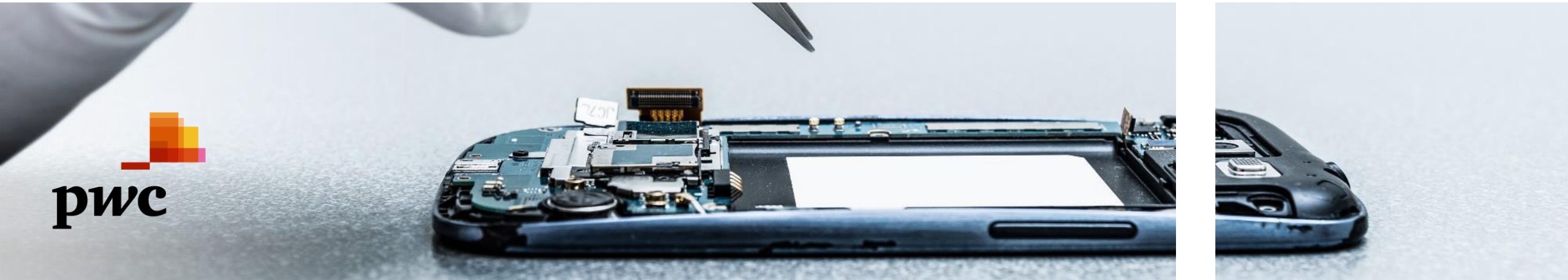
Blockchain and ESG: Friends or Foes?

Assekuranz Arena

Presentation by **Paolo Pamini**
23 June 2023



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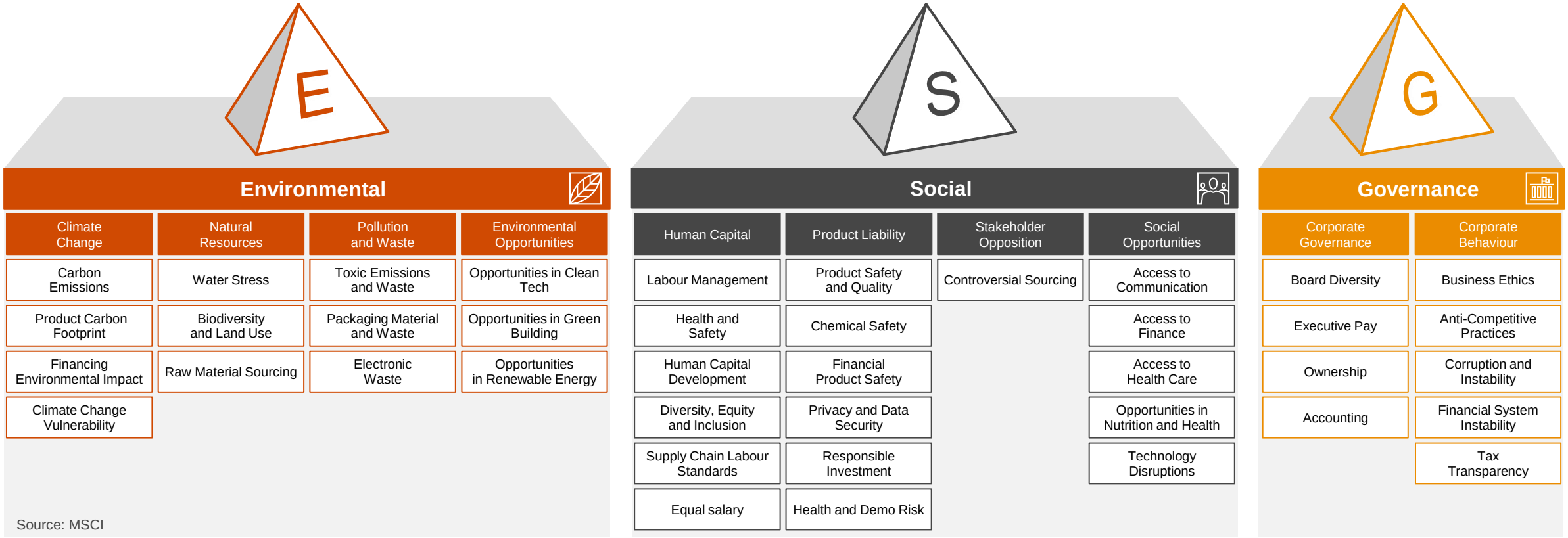
2. ESG

The Three Pillars of ESG

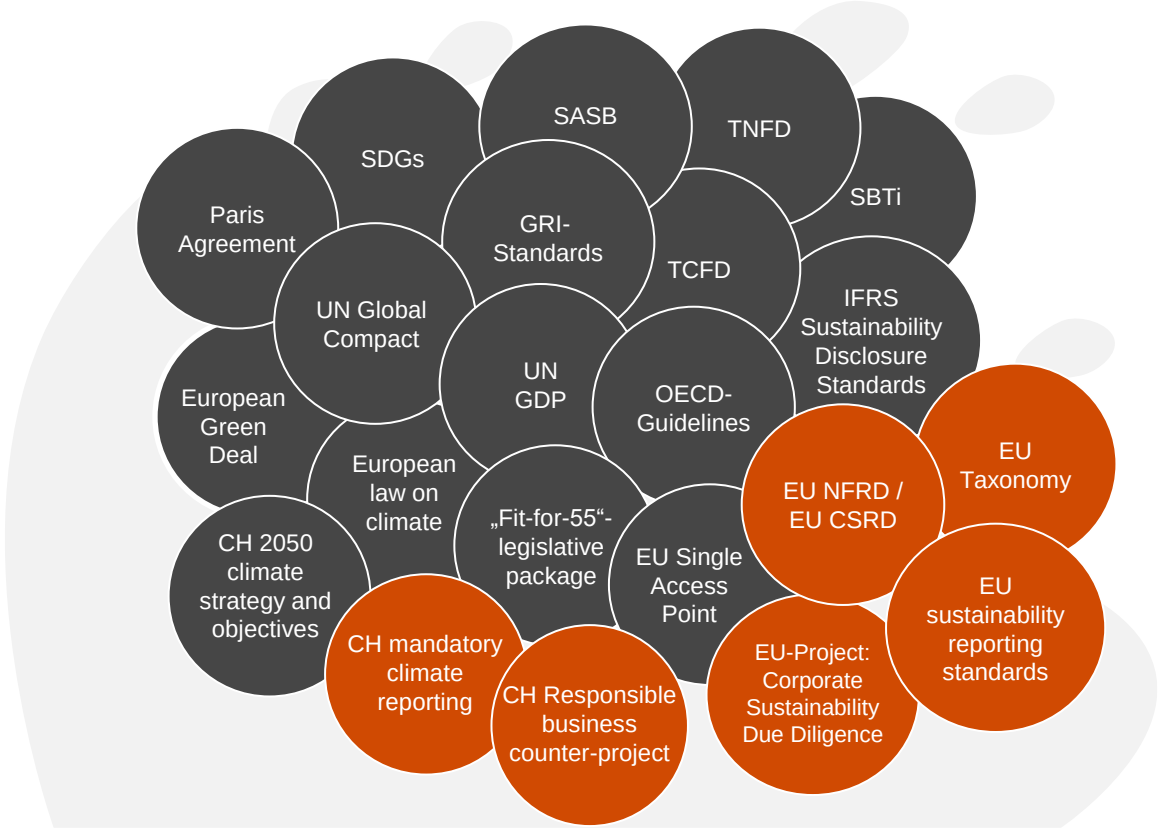
For many people, ESG brings to mind environmental issues like climate change and resource scarcity. These form an important element of ESG, but the term means much more. It also covers social and governance issues. It refers to non-financial factors that investors are increasingly incorporating into their investment decision making. Some of these metrics are more or less applicable to investors.



Source: MSCI

Current developments

Tsunami of ESG standards and regulations



Current developments

- Most existing ESG standards are based on **voluntary application** by companies. As this approach has not led to the desired results globally, the contents of the main ESG standards are gradually being **replaced by binding regulations and standards** or are giving rise to **new binding standards**.
- **The new standards mainly focus on the following two key aspects:**

Communication on sustainability

General communication of sustainability factors in relation to strategy, governance, effects (risks and opportunities), objectives, etc.

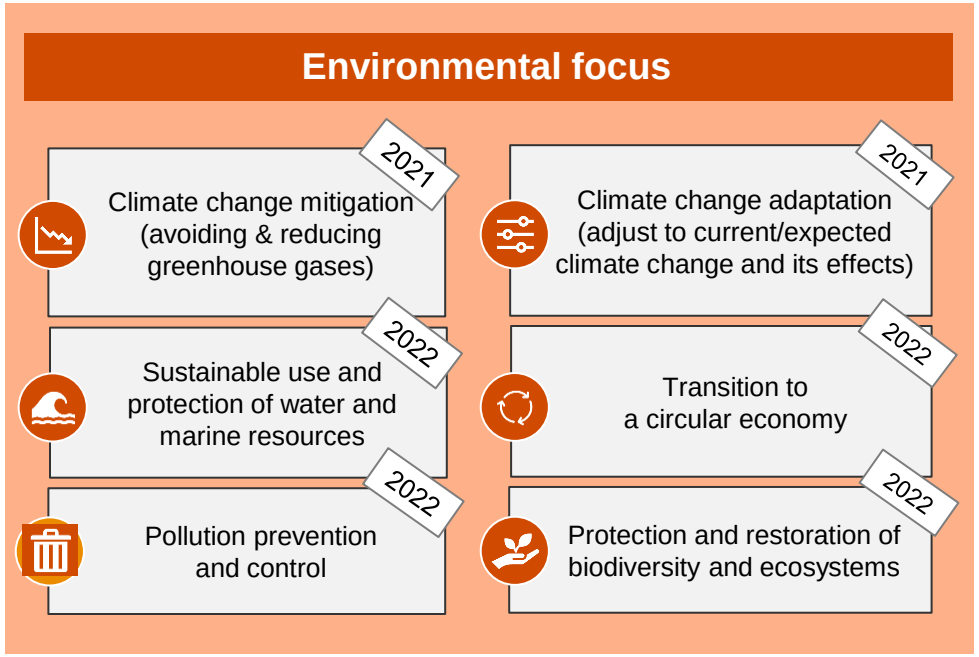
In addition: communication of specific topics concerning **climate risks**.

