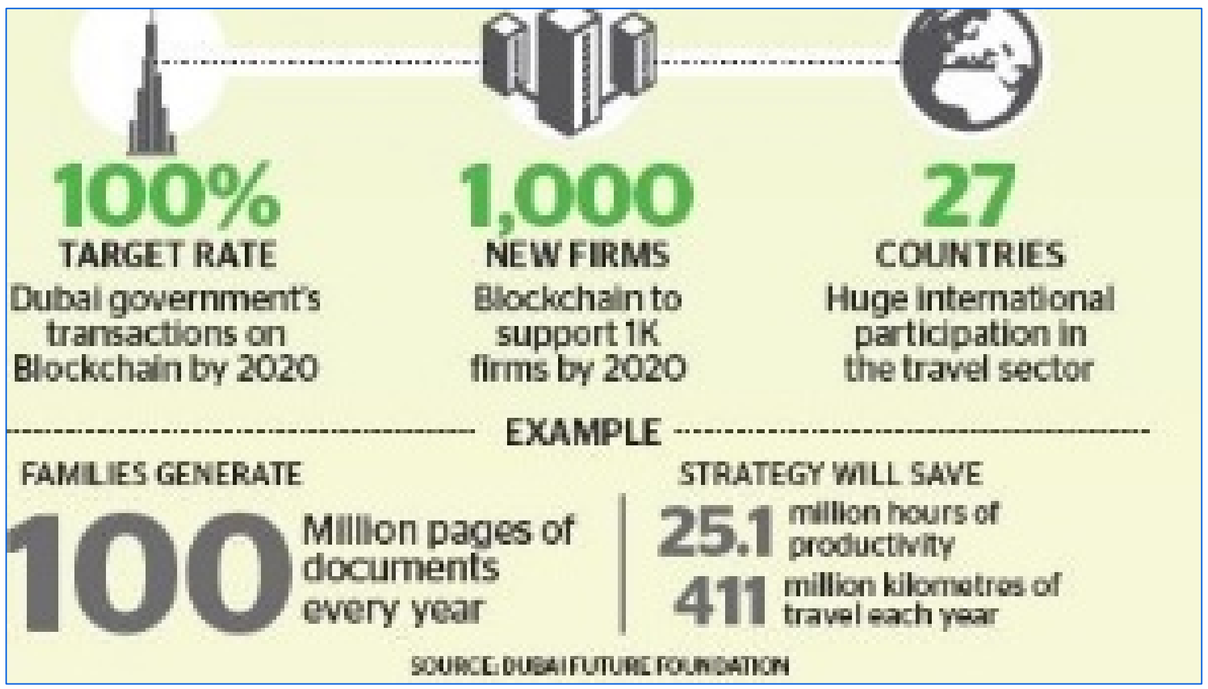
Blockchain MAP for the Public Sector



Blockchain in Dubai: Smart cities from concept to reality

Global Blockchain Counsel 2016

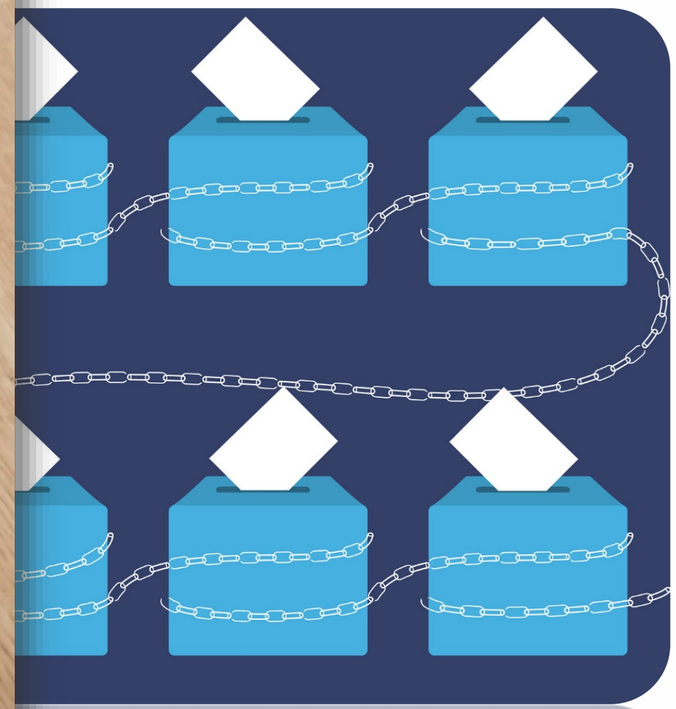
- Digitize health records on blockchain to provide patients and care providers with secure access to medical data.
- Digitize and transfer certificates on blockchain to secure the diamond trade.
- Tokenization Transfer titles of illiquid assets on blockchain to increase trade efficiency.
- Streamline ID verification to reduce business registration times.
- Use blockchain-based wills and contracts to ease transfer of ownership.
- Boost tourism in Dubai through a blockchain-based program that would allow visitors to better earn and spend **loyalty points**.
- Apply blockchain to trade finance to more effectively exchange goods and the financing for those goods.



