# DLT Development Platforms Comparison

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April 2019

- Director of the Certificate of Advanced Studies in blockchain development at University of Geneva (12 European credits, ECTS)
  - https://www.cas-blockchain-certification.com

- President of Reputaction
  - Patent-pending hardened crypto wallet for KYC-AML-enforced Bitcoin/tokens transactions, even offline

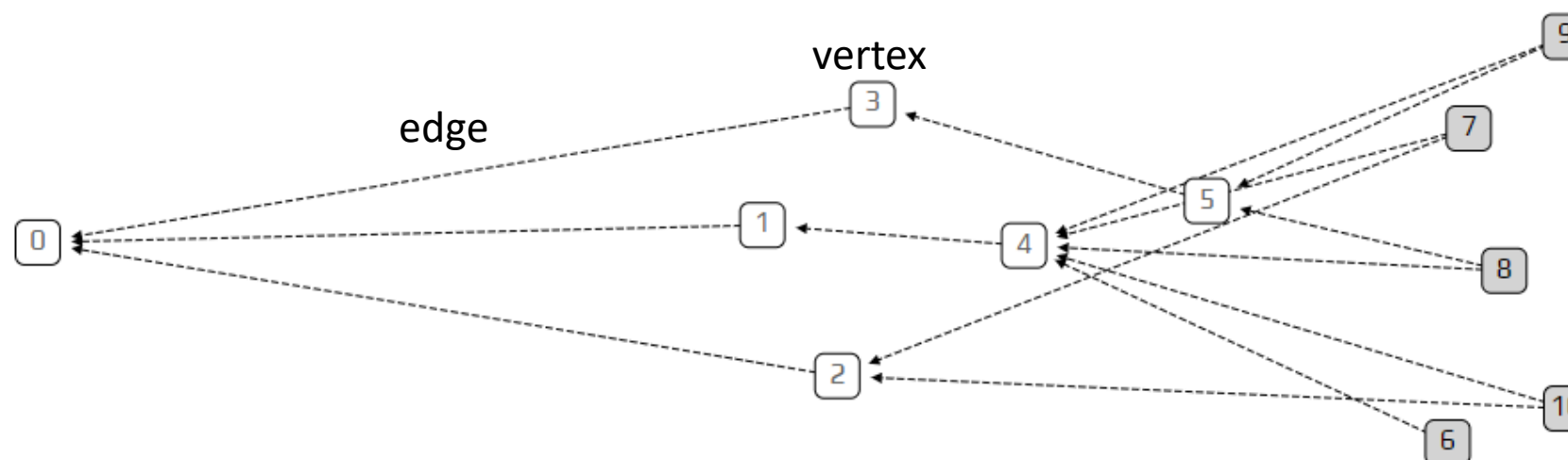- Google Award of Excellent Research in Academia in 2016
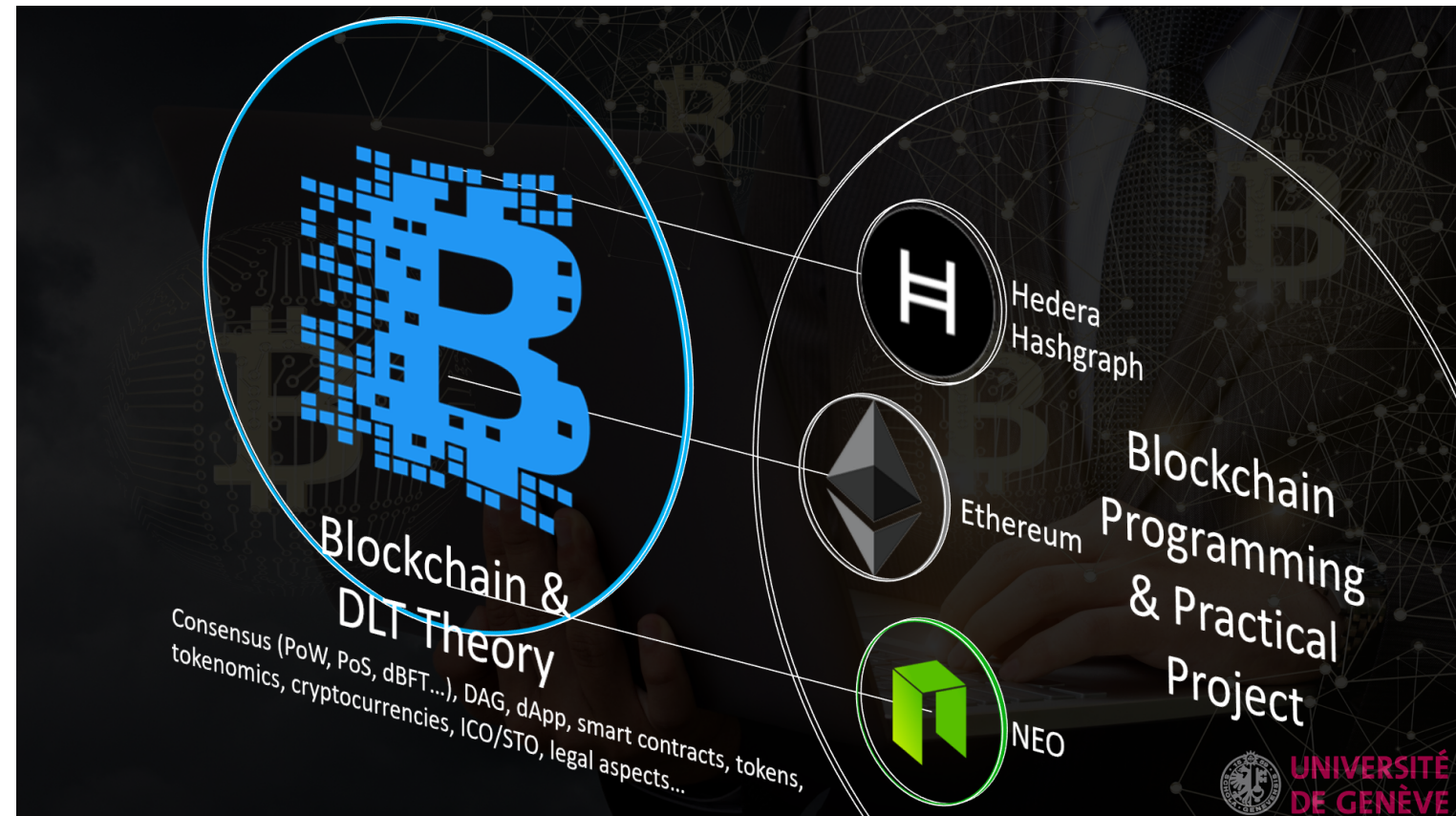
Non-financial use-cases of blockchains
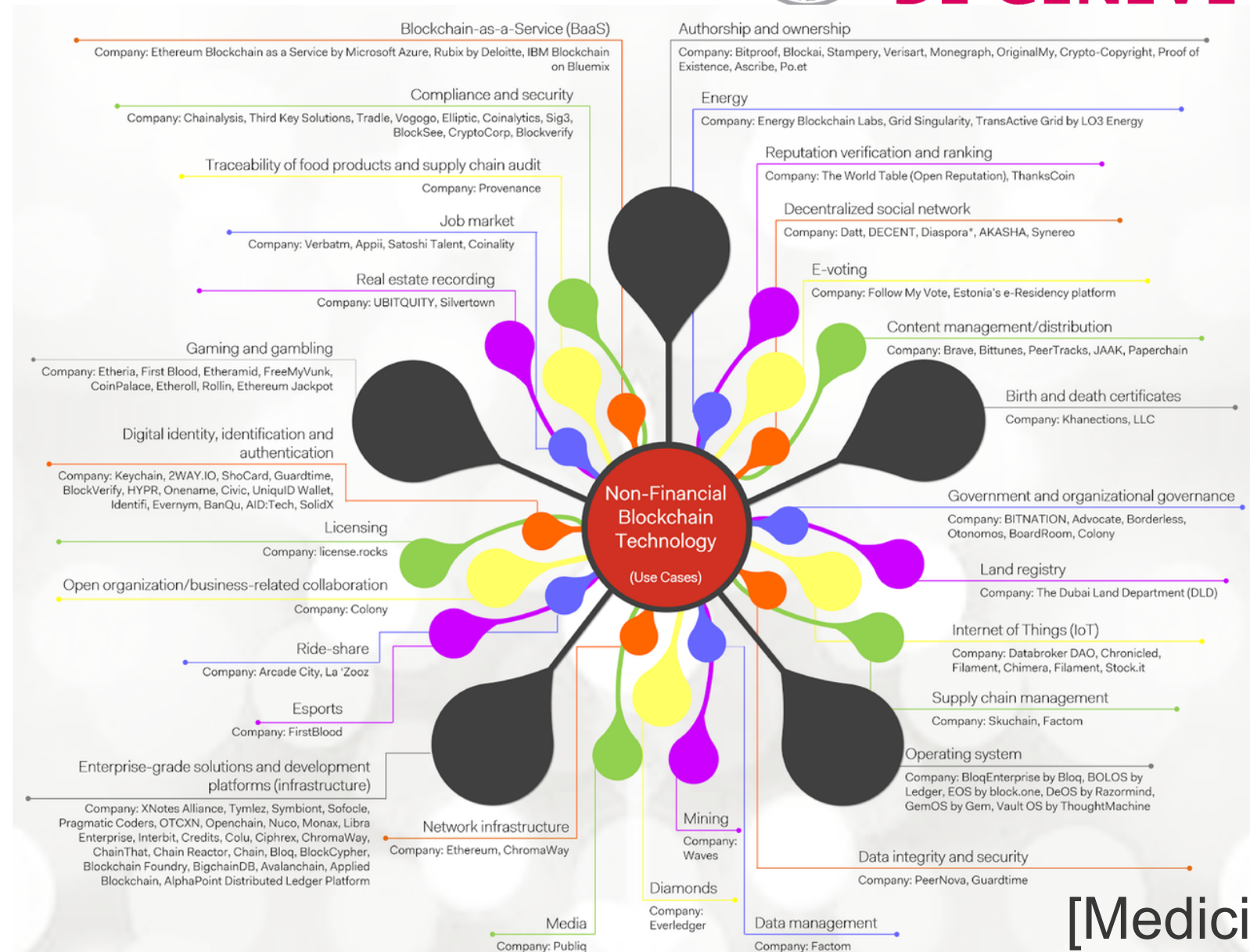
Directed Acyclic Graph (DAG)