Sustainability Due Diligence

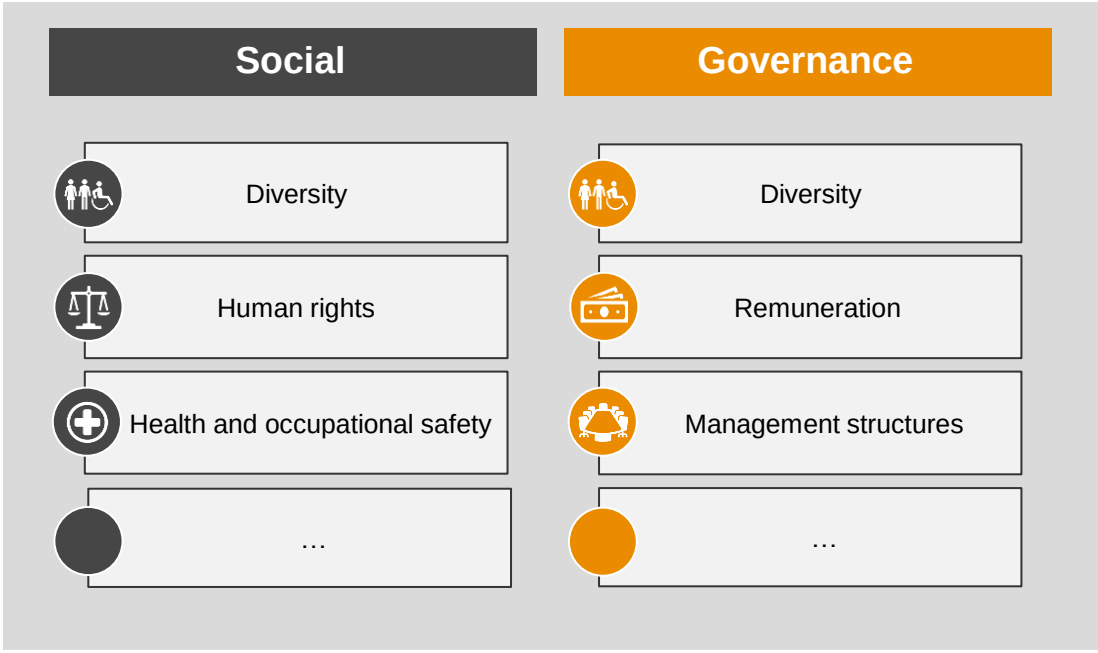
New supply-chain reporting and monitoring obligations, particularly on issues such as child labour, human rights and conflicts generated by mineral extraction.

EU Taxonomy for Sustainable Activities

To comply with the EU taxonomy, **companies must contribute to at least 1 of 6 environmental objectives** without affecting the other objectives



To comply with the EU taxonomy, **companies must meet minimum safeguards** in the fields of social and governance



Principal Sources for ESG Pressure

Stakeholders become conscious of an organisation's ESG performance and are curious to know *'How do you make profits'* rather than *'How much profit do you make'*

Regulators

The ESG regulatory environment remains dynamic

- Nation states typically struggle to regulate MNC's and have focused on activities within their borders, relying on the positive signalling effect of voluntary commitment
- Several countries have opted to impose binding rules and incentive structures regarding transparency, responsible business practices, and emissions
- EU Commission raises climate ambition and proposes a 55% cut in emissions by 2030

Consumers

Consumers expect companies to consider ESG over and above profits[1]

- Consumers are increasingly aware of their consumption decisions and aim to align their purchases with their own values
- Most consumers want companies to actively shape ESG best practices[2]
- They are willing to pay up to 10% more for product from companies that provide greater supply chain transparency[3]

Investors

Investors want consistent information that outlines a plan for long-term value creation

- Investors believe that governance of ESG topics is essential to managing risk, executing strategy and increasing shareholder value
- They are interested in how companies are integrating ESG into their strategy and are seeking metrics alignment with frameworks such as SASB, TCFD, GRI, etc.
- BlackRock and SSGA committed to vote against boards of ESG laggards[4]

Employees

86% prefer to support or work for companies that care about the same issues they do[2]

- Employees said they're more likely to buy from or work for companies that share their values across the various elements of ESG[2]

Sources: *(1) Cone Communications and Ebiquity, Global CSR Study, 2015; (2) PwC Consumer Intelligence Series June 2, 2021 ; (3) MIT management School; (4) BlackRock, Larry Fink CEO Letter (2020) and State Street Global Advisors, CEOs Letter (2020)*

Emerging opportunities from ESG

Increased confidence

- contributes to a positive impact on society and the environment;
- inspires employees to strengthen ties with suppliers and customers.

Risk reduction

- reduces risks related to climate and societal changes;
- better observation and adaptation to existing and future laws/regulations.

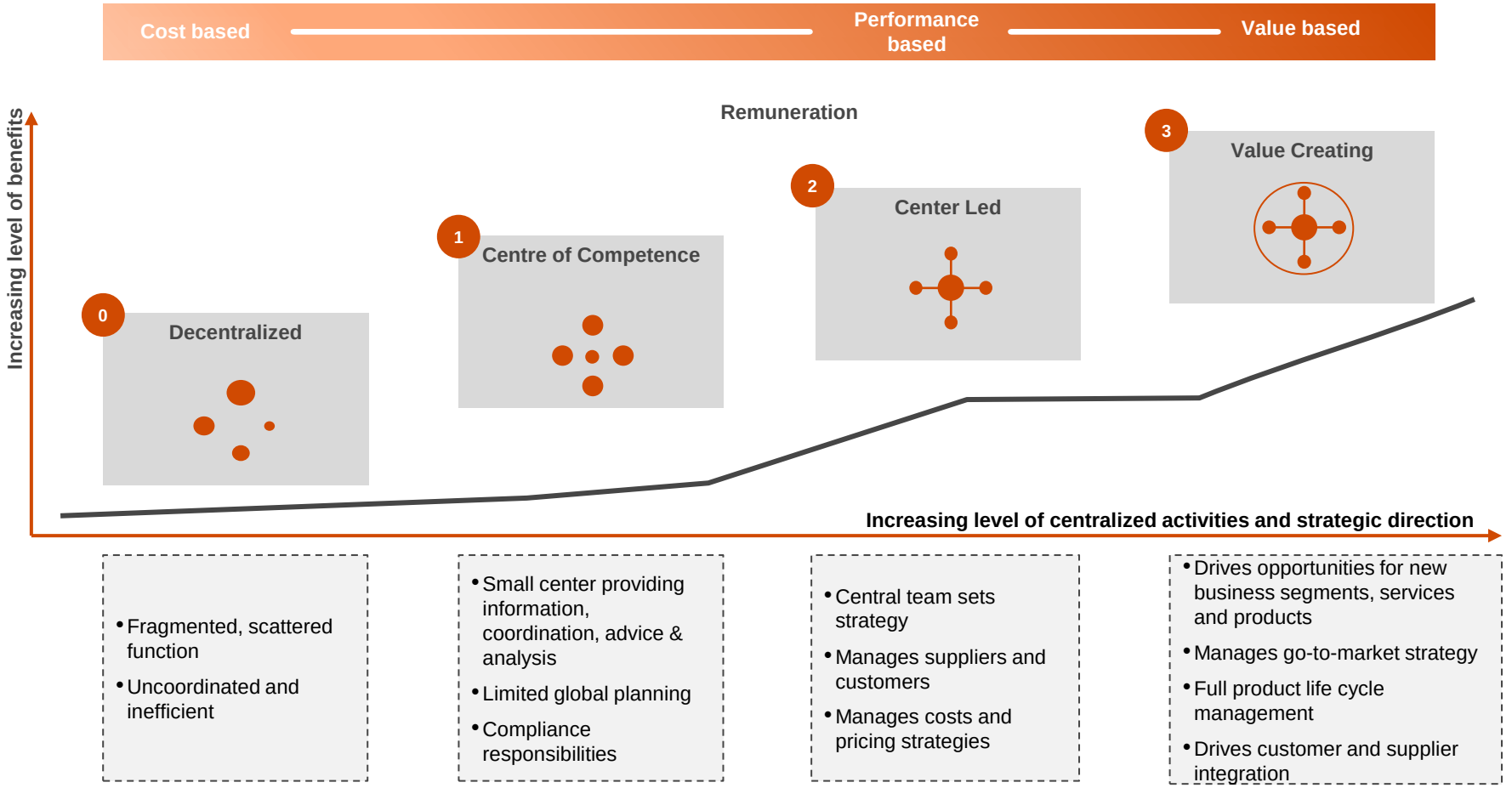
Further growth

- new job opportunities;
- circular economy;
- innovation and technology;
- creation of sustainable solutions.