FOOD FOR THOUGHT

Greek Elections 2019

- Budget for 2019 is about € 75 millions expected to be doubled
- 107,700 bundles of 500
  sheets
- Costs of envelopes € 8,
- 87,000 voting curtains
- 106,000 Ballot Boxes co



Voting on Blockchai

- Eliminate physical co
- Tokenized Anonymo
- No double voting
- Immutability
- Decentralized
- Speed of results, effi

tions

t

der Voting Estonia

ure Japan

- South Korea elections (National Election Commission and the Ministry of Science and ICT)

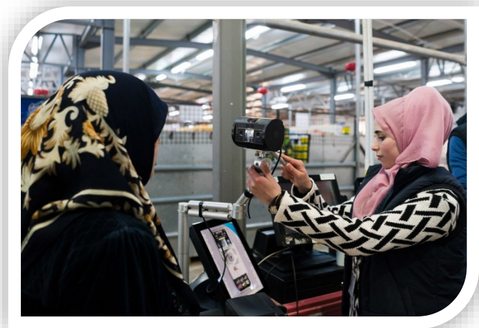
Source: in.gr

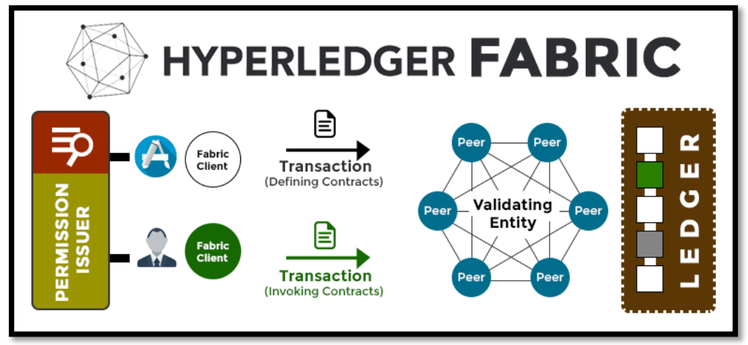
Blockchain Real World Examples

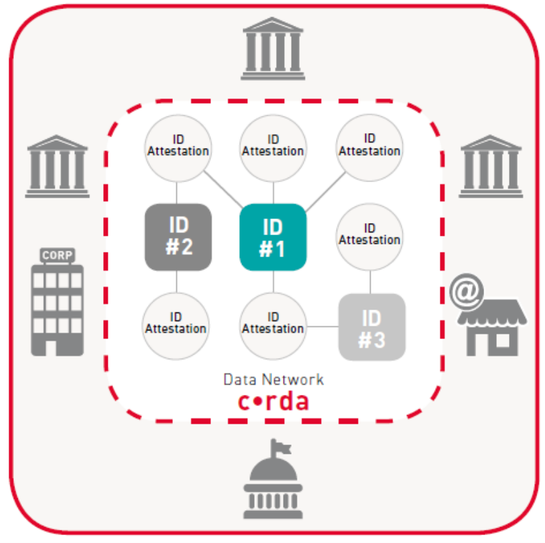
Land Titles
University Degrees
Supply Chain
Birth Certificates