- Blockchains are only a subset of Distributed Ledger Technologies (DLT).

- Another type of DLT are solutions relying on DAG rather than blockchain: IOTA, Hashgraph…


[Vaibhav Saini]

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Decentralized Applications (dApp) Requirements

- Different DLT platforms have different advantages and disadvantages for dApp development and production:
  - Peer-reviewed
  - Transaction per seconds (TPS)
  - Attack-resistance
  - Turing completeness
  - Safety or liveness
  - Final or probabilistic
  - Permissioned or permissionless
  - Programmability
  - Popularity
  - Sustainability
  - Interoperability
  - Privacy and legal aspects
- However, the first requirement to check is to know whether a DLT is needed or not!

How to decide if you need a DLT?

[Wüst and Gervais]	Permissionless Blockchain	Permissioned Blockchain	Central Database
Throughput	Low	High	Very High
Latency	Slow	Medium	Fast
Number of readers	High	High	High
Number of writers	High	Low	High
Number of untrusted writers	High	Low	0
Consensus mechanism	Mainly PoW, some PoS	BFT protocols (e.g. PBFT [5])	None
Centrally managed	No	Yes	Yes

Do I need a blockchain?

No.
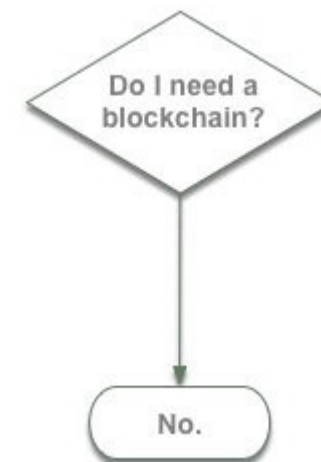
[Birch]