Reducing costs

- improved efficiency;
- easier access to qualified personnel and capital;
- reduction of environmental taxes

ESG and Business Models



Integration and Development of Holistic ESG Approaches

The first step into ESG …

Make a first step towards launching the ESG initiative(s), e.g.,

- **Awareness** trainings to top and middle management
- **Management workshops** to show benefits and case studies, focusing on the ‘why’

ESG 1.0 – ESG as an initiative

- **Top mgmt. ESG vision** formulated
- **Focus on single or few dimensions**
- ESG **roles and responsibilities** and resources are allocated
- Corporate **initiatives kicked off**
- **Some ESG KPIs** are available
- Aspirational external communications

ESG 2.0 – ESG as a focus area

- **ESG vision communicated within the group**
- **Top mgmt. objectives** and targets
- **HR policies** are reviewed and **aligned to ESG** principles defined by the company (i.e., meritocracy, transparency, objectivity)
- **External communications** focus on targets, progress and success stories

ESG 3.0 – ESG in business strategy

- **ESG is part of a company-wide perspective,** challenging every part of the business to think beyond the standard way of operating
- **ESG vision and objectives are embedded** in the organisational culture and demonstrated in behaviours
- **Multi-dimensional issues** are tackled simultaneously (intersectionality)
- **External communication** through annual reporting **extends what happens internally**, giving voice to people and successful initiatives

Level of organisational Integration of ESG

Source: https://www.spglobal.com/esg/scores/results?cid=4165755 / https://youmatter.world/en/top-10-companies-reputation-csr-2020/

ESG Journey

1. Footprint Optimization
- Carbon footprint analysis;
- Connecting product and corporate carbon footprint by setting targets to formulating actions and realizing results.

2. Product Development & Integrated Engineering
- Circular product lifecycle and portfolio management;
- Product design for sustainability.

3. Connected Supply Chain
- Circular and sustainable supply chain;
- Supply chain visibility & proactive risk management;
- Increased inventories for critical products and dynamic supply chain segmentation.

4. Supplier Network Management
- ESG driven supplier network adjustments;
- Modification of procurement strategies.

5. Smart & Lean Manufacturing
- Sustainable factory design;
- Sustainable lean management.

6. Efficient Transport Management
- Emission reduced transport and packaging;
- Switch to eco-friendly vehicles

7. Intelligent Service & Second Life Solutions
- Empowering waste and 2nd life management ;
- Pay for efficient equipment use.

8. Technology Enablement
- Plant intelligence and automation;
- Leveraging digital platforms & data lakes;
- AI driven analytics.

9. HR / Emloyee Transformation
- Employee empowerment;
- Innovative sustainability communication, change management and training.

Sustainability Controlling, Digital KPI Dashboard and Activity Tracking
- Alignment of top down SBTI targets and EU regulations with operations emission reduction measures
- **Data driven** operations decision making and tracking of emission reduction measures and KPIs

How To Get Started and Critically Review Your ESG Strategy

‘ESG 360° assessment and opportunity spotter’

Critically review your ESG strategy to identify gaps, highlight risks and opportunities to unlock value creation and achieve your sustainability goals:

1 Climate / Environment

➔ **Assess impact of new environmental taxes and incentives**
- Review of Carbon Pricing and environmental taxes
- Identify risks and opportunities around Green taxes and incentives

2 Strategy / Operating model transformation

➔ **ESG Strategy and Operating Model Transformation**
- Understand changes to business strategy and impact of new regulations on business model (new products and solutions, circular economy, M&A target acquisition) to meet net zero targets
- Interviews with key stakeholders to map ESG opportunities along the value chain and identify changes to existing business model
- Identify ESG value drivers and impact on business and transfer pricing model
- Compare with peers / benchmarking (review of ESG rating scores)
- Consider opportunities such as R&D incentives and supply chain optimisation

3 People and workforce

➔ **People and social responsibility**
- Review current reporting and metrics around your company’s social responsibility, equal salary, diversity and inclusion

4 Reporting and transparency

➔ **Tax transparency and ESG reporting (GRI, public CbCR)**
- Compare tax transparency strategy and reporting to sustainability standards (GRI: 207 Tax, WEF IBC’s white paper, DJSI requirements, etc.)
- Assess in scope regulation (CH RBI, CH TCFD, EU CSRD, ISSB)
- Assess readiness to comply with in scope ESG reporting requirements with a view to optimise internal requirements with external requirements
- Assess readiness for obtaining assurance on non-financial reporting

3. Blockchain

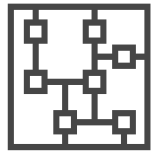
3.1. Is it Useful? How Does It Work?

Why do the following professionals and institutions exist?

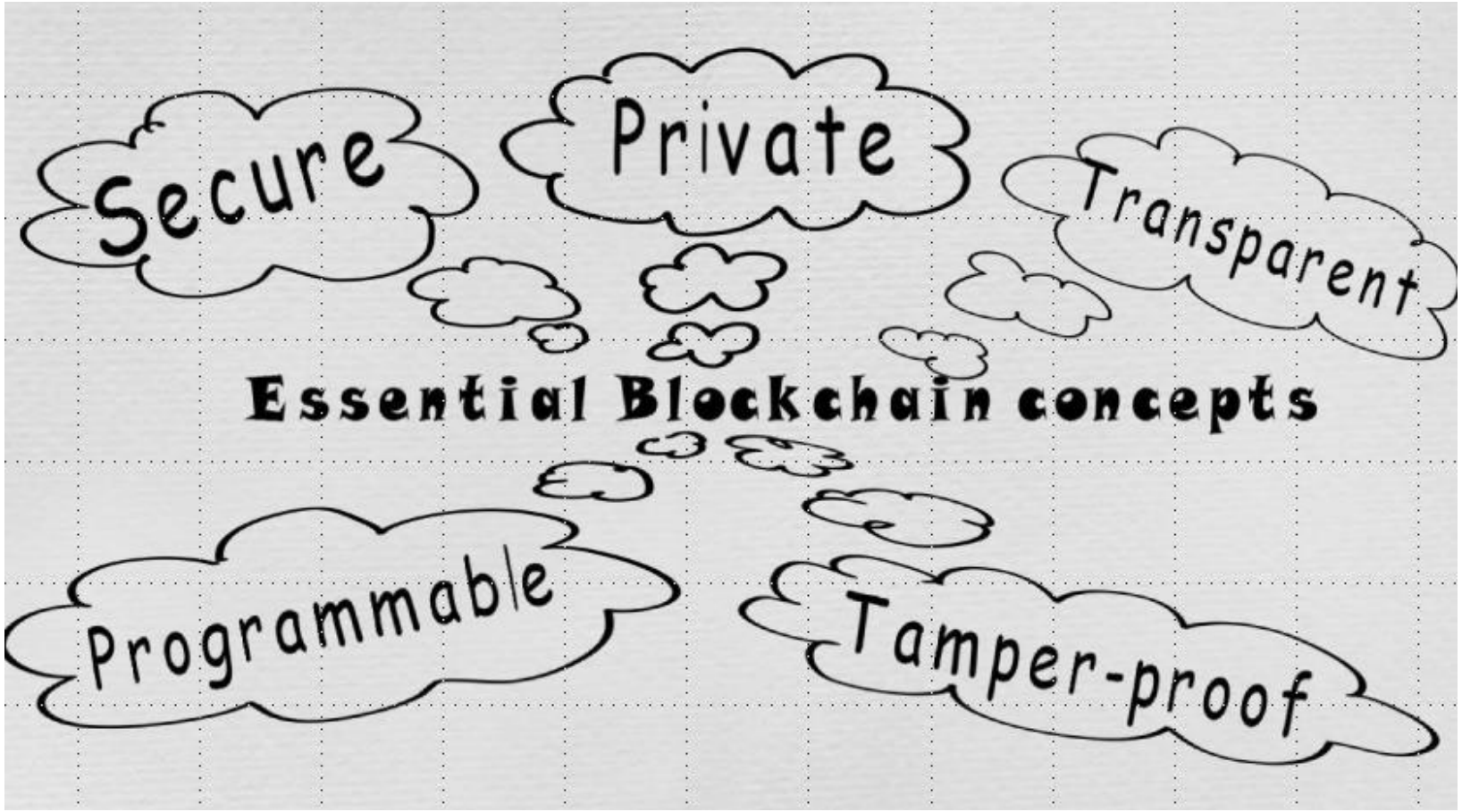
- Notary
- Land Registry
- Trade Registry
- Civil Status Registry
- Residents Registry
- Road Traffic Office