Blockchain Real World Examples

Real life blockchain implementations across industries in Enterprise level





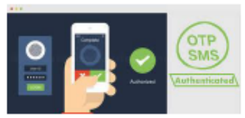


TAP ID
trusted adaptive portable id
Technology

Self-sovereign Identity / KYC
Digital Onboarding

ID creation

Self Proprietary Onboarding
Full Biometric



Level of KYC
Selection

ID tracking
open Blockchain

ethereum

Personal data storage

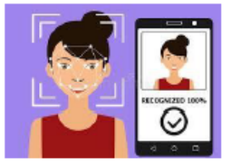
Creation of new ID
512 bit unique code

TAP ID
trusted adaptive portable id

ID link to wallet

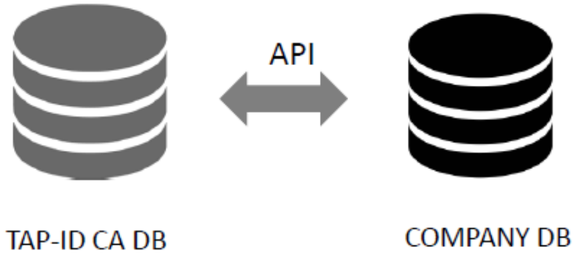
ID usage

Biometric Authentication



QRC/NFC
online matching

Back to back ID info transfer



GDPR and AML4 compliant

MELLON
GROUP OF COMPANIES

EURONOVATE

gemalto
a Thales company

KYC Mutualization

- Secure access to verified and up-to-date IDs
- Full data traceability for simpler auditability

Customer Identity Management

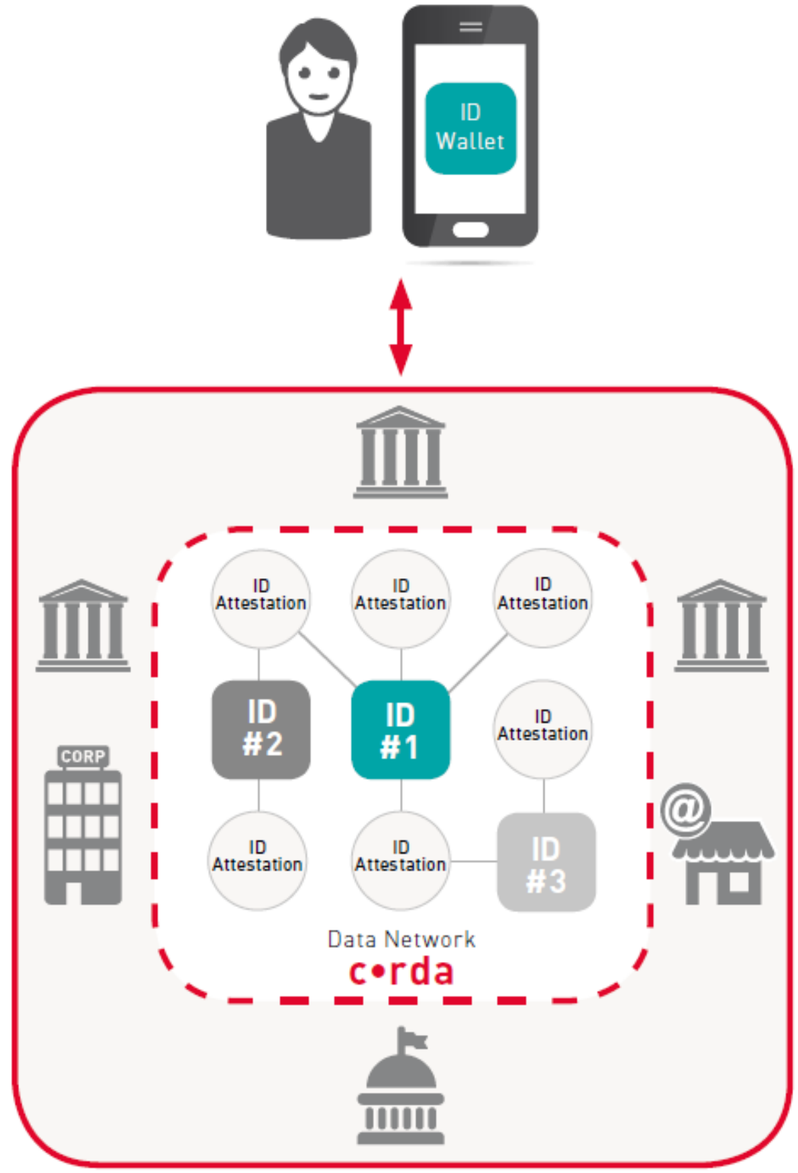
- Secure storage and management of ID attributes
- Seamless user consent management

