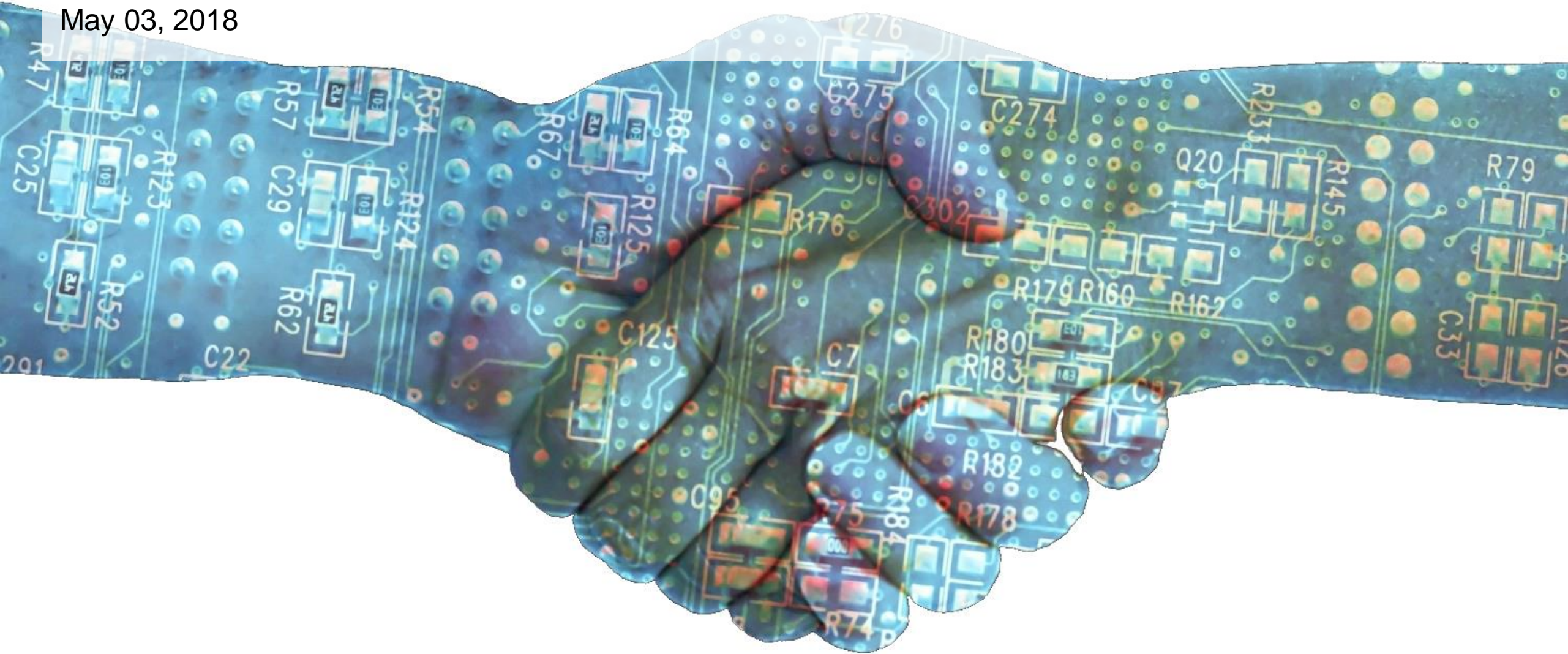


IoT and Blockchain

Vladimir Savchenko
May 03, 2018



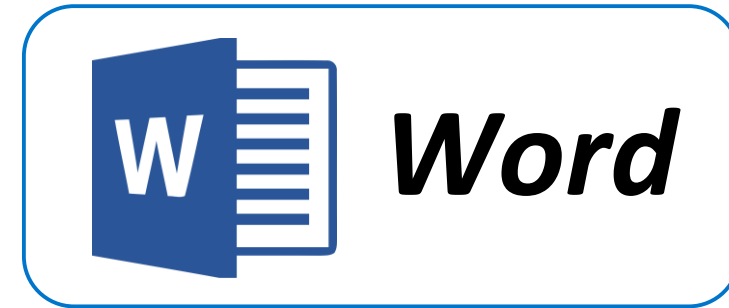
Cryptocurrencies vs Blockchain



Bitcoin Blockchain

Cryptocurrencies

Blockchain



Microsoft Office