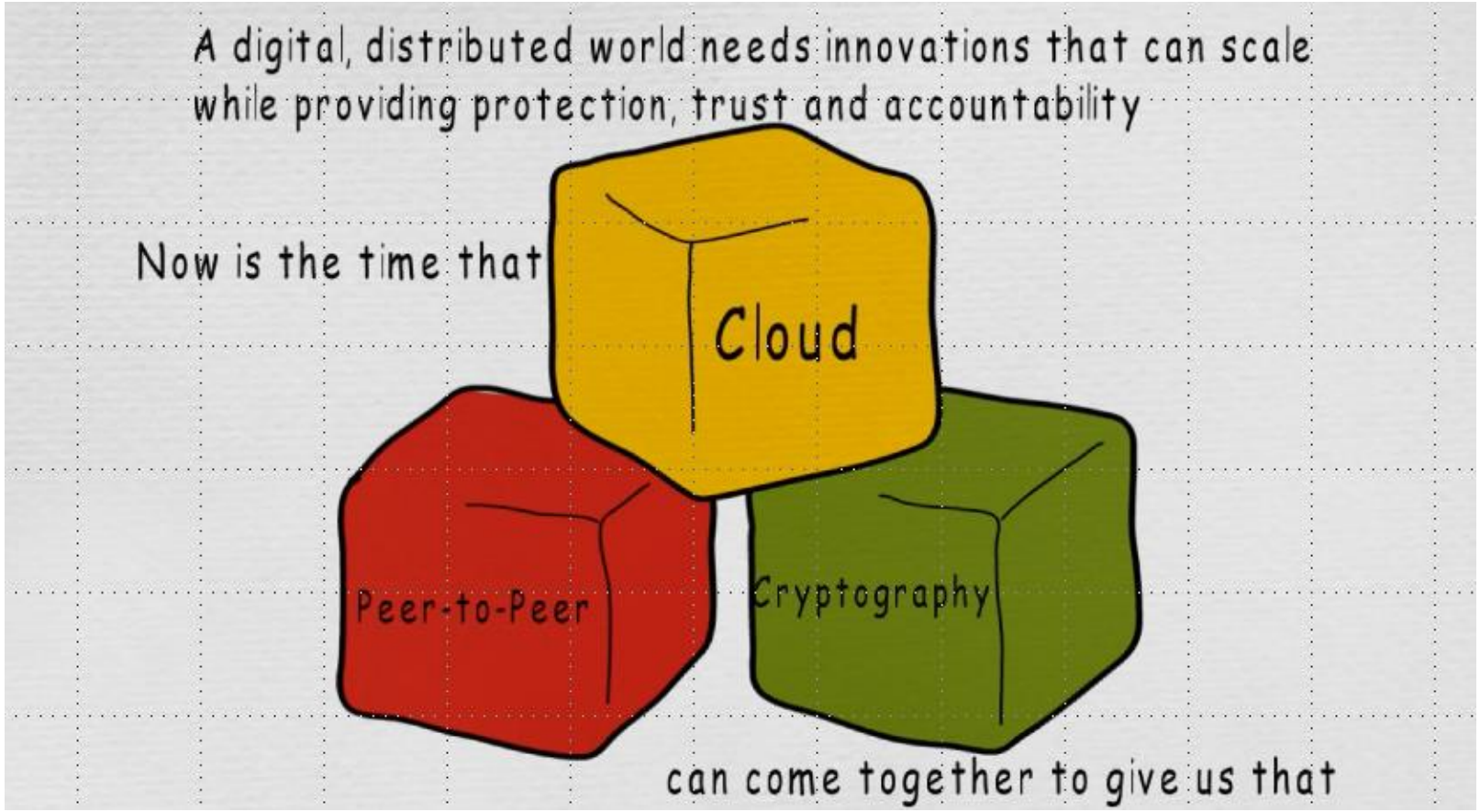


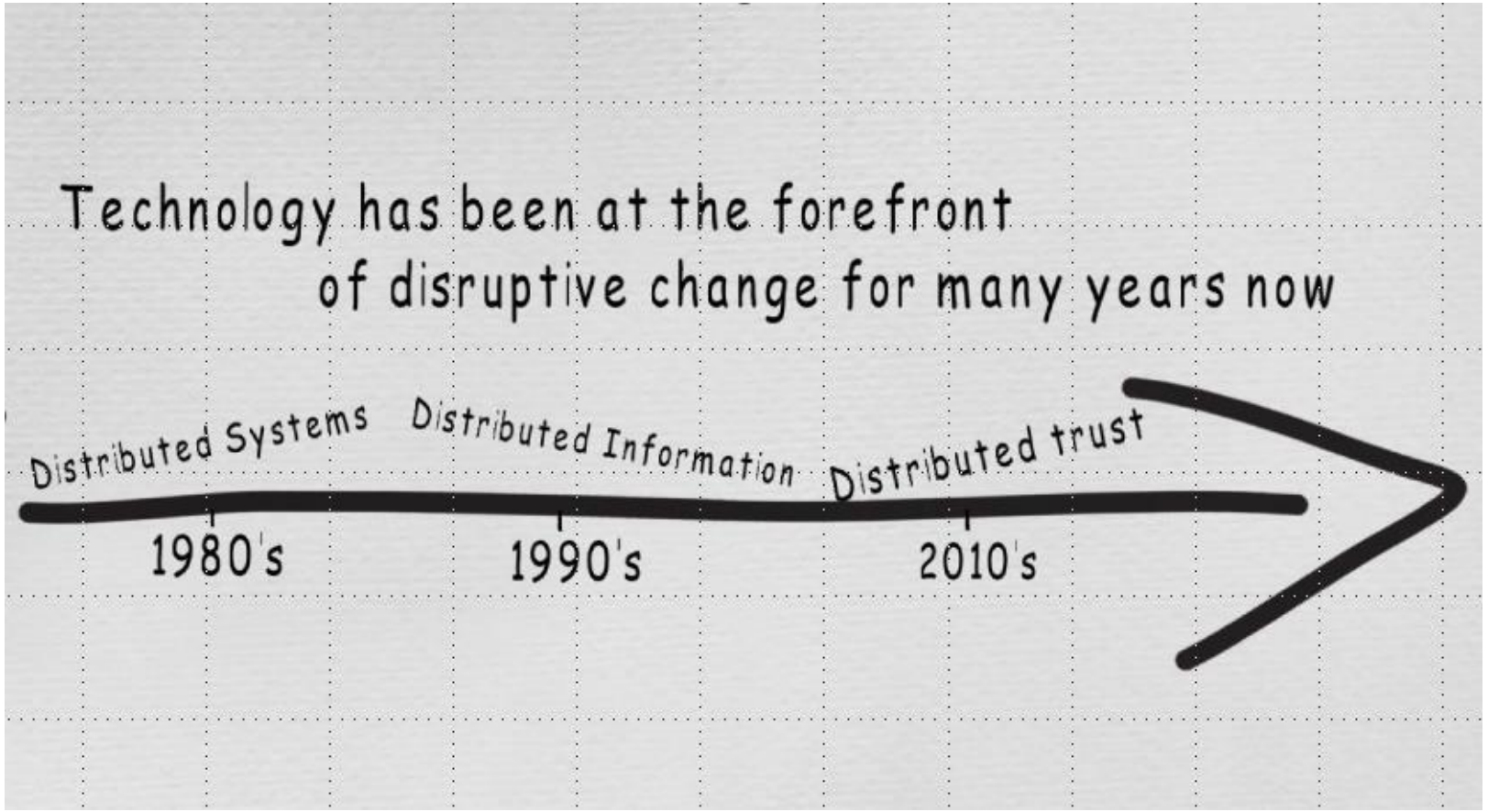
Characteristics



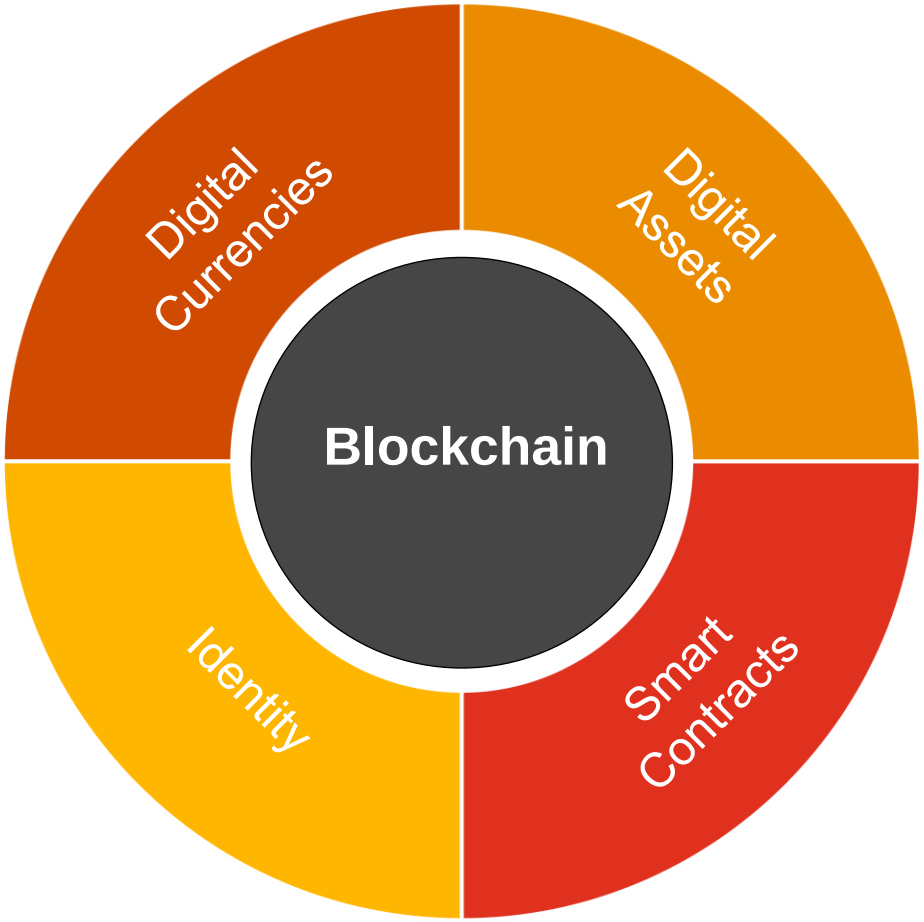
Technology used



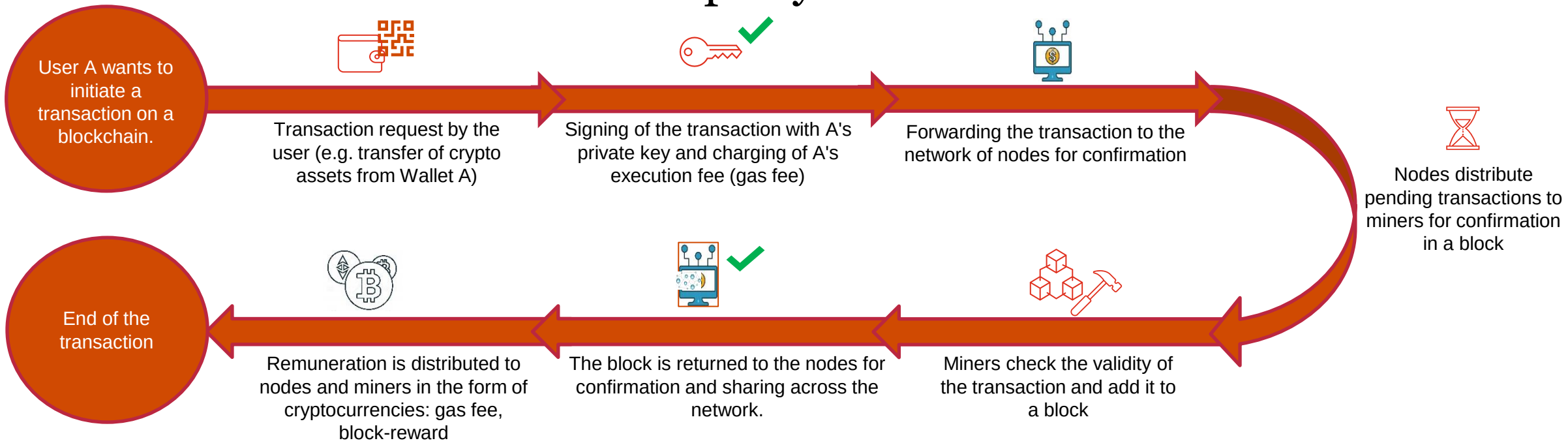
History


Technology has been at the forefront
of disruptive change for many years now
Distributed Systems
Distributed Information
Distributed trust
1980's
1990's
2010's

One Technology, Many Concepts and Uses



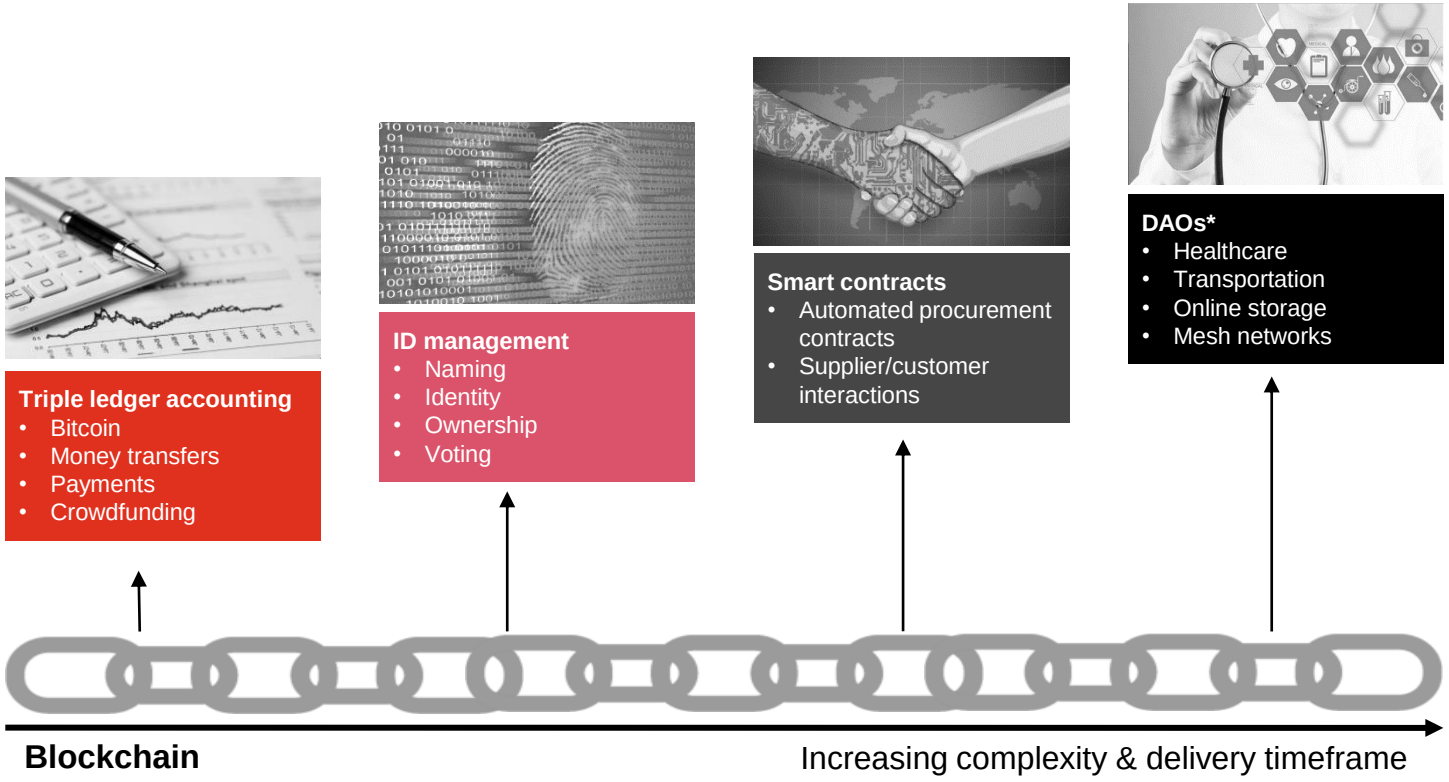
A blockchain is a decentralized ledger of all transactions in a network, with no need for a “trusted third party”



- The types of transactions that are possible on a blockchain depend on the type of blockchain. Bitcoin basically only allows the transfer of BTC, while Ethereum additionally offers the possibility to create and execute smart contracts securely on the blockchain.
- Gas fees: transaction fees (paid in the form of the respective cryptocurrency of the blockchain, e.g. BTC, ETH) to remunerate the activity of the nodes and miners for their confirmation activity.
- Block rewards: cryptocurrencies newly created by the blockchain to remunerate the activity of miners in creating a block.

3.2. Possible Use Cases

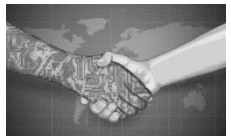
Blockchain-enabled applications are manifold and evolve towards more complex solutions, such as smart contracts and DAOs



*) Decentralized autonomous organizations
Source: http://startupmanagement.org/author/wmougayar/

Smart contracts will disrupt the way we sign and execute contracts and lead to major cost reductions across industries

Blockchain enables "smart contracts" – digital protocols that automatically execute predefined processes of a transaction, without requiring the involvement of a third party (e.g. bank)



Traditional contracts	Smart contracts
1-3 days	Minutes
Manual remittance	Automatic remittance
Escrow necessary	Escrow may not be necessary
Expensive	Fraction of cost
Physical presence (wet signature)	Virtual presence (digital signature)