Risk Management

- Extensive web of customer ID attributes
- Enhanced security for transactions like wire transfers

Benefits Banks

- Streamline the onboarding process of new customers and due diligence of existing ones
- Have access to up to date, accurate, and reliable data about their customers
- Provide a convenient and secure Identity Management service to their customers
- Limit risk of ID theft and fraud



R3

MELLON
GROUP OF COMPANIES

Jordan refugee camp that runs on blockchain.

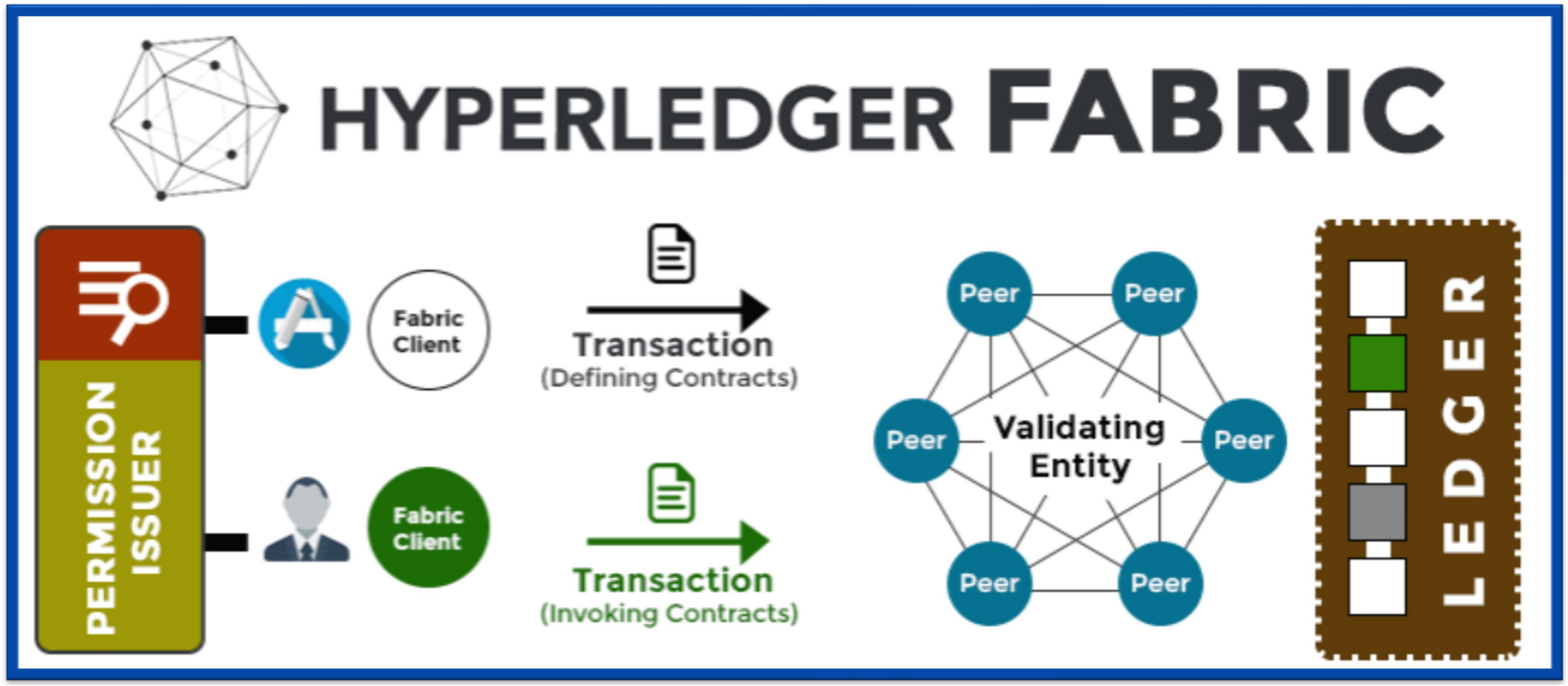
Blockchain helps solve unsolvable problems in authentication and privacy

Building Blocks
Source: MIT Technology Review

Though Bassam may not know it, his visit to the supermarket involves one of the first uses of blockchain for humanitarian aid.