Office Tools

Software

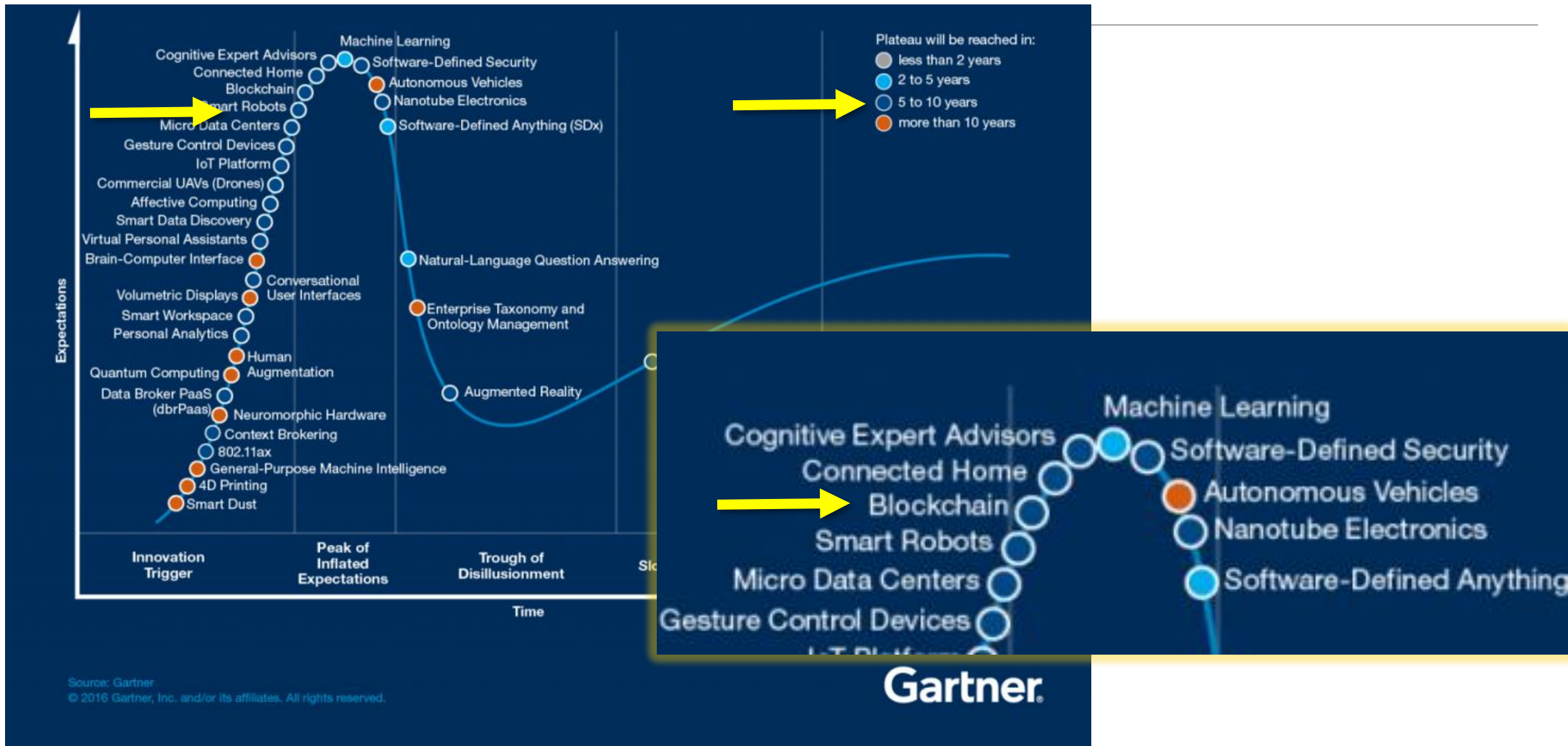
What is a Block Chain?



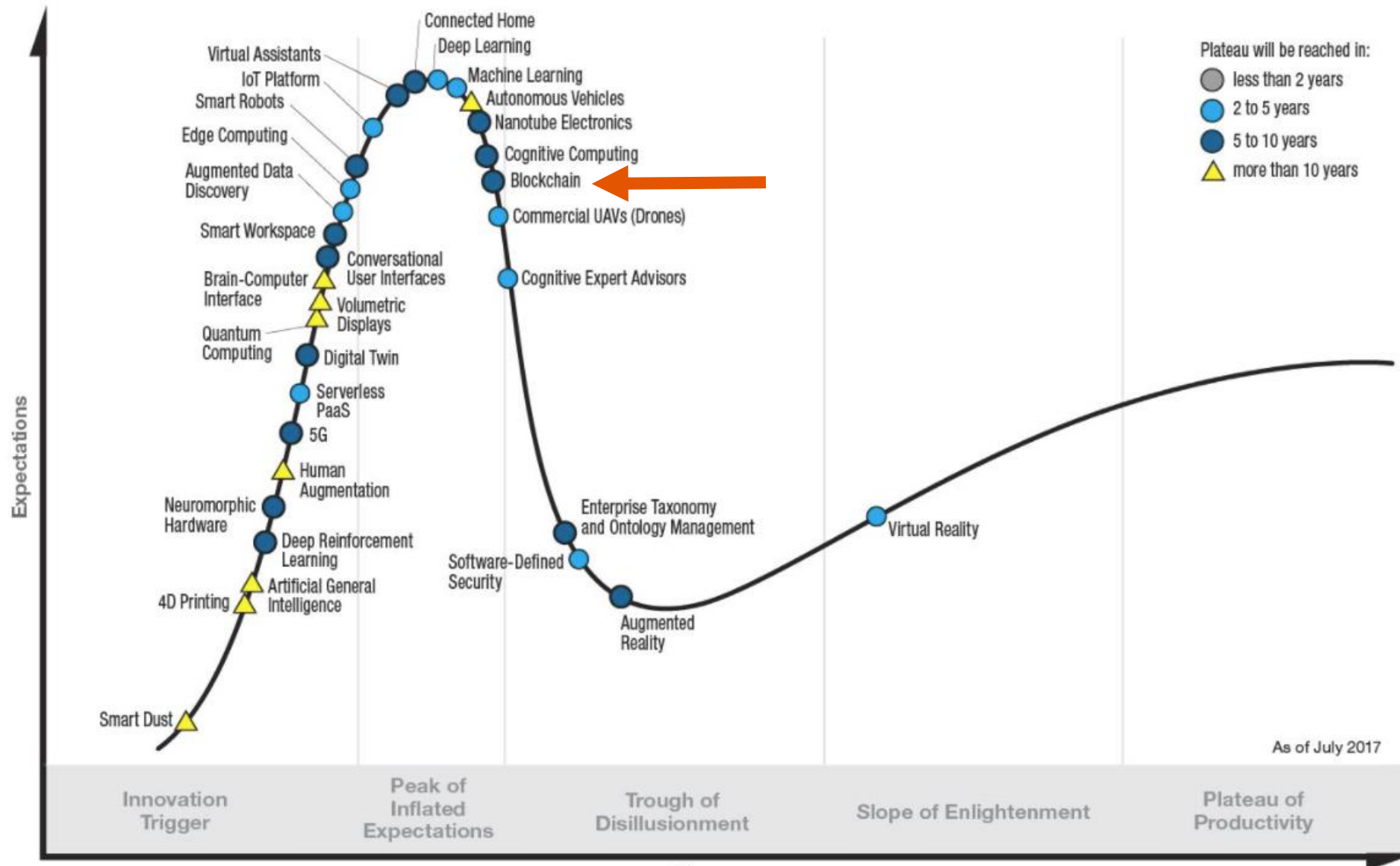
- A Transaction can be:
 - Alice sends \$100 to Bob
 - Charlie arrived at 10:23
 - Daniel is born on 22.04.1994