Lawyers consulted frequently	Lawyers consulted less frequently

New industry opportunities	
Pharma	Smart contract between pharma company and supplier to automate and securely supply and payment
Insurance	Smart contracts enable automatic insurance processing as well as peer-2-peer insurances without any intermediary
Automotive	Through smart contracts, cars will be transformed into a "smart asset" that operates, within the limits set by its users

Companies may save up to 30% of back-office cost thanks to smart contracts*

*) http://www.businesswire.com/news/home/20170117005331/en
Source: PwC Strategy& analysis

Smart-Contracts

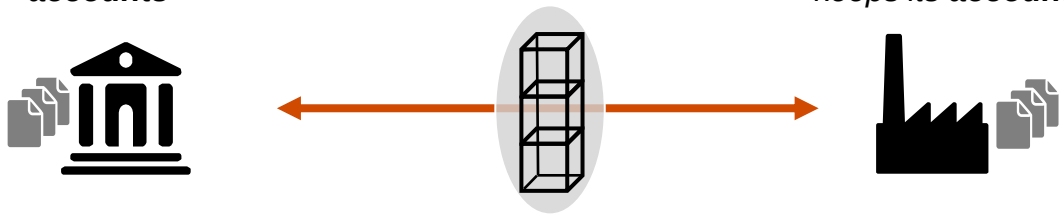
Description	• Informatics programs developed and stored within a blockchain (Ethereum, Polkadot ...). • Allow the automatic execution of a transaction based on an "if [...], then [...] rule" verified in the blockchain. • Usually irreversible and cannot be changed (even if there are errors in the code)
Object	• Simplifying a transaction by eliminating intermediaries • Shortening of payment periods • Reduce the risk of errors and at the same time ensure the authenticity and traceability of the transaction (audit trail).
Applications	• ***Decentralized applications*** **(dApps)**: – **Decentralized Finance (DeFi)** : Blockchain serves as an "intermediary and aggregator" of transactions, and trades (e.g. letters of credit); investments or loans are settled via smart contracts; – **Decentralized Exchanges (DEXs)**: Peer-to-peer trading platforms on which actors execute their transfer orders via smart contracts without intermediaries or certifying third parties; – **Decentralized Autonomous Organization (DAOs)**: Management and administration of decentralised companies (voting rights and organised decision-making processes via smart contracts); – **NFTs**: Created via smart contracts; – **Internet Of Things (IoT)**: Decentralised and secure access control to networked objects; – **Initial Coin Offering (ICO)**: Use of smart-contracts to conduct a token issue.