By letting a machine scan his iris, he confirmed his identity on a traditional United Nations database, queried a family account kept on a variant of the Ethereum blockchain by the World Food Programme (WFP), and settled his bill without opening his wallet.

French Court Clerks to Use IBM Blockchain Platform for Corporate Registry



It will be used to record and share information related to:
- the exchanges of regulatory information related to companies' difficulties
- the changes of status of the company registered on the French territory (change of court office in which a company is registered; change of corporate names; the addition of a new branch office; or even dissolution of the business, etc…)

PARIS, March 14, 2019 /PRNewswire/ -- IBM (NYSE: IBM) and the National Council of Clerks (NCC)

https://newsroom.ibm.com/2019-03-14-French-National-Council-of-Clerks-of-Commercial-Courts-announce-the-deployment-of-a-blockchain-network-developed-by-IBM-to-streamline-the-management-of-commercial-and-corporate-registry

Four Recommendations for the Government

1. **Monitor Blockchain technology and identify regulatory needs**. Since national regulation has only a limited impact here, a European or better an international debate on the topic is necessary, as with other digitization questions. EU Blockchain Observatory

2. **Apply Blockchain technology and develop best practice examples**. Experience can only be gained by testing. The public administration should therefore analyze its own processes and consider how Blockchain technology might be implemented within them.

3. **Push standardization forward**. Currently, the development of Blockchain is characterized by proprietary interfaces. Standardization, which is urgently needed, has just begun.

4. **Actively shape the further development of Blockchain technology**. There are a number of open questions about the ethical and societal implications of Blockchain technology. Governments should allocate funding to research in this area.

EU 2019 Blockchain for Digital Government: *An assessment of pioneering implementations in public services*

Blockchain

KEY TAKE AWAY

…is evolving to be viable at scale. **Companies must narrow their options on the blockchain projects** taking into consideration their market dominance and the regulatory barriers to achieve security and revenue growth.

THANK YOU

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Group Digital Innovation Director @MellonGroup

Member of the Board @HellenicBlockchainHub

Backup Slides

	Public No centralized management	**Consortium** Multiple Organisations	**Private** Single Organisation
Participants	**Permissionless** - Anonymous - Could be malicious	**Permissioned** - Identified - Trusted	**Permissioned** - Identified - Trusted
Consensus Mechanisms	**Proof of Work, Proof of Stake, etc..** - Large energy consumption - No finality - 51% attack	**Voting or multi-party consensus algorithm** - Lighter - Faster - Low energy consumption - Enable finality	**Voting or multi-party consensus algorithm** - Lighter - Faster - Low energy consumption - Enable finality
Transaction Approval Freq.	**Long** Bitcoin: 10 min or more	**Short** 100x msec	**Short** 100x msec
USP	**Disruptive** Disruptive in the sense of disintermediation. No middle men needed. Unclear what the business models will be	**Cost Cutting** Can radically reduce transactions costs. Similar to SAP in the 1990s. Extreme cost cutting opportunities. Less data redundancy, higher transactions times, more transparency	**Cost Cutting** Can radically reduce transactions costs. Similar to SAP in the 1990s. Extreme cost cutting opportunities. Less data redundancy, higher transactions times, more transparency

Hellenic Blockchain Hub

Blockchain use cases list by industry

Financial
Trading
Deal origination
POs for new securities
Equities
Fixed income
Derivatives trading
Total Return Swaps (TRS)
2nd generation derivatives
The race to a zero middle office
Collateral management
Settlements
Payments
Transferring of value
Know your client (KYC)
Anti money laundering
Client and product reference data.
Crowd Funding
Peer-to-peer lending
Compliance reporting
Trade reporting & risk visualizations
Betting & prediction markets

Insurance
Claim filings
MBS/Property payments
Claims processing & admin
Fraud prediction
Telematics & ratings

Media
Digital rights mgmt
Game monetization
Art authentication
Purchase & usage monitoring
Ticket purchases
Fan tracking
Ad click fraud reduction
Resell of authentic assets
Real time auction & ad placements