Each transaction
is signed by the
sender

Gartner Hype Cycle for Emerging Technologies – Aug'2016



Gartner Hype Cycle for Emerging Technologies, 2017



Amara's Law

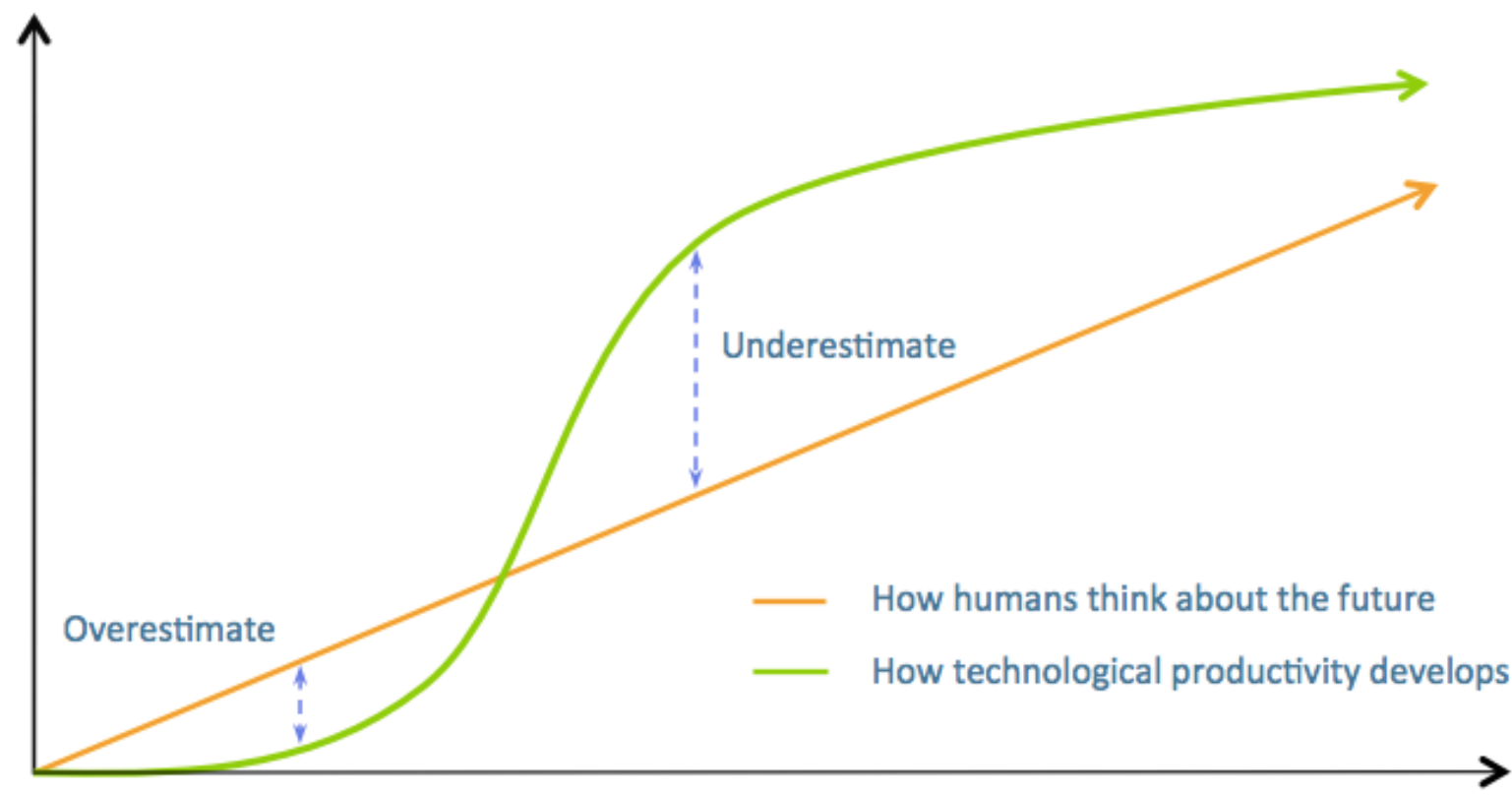
We tend to

overestimate the effect of a technology
in the **short run**

and

underestimate the effect in the **long run**

Amara's Law



Blockchain

“Could”

Change the World

As we Know it

What is the problem to be solved?

- **Your Corp's IT Department list of assets and owners**

Asset	In use by
Notebook 1	I01234
Notebook 2	I02344
Notebook3	I43333
Beamer	I04453
Telepresence	I12345

What is the problem to be solved?

- Sharing assets

Asset	In Use By	Owner
Notebook 1	I01234	A
3D Printer x	I02333	B
Notebook 2	I02344	A
Notebook 2	I43333	A
Beamer	B	A
Telepresence	B	A

Company A

Asset	In Use By	Owner
Notebook 3	S0344	B
3D Printer x	A	B
Beamer	S0123	A
Telepresence	S0122	A

Company B

What is the problem to be solved?

- Sharing assets – scale out

Asset	In Use By	Owner

Asset	In Use By	Owner

Asset	In Use By	Owner

Asset	In Use By	Owner

Asset	In Use By	Owner

Asset	In Use By	Owner

Asset	In Use By	Owner

What is the problem to be solved?