Blockchain will ring in the age of “triple-ledger accounting”

Triple-ledger accounting (also triple-entry accounting) is an enhancement to the traditional double-entry system in which all accounting entries involving outside parties are cryptographically sealed by a third entry. In blockchain environment this third entry is written on the distributed ledger

*First company keeps its **accounts***

*Second company keeps its **accounts***



*All transactions are written on the **distributed ledger** and accessible for third parties if needed/agreed*

Benefits of blockchain-based accounting

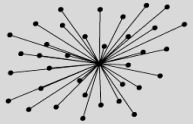
- Permanent, tamper-proof recording of supply chain transactions in the block-chain for efficient and reliable auditing
- Auditor could be given access to all transactions and full history:
  - Efficient audits of transactions and trade partners
  - Pairing with Big Data analysis to efficiently identify irregular transactions

Blockchain will disrupt accounting and auditing standards drastically, affecting all industries

Source: PwC Strategy& analysis, http://iang.org/papers/triple_entry.html

Indeed, blockchain has the potential to disrupt all industries…

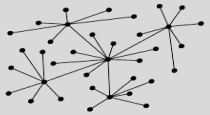
Past



Traditional economy:
Closed and centralized network

THE WALL STREET JOURNAL. Hilton

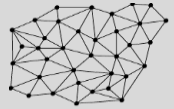
Present



Sharing economy:
Decentralized network with several nodes

airbnb facebook

Future



Distributed economy:
Networks with distributed ledger

synereo VERISART

Insurance

Blockchain can help to reduce fraud and offer a better user experience to customers

Banking

Faster, cheaper settlements could shave billions of dollars from transaction costs while improving transparency

Cyber Security

The blockchain technology can prevent attacks such as distributed denial of services (DDoS)

Government

Using blockchain constituents could casts digital votes resulting in immediately verifiable results

Automotive

Consumers could use the blockchain to manage fractional ownership in autonomous cars

Retail

Global supply chains could become more secure due to better transparency and accountability with blockchain technology

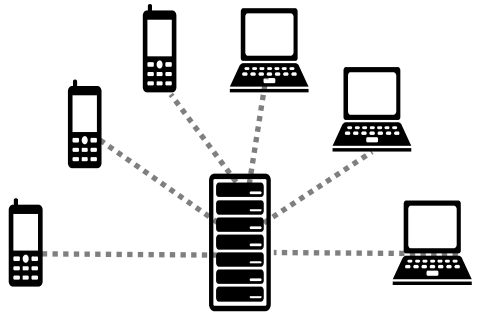
Pharma/Healthcare

Patients' encrypted health information could be shared without the risk of privacy breaches

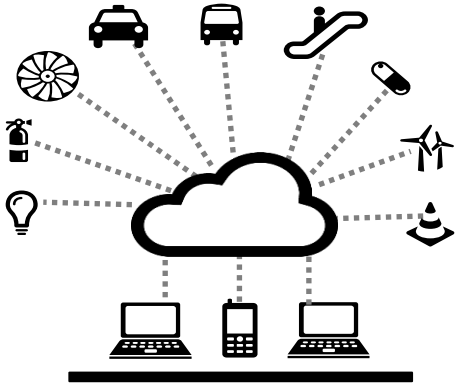
Legal

Smart contracts offer new opportunities for law firms

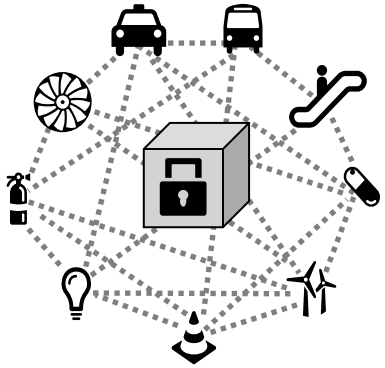
…and is the missing link to the Internet of Things (IoT)



Closed and centralized "IoT" networks



Open access IoT network, centralized cloud



Open access IoT networks, distributed cloud, based on BC

IoT in combination with Blockchain:

- The decentralized blockchain approach eliminates single points of failure, creating a more resilient ecosystem for devices to run on
- The cryptographic algorithms used by blockchains make consumer data more private and secure
- Blockchain's scalability makes Internet of Things cost efficient

Blockchain is the missing link that settles scalability, privacy, and reliability concerns in the IoT

3.3. Bitcoin and Mining

How does blockchain mining work?

SHA256(Block Number, Data, Previous Block's Hash) → Hash

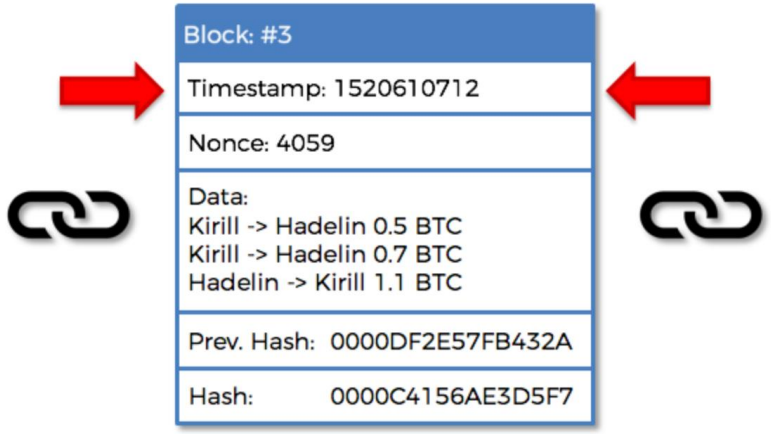
The cryptographic puzzle requires miners to find a hash smaller than the set target for it to be valid

Source: Medium, How does Bitcoin/blockchain mining works?

How does blockchain mining work?

SHA256(Block Number, Timestamp, Nonce, Data, Previous Block's Hash) → Hash

Timestamp representing the current Unix time (number of seconds elapsed since 1st January 1970), that means timestamp is constantly refreshing!



Source: Medium, How does Bitcoin/blockchain mining works?

How difficult it is to find a private key?

The odds of guessing winning Powerball numbers vs. guessing one Bitcoin private key.
YOU WOULD HAVE TO WIN POWERBALL ~9 TIMES IN A ROW

Bits	Size of Space	
1	2	
10	1,024	
20	1,048,576	
28.121	292,000,000	Winning PowerBall
30	1,073,741,824	
40	1,099,511,627,776	
50	1,125,899,906,842,620	
60	1,152,921,504,606,850,000	
70	1,180,591,620,717,410,000,000	
80	1,208,925,819,614,630,000,000,000	
90	1,237,940,039,285,380,000,000,000,000	
100	1,267,650,600,228,230,000,000,000,000,000	
110	1,298,074,214,633,710,000,000,000,000,000,000	
120	1,329,227,995,784,920,000,000,000,000,000,000,000	
130	1,361,129,467,683,750,000,000,000,000,000,000,000,000	
140	1,393,796,574,908,160,000,000,000,000,000,000,000,000,000	
150	1,427,247,692,705,960,000,000,000,000,000,000,000,000,000,000	
160	1,461,501,637,330,900,000,000,000,000,000,000,000,000,000,000,000	
170	1,496,577,676,626,840,000,000,000,000,000,000,000,000,000,000,000,000	
180	1,532,495,540,865,890,000,000,000,000,000,000,000,000,000,000,000,000,000	
190	1,569,275,433,846,670,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
200	1,606,938,044,258,990,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
210	1,645,504,557,321,210,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
220	1,684,996,666,696,920,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
230	1,725,436,586,697,640,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
230.186	1,962,577,783,683,320,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000.00	Guessing any Bitcoin Private Key with a Balance
240	1,766,847,064,778,380,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	
256	115,792,089,237,316,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	Guessing a Specific Bitcoin Private Key

3.4. Several Types of Tokens and Blockchains

Types of Token
(non exhaustive list)

Payment-Token

- Creation on the basis of a blockchain (coins)
- Numerical representation of a security that is not issued or guaranteed by a central bank
- Not necessarily tied to a currency that is considered a legal payment method (Fiat)
- Are recognised as a medium of exchange in "on-chain" transactions, as a unit of account or value (or even as an escape currency)
- Examples: BTC, ETH, ADA, SOL, DOT

Usage-Token

- Through the use of smart contracts on an existing blockchain (e.g. ERC-20 standard).
- Tokens that provide access to a platform or service.
- In addition, they also serve as a unit of value or exchange value
- Generally issued in limited numbers (total supply)
- Examples: UNI, BNB

Asset-backed Token

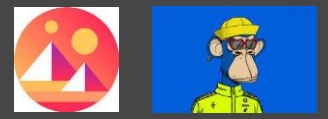
- Usually created through the use of smart contracts on an existing blockchain (e.g. ERC-20 standard).
- Tokens linked to a real-world underlying asset (e.g. Fiat).
- Stablecoins : "backed" by an underlying asset as a reserve.
- !: can be structured as security tokens
- Example: USDT

Investment-Token

- Usually created through the use of smart contracts on an existing blockchain/platform (e.g. ERC-20 standard).
- Have the characteristics of securities, derivatives, fund units.
- Offer a return for the investor
- Examples: Spice

Non-fungible-Token

- Usually created through the use of smart contracts (e.g. ERC-721 and ERC-1155 standard).
- Unique digital representation
- Tokens that cannot be exchanged (i.e. are not fungible).
- Are usually issued in limited numbers (attested)
- Examples: MANA, Bored Ape NFTs