Computer Science
Micronization of work (pay for algorithms, tweets, ad clicks, etc.)
Expanse of marketplace
Disbursement of work
Direct to developer payments
API platform plays
Notarization & certification
P2P storage & compute sharing
DNS

Medical
Records sharing
Prescription sharing
Compliance
Personalized medicine
DNA sequencing

Asset Titles
Diamonds
Designer brands
Car leasing & sales
Home Mortgages & payments
Land title ownership
Digital asset records

Government
Voting
Vehicle registration
WIC, Vet, SS, benefits, distribution
Licensing & identification
Copyrights

Identity
Personal
Objects
Families of objects
Digital assets
Multifactor Auth
Refugee tracking
Education & badging
Purchase & review tracking
Employer & Employee reviews

IoT
Device to Device payments
Device directories
Operations (e.g. water flow)
Grid monitoring
Smart home & office management
Cross-company maintenance markets

Payments
Micropayments (apps, 402)
B2B international remittance
Tax filing & collection
Rethinking wallets & banks

Consumer
Digital rewards
Uber, AirBNB, Apple Pay
P2P selling, craigslist
Cross company, brand, loyalty tracking

Supply Chain
Dynamic ag commodities pricing
Real time auction for supply delivery
Pharmaceutical tracking & purity
Agricultural food authentication
Shipping & logistics management

GDPR compliance is not about the technology, it is about how the technology is used.

Just like there is no Gdpr compliant Internet, or GDPR-compliant artificial intelligence algorithm, **there is no such thing as a GDPR-compliant blockchain technology.**

There are only GDPR-compliant use cases and applications.

Meanwhile, we propose four rule-of-thumb principles that entrepreneurs and innovators can consider:

1. start with the big picture: how is user value created, how is data used and do you really need blockchain?

2. avoid storing personal data on a blockchain. make full use of data obfuscation, encryption and aggregation techniques in order to anonymise data.

3. collect personal data off-chain or, if the blockchain can't be avoided, on private, permissioned blockchain networks. Consider personal data carefully when connecting private blockchains with public ones.

4. continue to innovate, and be as clear and transparent as possible with users.

Web 1.0/ Web 2.0

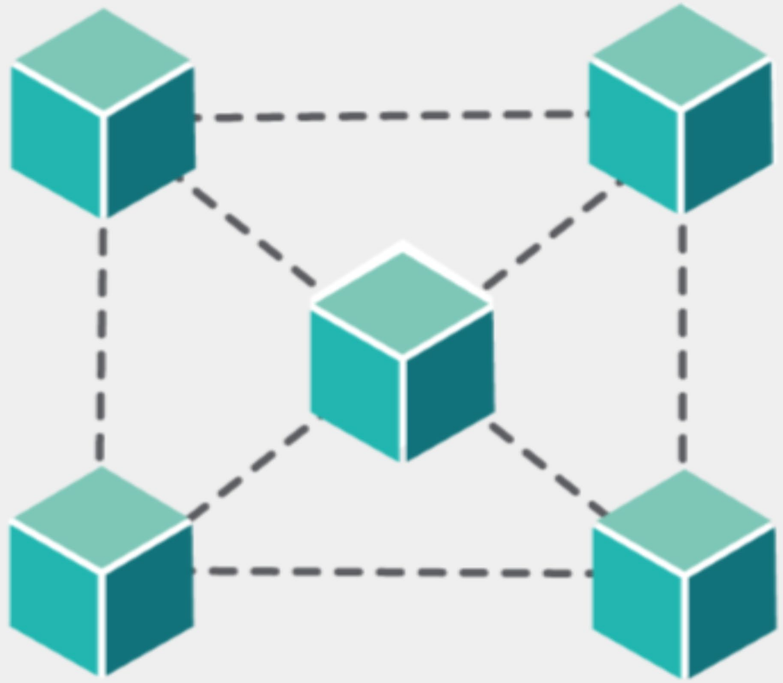
Data is copied

User 1 User 2

VS.

Blockchain

Ownership is transferred



Types of data

- Texts
- Images
- Videos
- Music

Types of transactions

Intangible assets

- Currency
- Shares
- Copyrights
- Patents

Tangible assets

- Real estate
- Goods

Obligations

- Contracts
- Pledges