- **Sharing assets – Intermediation / Centralization**

Asset Manager
by Best_Of_Trust

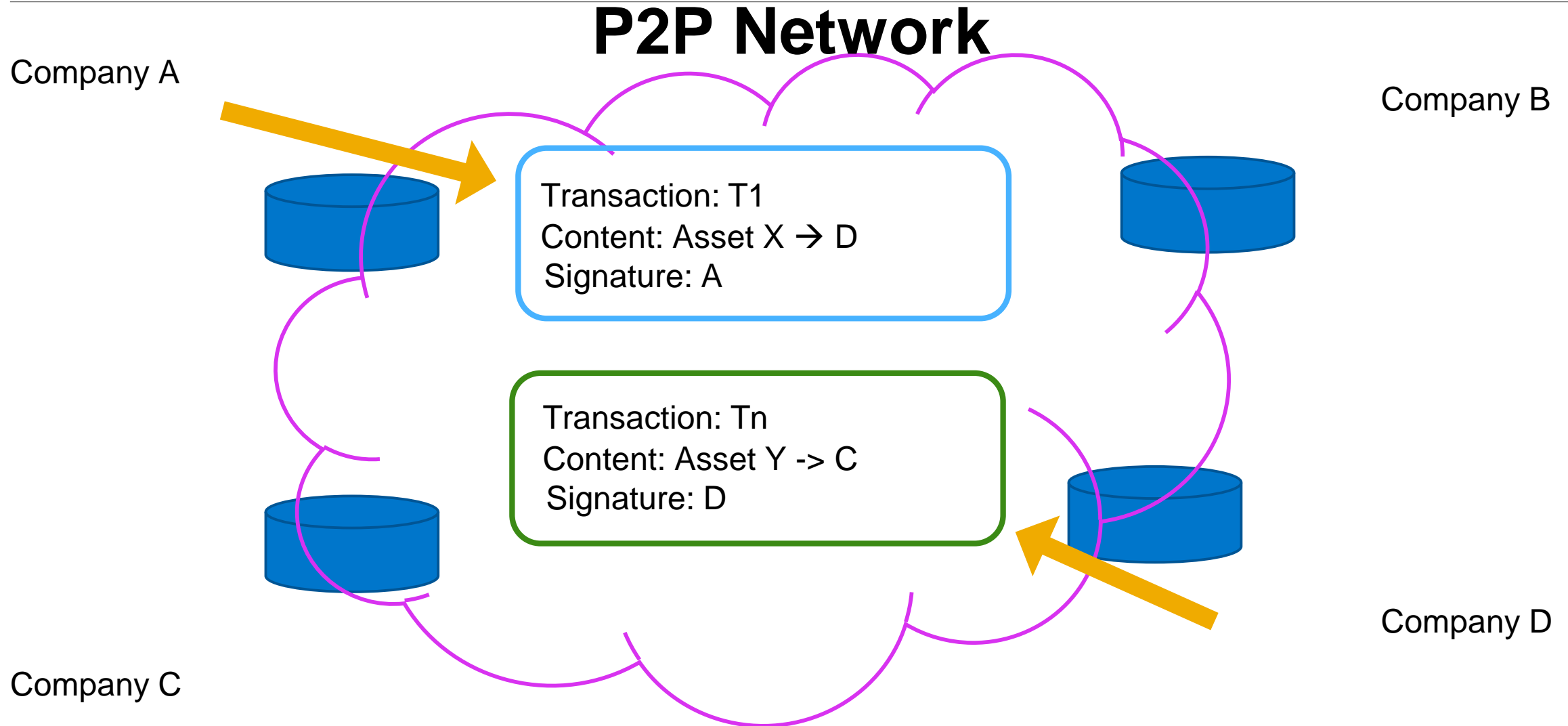
Asset	In Use By	Current Owner	Original Owner
Notebook 1	I01234	A	D
3D Printer x	S3444	A	D
Notebook 2	I02344	A	B
Notebook 2	B3244	B	C
Beamer	S3444	C	A
Telepresence	S2133	C	A

What is the problem to be solved?