Types of Blockchains

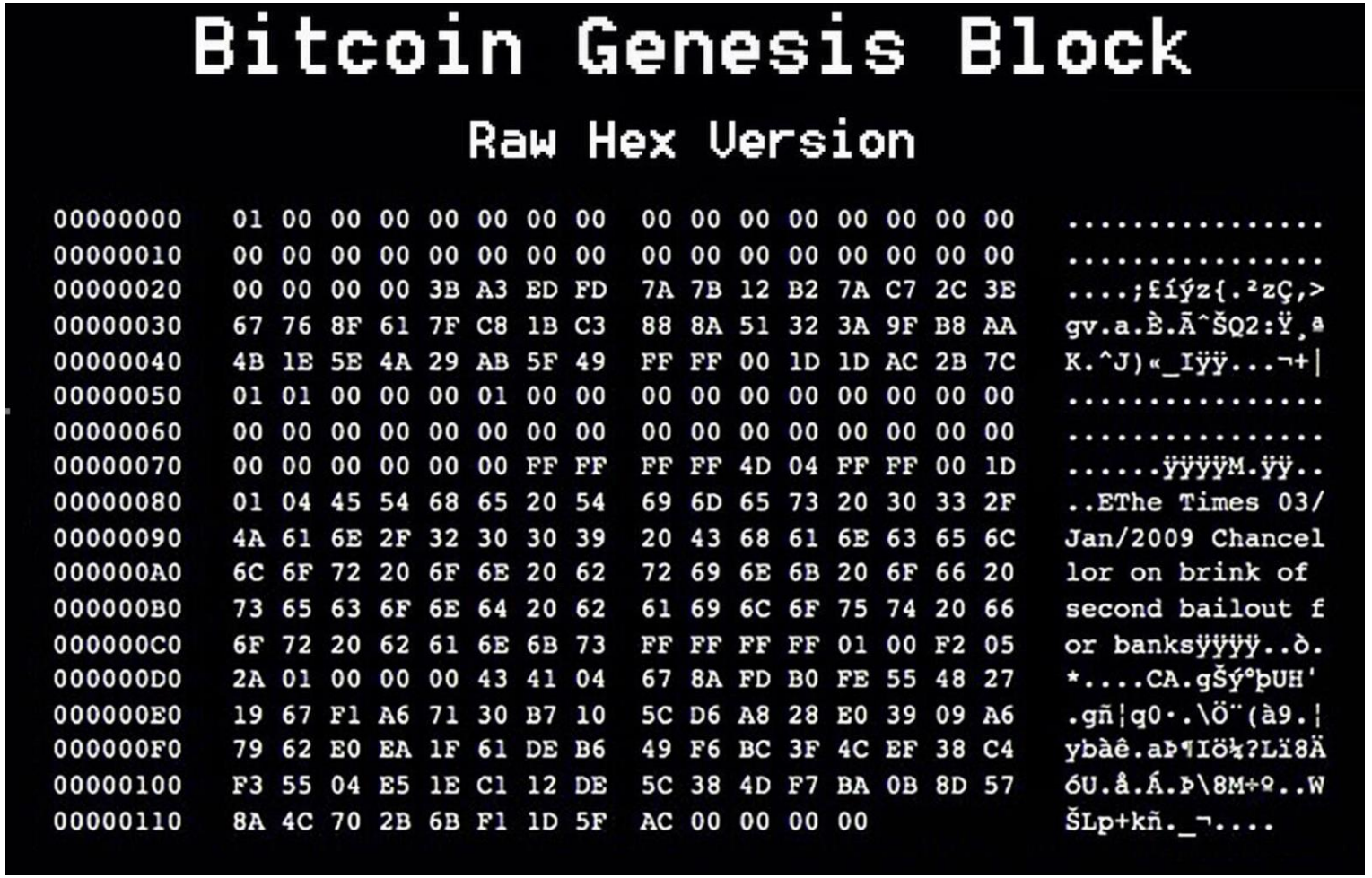
- Database or register (*Distributed Ledger Technology,* «DLT»)
- Data is shared with all users simultaneously, i.e. distributed and "instantly" updated
- Accessible, readable and modifiable by all users, i.e. decentralised management
- Modifiable on the basis of a computer protocol:
  - According to various consensus methods (e.g., PoW/PoS)
  - Enables the addition, temporal registration, confirmation and synchronisation of registered transactions
- Cryptographically secured

Type of Blockchain	Readers' register	Transaction realisation	Validation	Example
Open	Open for all	Anyone	Anyone, provided they make a significant investment in computing power (proof of work) or in holding cryptocurrency (proof of stake)	Bitcoin, Ethereum
	Open for all	Authorised participants	All or some of the authorised participants	Sovrin
Closed	Restricted to authorised participants	Authorised participants	All or some of the authorised participants	Banks that maintain a common general ledger
	Completely private or limited to a number of permissible nods	Limited to network operators	Limited to network operators	Internal register of a joint subsidiary bank

Source: Global Blockchain Benchmarking study, Dr Garrick Hileman et Michel Rauchs, 2017

3.5. Examples of Concrete Use Cases

3 January 2009 – The Bitcoin genesis block



3 January 2009 – The Times first page

Chancellor on brink of second bailout for banks

Billions may be needed as lending squeeze tightens

Francis Elliott Deputy Political Editor
Gary Duncan Economics Editor

Alistair Darling has been forced to consider a second bailout for banks as the lending drought worsens.

The Chancellor will decide within weeks whether to pump billions more into the economy as evidence mounts that the £37 billion part-nationalisation last year has failed to keep credit flowing. Options include cash injections, offering banks cheaper state guarantees to raise money privately or buying up "toxic assets", *The Times* has learnt.

The Bank of England revealed yesterday that, despite intense pressure, the banks curbed lending in the final quarter of last year and plan even tighter restrictions in the coming months. Its findings will alarm the Treasury.

The Bank is expected to take yet more aggressive action this week by cutting the base rate from its current level of 2 per cent. Doing so would reduce the cost of borrowing but have little effect on the availability of loans.

Whitehall sources said that ministers planned to "keep the banks on the boil" but accepted that they need more help to restore lending levels. Formally, the Treasury plans to focus on state-backed gurantees to encourage private finance, but a number of interventions are on the table, including further injections of taxpayers' cash.

Under one option, a "bad bank" would be created to dispose of bad debts. The Treasury would take bad loans off the hands of troubled banks, perhaps swapping them for government bonds. The toxic assets, blamed for poisoning the financial system, would be parked in a state vehicle or "bad bank" that would manage them and attempt to dispose of them while "detoxifying" the mainstream banking system.

The idea would mirror the initial proposal by Henry Paulson, the US Treasury Secretary, to underpin the American banking system by buying

99p

Pub chain cuts the price of a pint from £1.69 to 1989 levels

Business, page 47

Continued on page 6, col 1

Leading article, page 2

THE TIMES

Saturday January 3 2009 timesonline.co.uk No 69523 £1.50

Eat Out from £5

More than 900 great restaurants, including four **Gordon Ramsay** favourites from £15

Start collecting tokens today Pullout inside

Israel prepares to send tanks and troops into Gaza

Israel allowed foreigners to flee the Gaza Strip as it prepared for a ground offensive. At least 430 Palestinians were killed in a week of airstrikes News, page 3

Michael Sheen Frost, Nixon and me

Magazine

Working mums So that's how she does it

Body&Soul

Detox in style The best spas on the planet

Travel

Salman Rushdie I won't marry again

Pages 22, 23

Giant killing? Guide to the FA Cup third round

Sport

Chancellor on brink of second bailout for banks

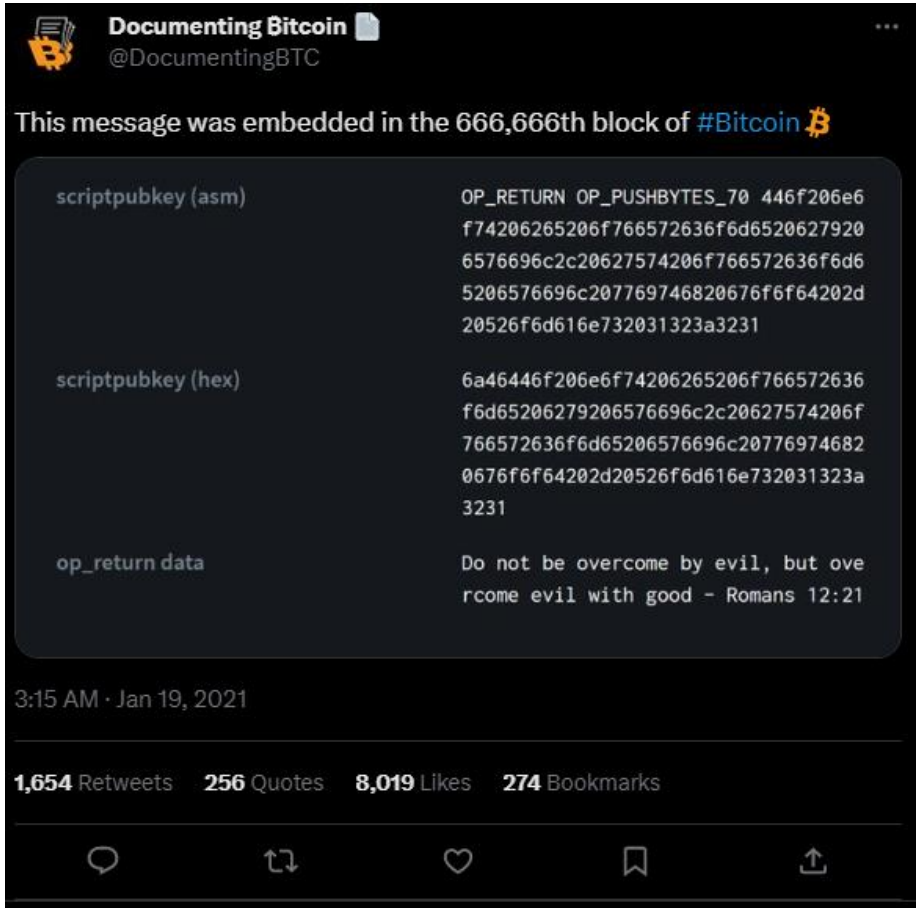
Billions may be needed as lending squeeze tightens