US DHS DLT Decision Flow Chart
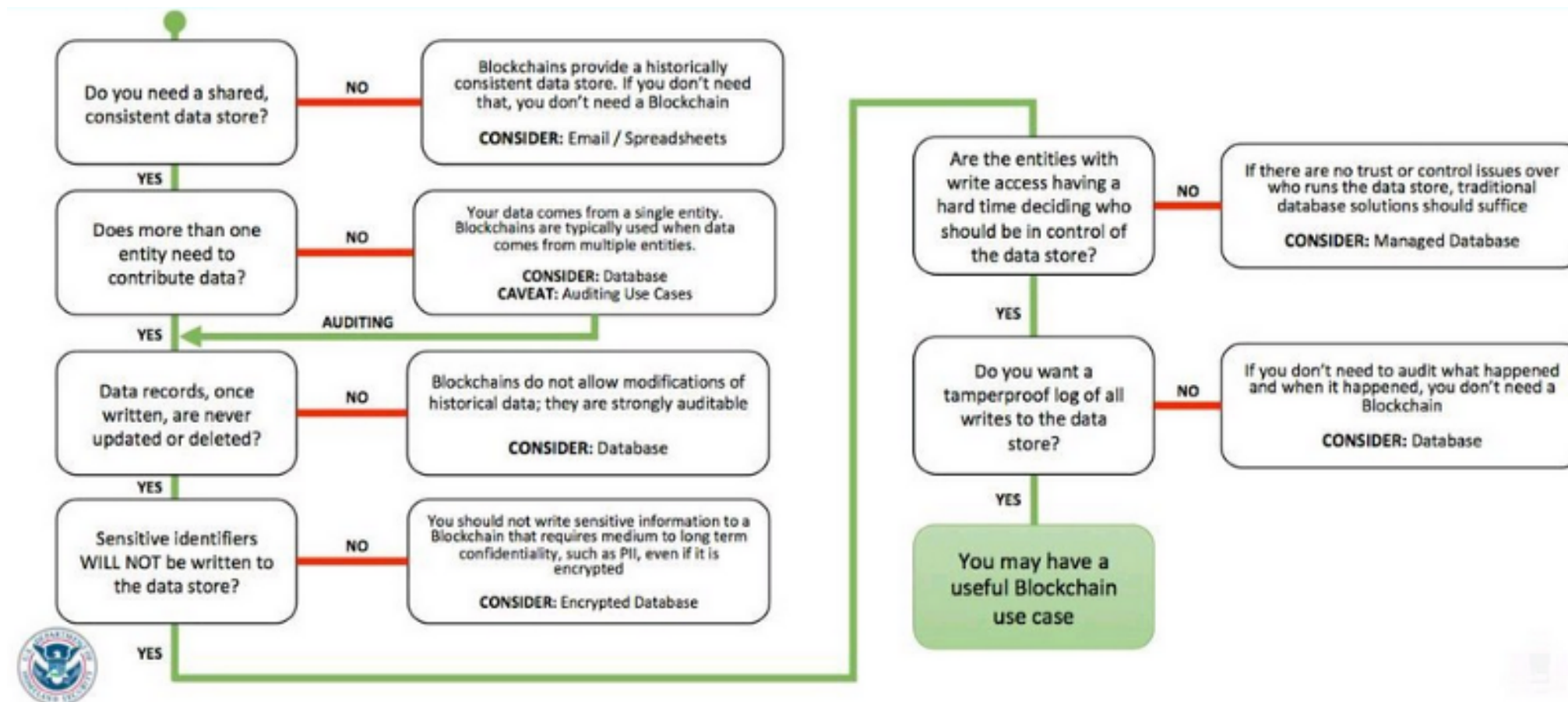
	Foundation	Partners	Code	Consensus	Transaction Speed (without layer 2)	Attack Resistance	Current Decentralization	Team Size	Token Generation	Legal Aspects	Current Growth Potential
Ethereum	Switzerland	World	Difficult (Solidity)	PoW, try PoS	25	Yes if PoW, no if PoS	Good	Large	Proven	No KYC	High
Hashgraph (Hedera)	USA	Swirlds	Medium (Java, Solidity)	Gossip of gossip	100 000	Yes if permission-based, No if permissionless	Tied to Swirlds	Medium	Not a current objective	KYC + AML + SAFT regulated	Medium
NEO	China	China / OnChain	Easy (C#, Java…)	dBFT	1000	To be confirmed	Tied to China / OnChain	Medium	Proven	No KYC	Medium
ICON	Switzerland	South Korea / LoopChain	Easy (Python)	LFT	Better than Ethereum	To be confirmed	Tied to South Korea / LoopChain	Medium	To be confirmed	KYC & AML	Low
Cardano	Switzerland	Japan	Difficult (Haskell)	PoS (Ouroboros, formally proven)	To be confirmed	Formally proven	Medium	Medium	Not yet ready	KYC	Medium
Tezos	Switzerland	US/France …	Difficult (Michelson)	DPoS (staking, governance)	40	Formal verification friendly	Good	Medium	Not a current objective	KYC & AML	Medium

Programmability

- The following questions may be asked when selecting a DLT:
    - Does the DLT uses a well-known programming level with high-level bug and security checks?
    - Does the DLT provides an Integrated Development Environment (IDE)?
    - How big is the developers community?
    - Are all the DLT components open-source?
    - Are there any restricting patents?
    - How does the governance work?
    - Does the DLT use peer-reviewed cryptography?
    - How many other projects/dApp have successfully used the DLT?
    - How many projects/dApps built with the DLT have been successfully attacked due to bugs or security holes?
    - Does the DLT have a testnet separated from the mainnet?
        - Is it easy to use the testnet?
    - Does the DLT have a detailed blocks/transactions explorer?
    - Does the DLT provide an open-source wallet?
    - Is it possible to create privatenets for testing purposes?
    - Does the DLT have an emulator?
    - Does the DLT have an active open-source repository?
        - Including a test suite (unit tests…)?
        - Including active bugs treatments?
        - Including detailed documentation, at least in English?
        - Including tested templates, e.g., ICO smart contracts or tokens generation templates (ERC20, NEP-5…)?

Thanks for your attention!

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