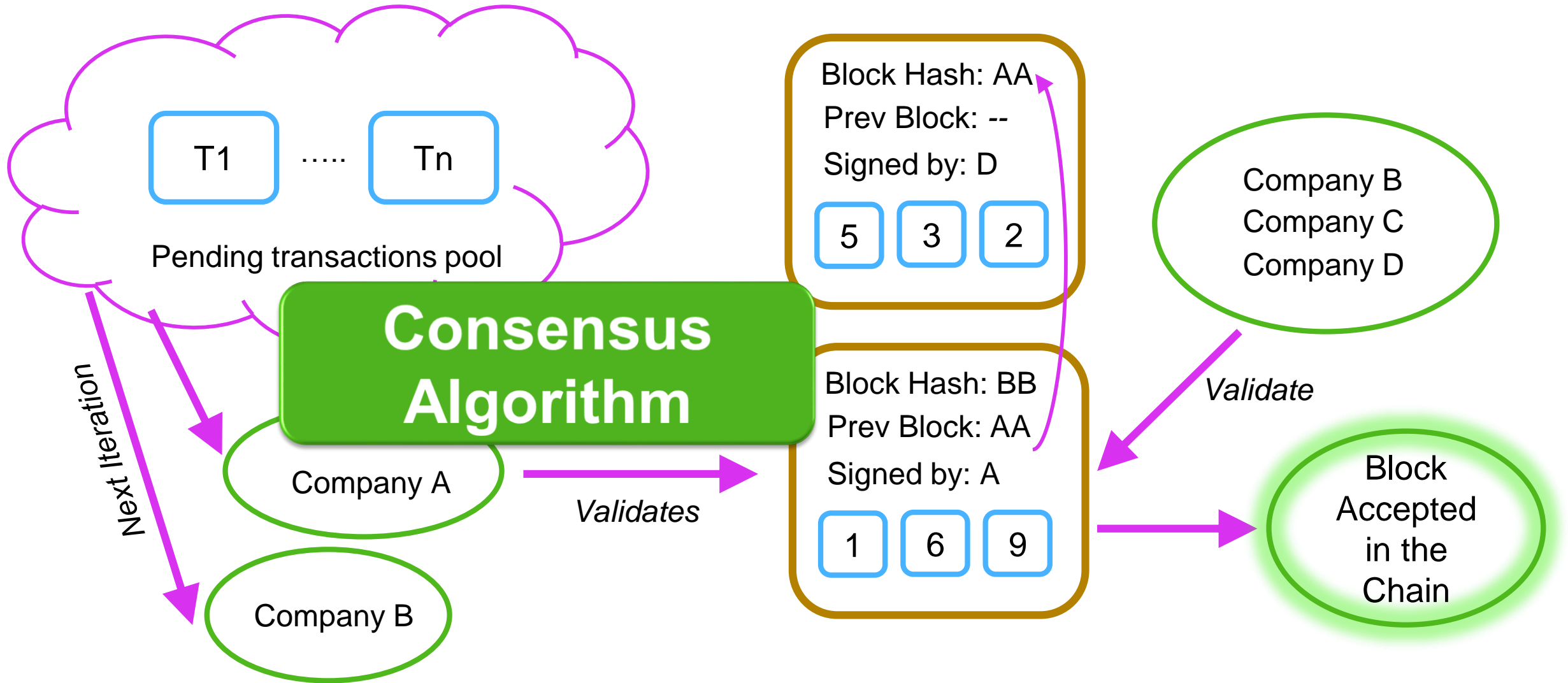
Asset Manager
by Best_Of_Trust

- **If data is centralized in Asset Manager**
 - *Honey Pot for hackers*
 - *Could skip/delete/add some entries on purpose or due to fraud*
 - *Ensure HA 99.99999%*
 - *Data Centers around the world, to ensure fast access*
 - *Operate Decentralized Database, synchronizing data from all Data Centers*
- ***All this drives costs up for participating companies***

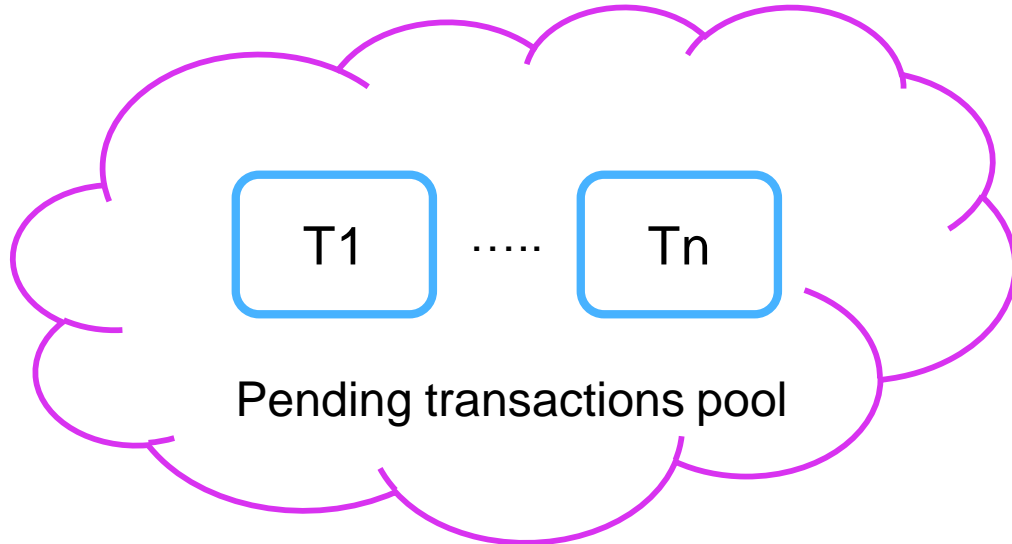
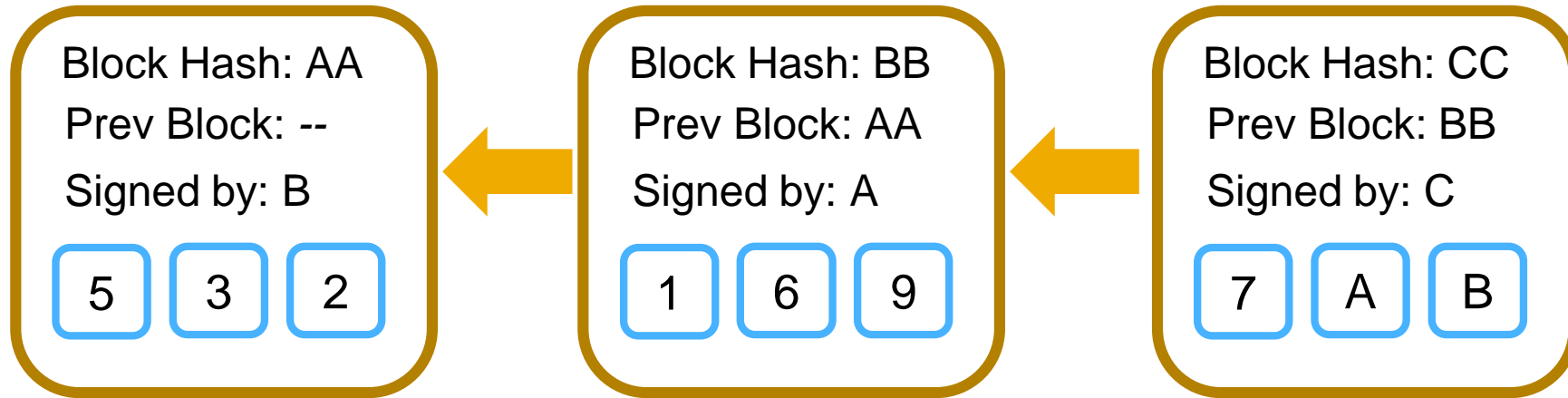
Blockchain to the rescue



Blockchain to the rescue



Blockchain to the rescue



- **Immutability**
 - Cannot delete and modify transactions
- **Inclusion**
 - No transactions are ignored

What else...