Practical uses

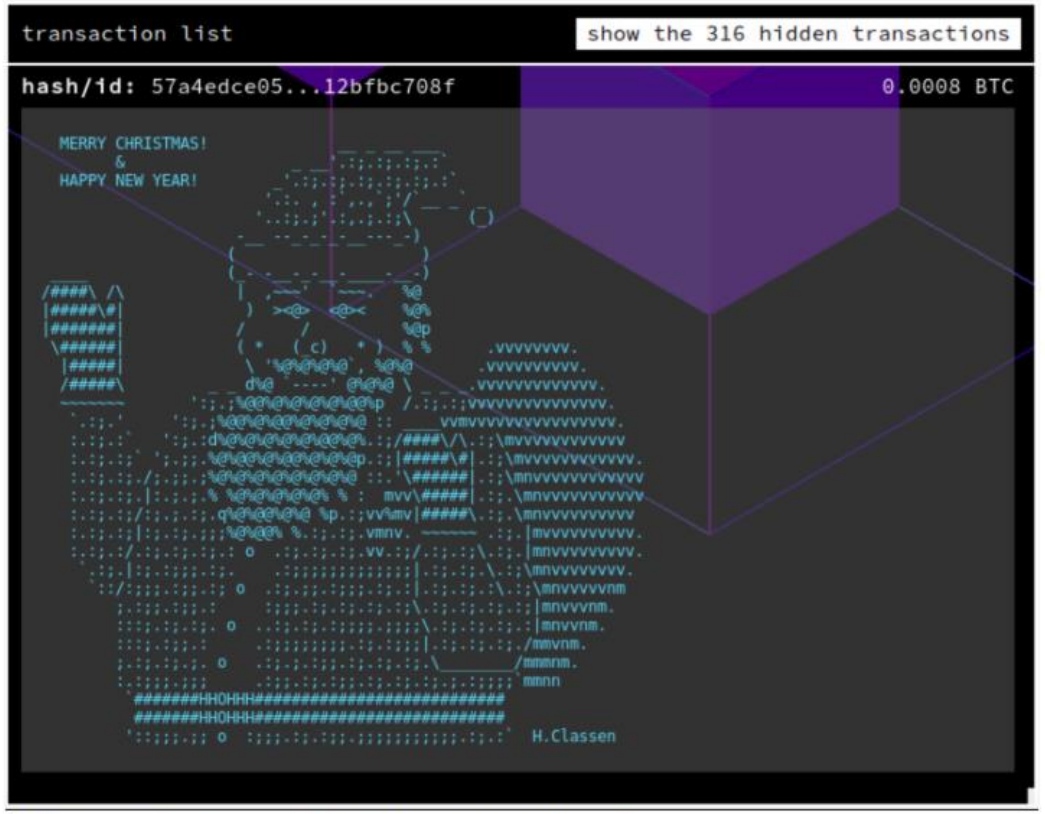
- BTC used to transfer tokens, but in theory also usable for writing public or encrypted messages
  - https://eternitywall.it/about/
  - https://cryptonews.net/news/bitcoin/457754/

- Lightning Network as a solution to enable small payments
  - E.g. use in Lugano in several hundred shopkeepers alongside LVGA and USDT
  - https://planb.lugano.ch/accept-crypto-payments/

Eternity Wall



Source: https://twitter.com/DocumentingBTC/status/1351352557290086400



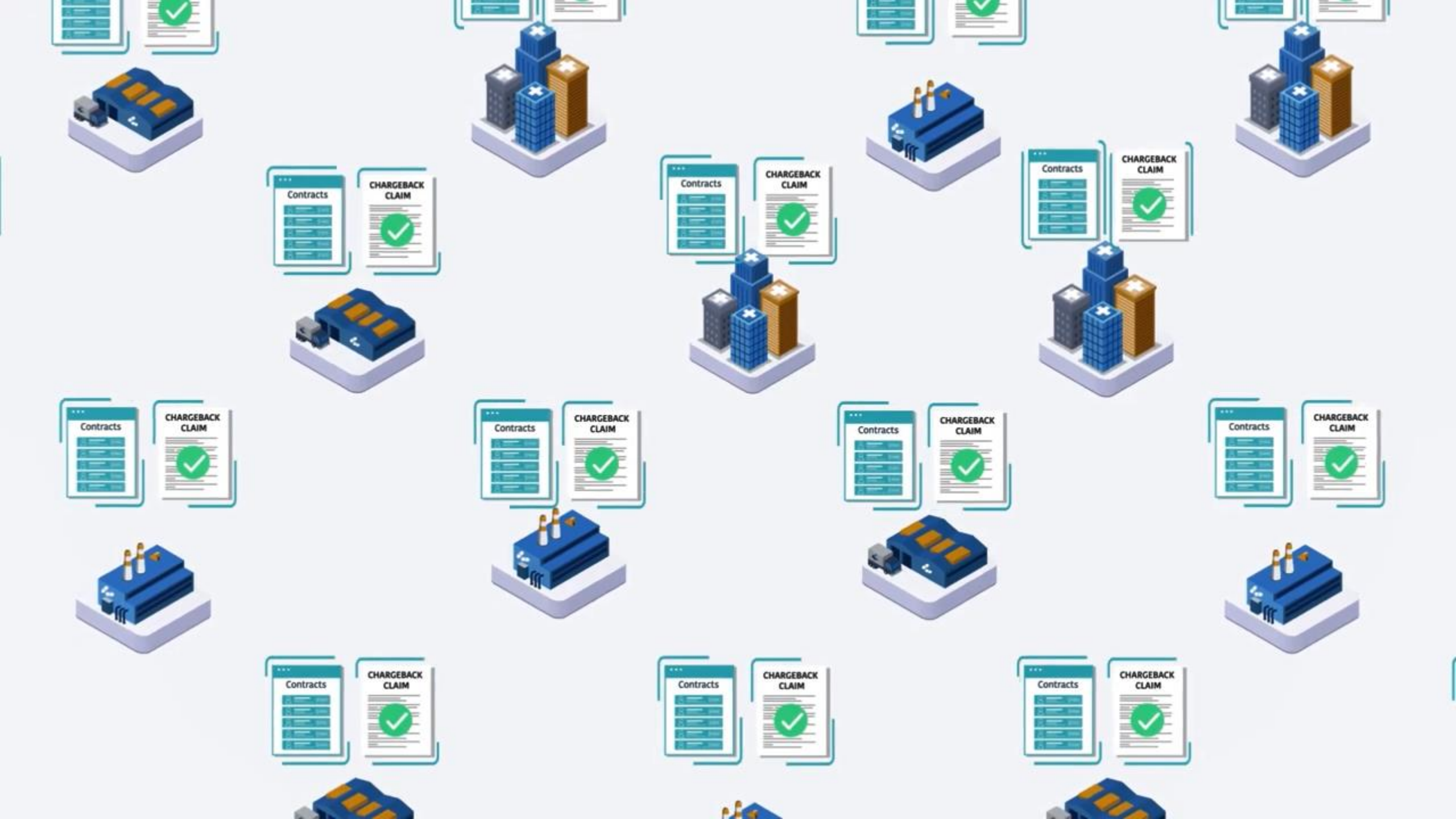
H. Classen's Merry Christmas. Image: Messages from the mines.

ASCII art is a popular Easter egg, and Bitcoiner H. Classen's Merry Christmas, posted on December 19, 2014, is another great example.

Source: https://twitter.com/DocumentingBTC/status/1351352557290086400

Use Cases

- **Financial infrastructure**
  - Payments;
  - Trade settlement;
  - Digital representation of securities;
  - asset splits, e.g. co-ownership of real estate;
- **Trade finance**
- **Track-and-trace in supply chains**
  - Provenance of food;
  - Provenance of materials and parts;
  - Luxury goods verification;
  - Provenance and verification of drugs;
- **Secure private messaging**
- Pharmaceutical contract management;
- Archiving and retrieval of patient data;
- Compliance - Automation of processes;
- Impact investing;
- Music rights/copyrights (NFT);
- «Play-to-earn-2 video games» (NFT);
- **Governance**
  - Identity management;
  - Voting;
  - Property transfer and protection;
  - Intellectual property rights management;
- **Document authentication**


Contracts
CHARGEBACK CLAIM

4. Friends or Foes?

Friends or foes?

Differences and similarities

Environment

- Energy consumption (Proof of work)
- Symbiotic to renewables

Social

- Supply chain documentation and standards
- Access to information
- Financial security

Governance

- Transparency
- Information retention
- Trust issues

Common origins

- Increasingly interdependent global society (division of labour, diminishing barriers)
- Problem of trust in counterparties and institutions
  - ESG – top-down (although initially voluntary) – solves it with new standards and regulations
  - Blockchain – bottom-up – solves it with trustless approach

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Thank you