- **Cybercrime protection**

- If a company is breached and data stolen/encrypted → Blockchain has it all
- If some insider tries to tamper with data → All transactions and blocks are signed
- DDoS attacks are much more harder due to the distributed setup

- **Robustness**

- Out-of-the-box resilience, high-availability and disaster-recovery
- Including new nodes and datacenters is easy

What else...

- **Disintermediation / No 3rd Parties**
- No longer intermediaries are required to ensure and sell trust, between parties that do not trust each other completely
- **Transparency**
- Parties can agree to share some or all data -> no need to synchronize Databases
- Audits and Compliance checks are done directly

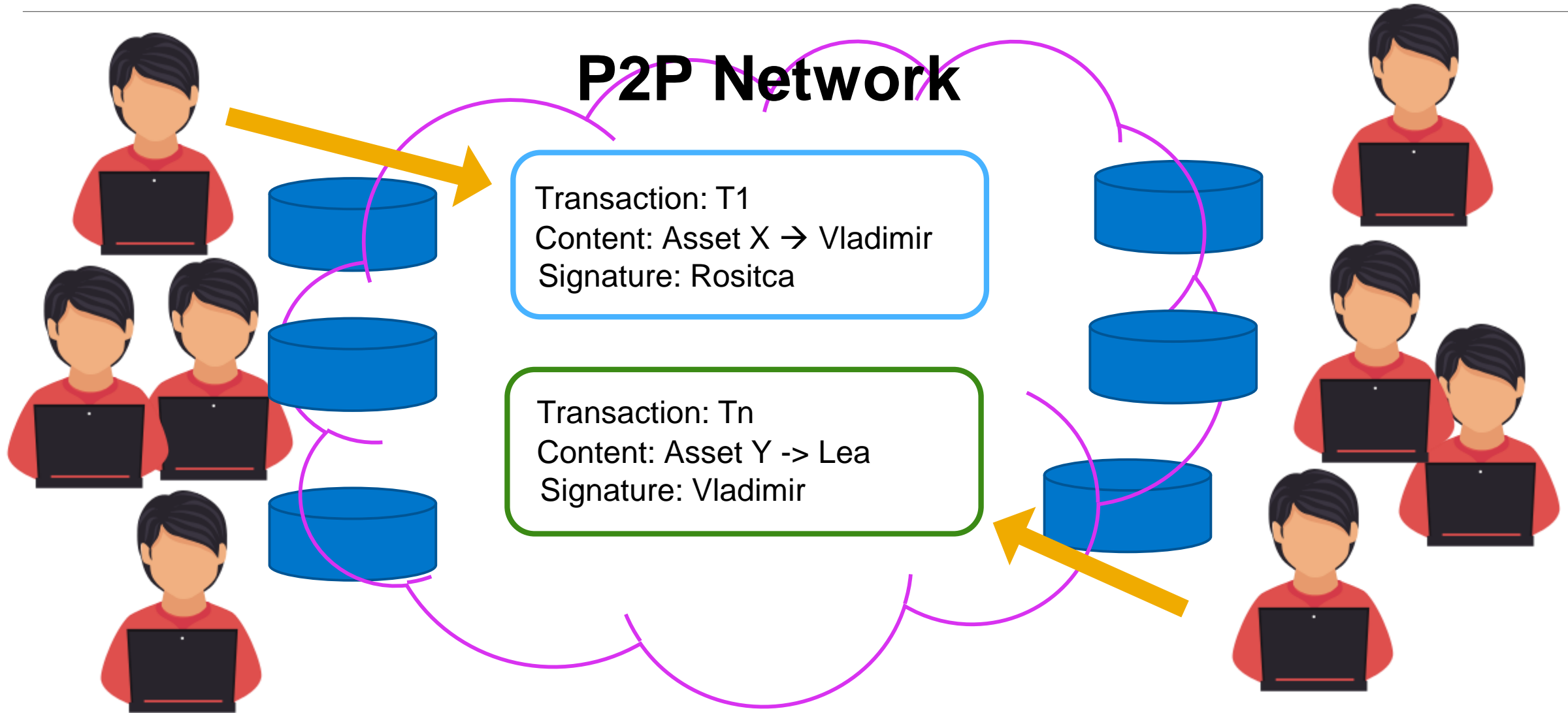


Usages

Private Blockchains

- **Optimize the exchange of assets between partnering companies**
- **Avoid 3rd Parties**
- **E.g. Car Manufacturers Blockchain, Airplanes, Hospitals, Banks**

Public Blockchains



Public Blockchains

- **Everybody can make transactions about their own resources**
- **Miners make sure rules are enforced**
 - **They are paid in the network's currency and thus – mine it**
- **Complex cryptography and consensus algorithms are used to ensure the blockchain is immutable and trusted**

Welcome, Internet of Value!

Many Blockchains

- **What do Different Blockchains Do?**
- **How Many are there?**

BLOCKCHAIN PROJECT ECOSYSTEM

CURRENCIES

BASE LAYER PROTOCOLS



PAYMENTS



DEVELOPER TOOLS

SMART CONTRACTS



SCALING



ORACLES



SECURITY



LEGAL



INTEROPERABILITY



PRIVACY



DAGs



SOVEREIGNTY

USER-CONTROLLED



GOVERNANCE



VPN



COMMUNICATION



IDENTITY



SECURITY



STABLECOINS



FINTECH

TRADING/DEX



INSURANCE



LENDING



FUNDS/INVESTMENT



VALUE EXCHANGE

CONTENT MONETIZATION



DATA



MARKETPLACES



SOCIAL



VIDEO



NON-FUNGIBLE

FILE STORAGE



COMPUTATION



MESH



ENERGY



FUNGIBLE



SHARED DATA

INTERNET OF THINGS



SUPPLY CHAIN/LOGISTICS



ATTRIBUTION



REPUTATION



CONTENT CURATION



AUTHENTICITY

DATA



TICKETING



OTHER

PREDICTION MARKETS



VIRTUAL REALITY



STAKING POOLS



GAMBLING



GAMING/ ESPORTS



**Distribute
EVERYTHING!**

compound

@JOSH_NUSSBAUM

Crypto Currencies and Assets

- **Cryptocurrency / Asset vs Blockchain**
 - Cryptocurrency is the native unit of a certain blockchain that enables it's services
 - For example
 - 1 token per ID Authentication
 - 2 tokens per 5 minutes of Video watching
 - 0.2 tokens for 1 gb data storage
 - 0.0001 tokens for a line of distributed computing execution
 - Etc...
- **Some of them can be purchased with Bitcoins, others via Normal money on exchanges. Or mined via CPU, GPU, Other (ASIC)**

Lot's of Noise and SCAMs

- **1000s cryptocurrencies with > \$230 billions total market cap (~20th place)**
- **All of them are in research / development phase right now**
- **Focus on different aspects:**
 - Privacy, Performance, Consensus Algorithms
 - Distributed version of any existing business now
 - Clone or Fork of an existing Blockchain project
 - Cryptocurrencies on top of other Cryptocurrencies
- **Main use case in 2016/2017 is Speculation due to FOMO (Fear Of Missing Out)**
 - Some cryptocurrencies prices rose by 10x within a month, others 100x within an year
 - Bitcoin: \$700 -> \$20000
 - Ethereum: \$10 → \$1200

Fundraising

- **Traditional fundraising**
 - Pitch against some Venture Capital firm in several rounds
 - Get 1, 10, 50 millions \$ per round based on sound results and hard work
 - Private investors are almost unable to join the party

AMATEURS 😊

Fundraising Blockchain Projects

- **Coin-based fundraising – ICO – Initial Coin Offer**
 - Invent a coin/token, e.g. VladiCoin
 - Tie it to some project, e.g. 1 VladiCoin = 1 mb of ultra/hyper fast virtual drinks
 - Pay for a nice Web Page (5000\$), write 10 pages White Paper
 - Sell 1,000,000,000 coins for 0.10\$ **(But in Bitcoin, to avoid regulation)**
 - Earn between \$1-100 millions (based on Twitter and media noise)
 - No delivery required
 - No regulation (Though some countries try to apply some)
 - 100+ ICOs per month

Government / Public Administration

- **E-Voting**

- Blockchain will ensure that the voices are counted properly
- Homomorphic encryption and Zero Knowledge Proofs will ensure privacy is kept

- **Public Auctions, etc**

- Reducing the number of intermediaries will make the more transparent

- **Land Registry**

- No longer required as Land Ownership will be recorded on the blockchain

- **Notaries**

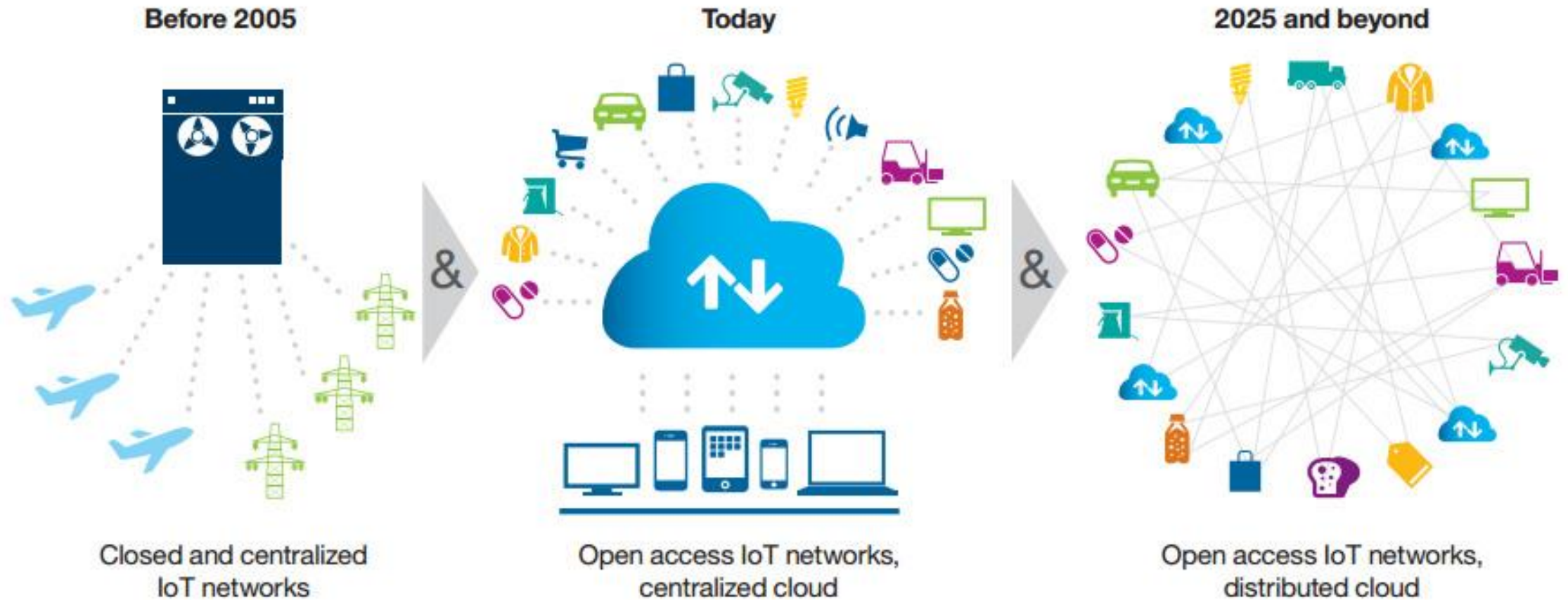
- Deprecated, once people and companies can transfer assets via the blockchain w/o mutually trusting each other

- **GovTech**

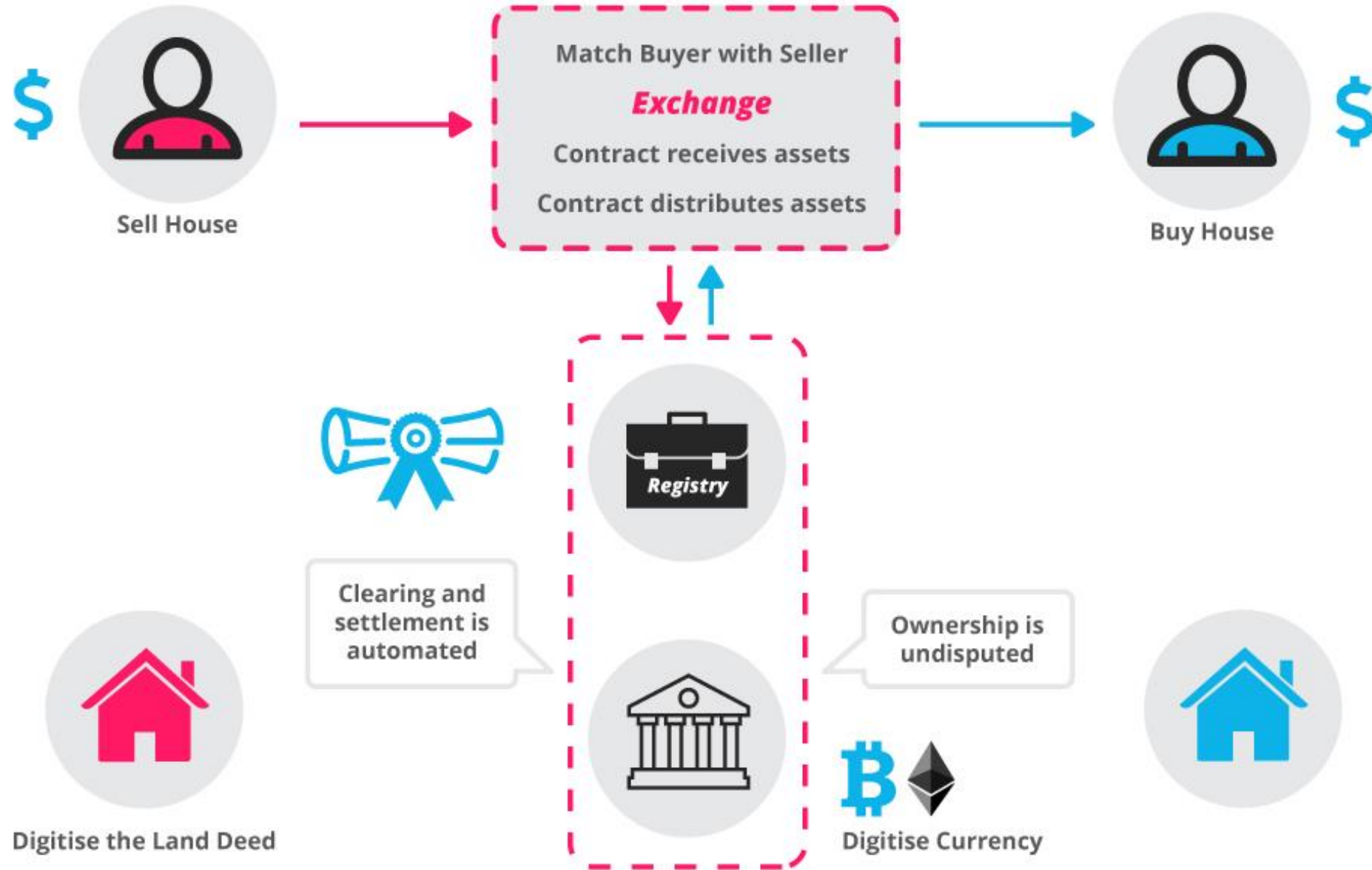
Finance

- **Part of bigger FinTech movement.**
 - Banks are afraid that if they do not innovate, others will
- **One of the few industries, not disrupted by Internet yet**
- **Many intermediaries involved**
 - Lots of them subject to cybercrime
- **Lot's of paperwork to synchronize ledgers due to missing trust and regulation requirements, audits, etc..**
- **Lot's of inefficiencies and room for errors, bribery and fraud**
- **Transferring electronic money between 2 accounts taking couple of days**
- **All this at the expense of the customers**

- **→ Finance is currently heading to blockchain revolution at full speed**



How Smart Contracts works





Closing Words

The price of Trust?

- **In LEAN Terms: Earning Trust is Waste, but you can't do business without it**
- **Today, we buy Trust from intermediaries, so we can exchange assets securely**
- **Blockchain technology, allows us to digitize Trust and make it productive**

Words of Caution

- **The technology is in a massive hype state**
- **It will take some years until hype and reality are split**
- **Experts claim, that Blockchain can be compared to Internet as of late 90s**
- **Lots of Hype**
- **DotCom balloon**
- **Most probably the Google, Facebook and Ebay of Blockchain are lurking in some university**
- **Yet, the coming years will be very interesting, lot's of new companies will rise, lot's will fail**

Future is bright

- **For the economics in the developed countries – this has to potential to improve processes and decrease bureaucracy**
- **For economics in countries with corrupt governments – this would increase peer-pressure, which could lead to improved results**
- **For the developing world – blockchain could help to improve work conditions, bring people closer to wealth creation**

Imagine (Dream or Fantasy)

- **Blockchain enables a world (aka Utopia) where**
- Money earned by **doing labor** can be spent digitally and **privately**
- Money collected **by the government** (or “paid by us to the government to make us live better”), can be **publicly traced** from the collection point, through the distribution via Smart Contracts, and finally to the actual spending in Hospitals, Roads, Schools, Agriculture
- Politicians are **tied via** Smart Contracts to their commitments and **delivery of value**

Thank you!
Questions?