## Distributed Ledger Technology: analysis of the technology and design of a prototypical solution



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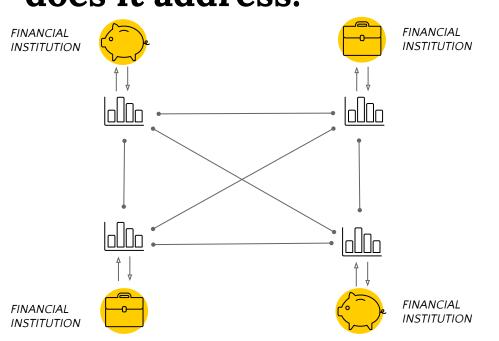
**Academic Year:** 2017 - 2018



#### **Project Work outline:**

- Study of the technology: development history, state of the art, taxonomic analysis
- Business opportunity research: how is the industry currently shaped, what space can a company fill
- Comparative analysis of three DLT platforms
- Prototype design and implementation

## What is the technology and what does it address:



#### Trust establishment

Cryptographically addresses the problem of shared trust, no need for trusted intermediaries

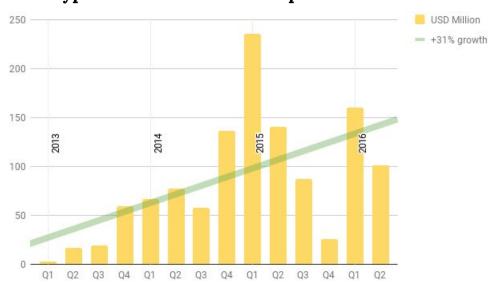
#### Reconciliation of data between different entities

The distributed ledger is the single source of truth, improves data consistency

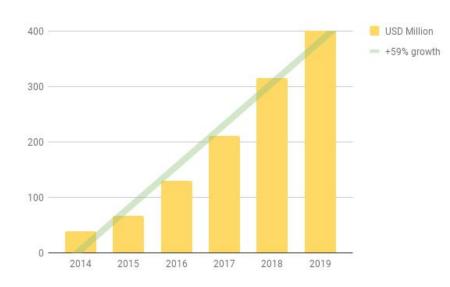
#### Latency, transparency, security

Reduced transaction and integration costs, lower settlement delays, near real-time transactions, added layers of security guaranteed by the architecture

### Investments in blockchain and cryptoassets-related startups



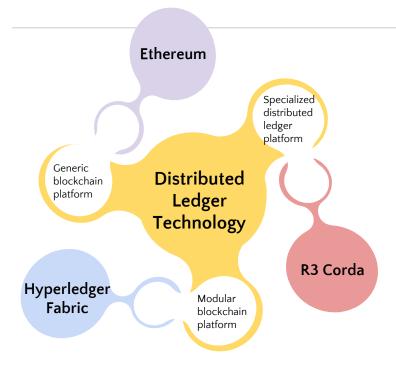
### Estimated capital venture investments in DLT applications

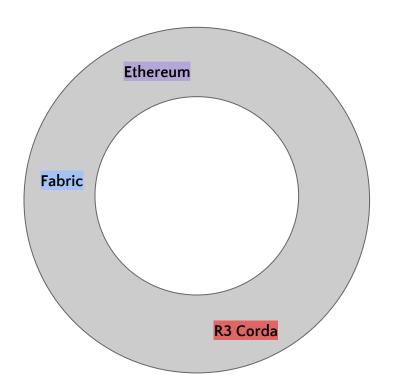




#### **Comparative Analysis**

	Ethereum	R3 Corda	Hyperledger Fabric
Operation mode	Permissionless, private or public	Permissioned, private	Permissioned, private
Consensus	Mining-based, PoW, soon to be PoS	Pluggable consensus, multiple approaches allowed	Pluggable consensus, specific approach (notary node)
Smart contracts	Solidity	Kotlin, Java, smart contracts with legal validity built on top (legal prose)	Go, Java



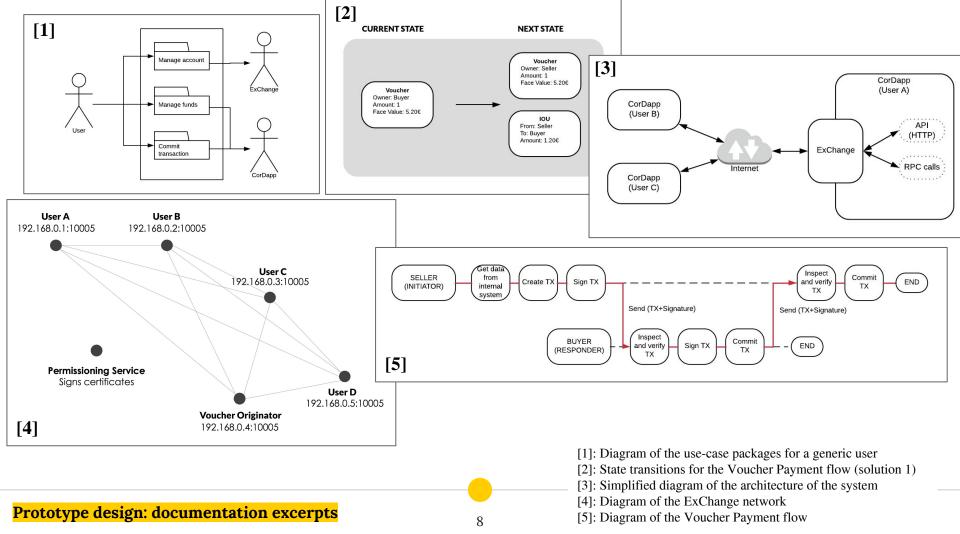


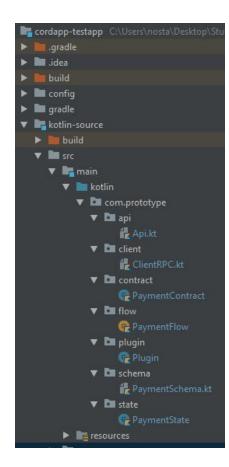
	Ethereum	R3 Corda	Hyperledger Fabric
Trust and data immutability	Ledger-level consensus	Transaction-level consensus	Transaction-level consensus
Data processing speed and throughput	Low	High	High
Data coordination	Mostly predetermined by the platform, less control given to the developer	Programmable communication flows	Extensible data coordination toolset



#### Prototype design and implementation

- Scope: R3 Corda viability test, know-how establishment, templating
- Requirements: Payment platform (called ExChange) accepting and managing fixed-value credits (meal vouchers)
- Expected results: ease of implementation of financial use-cases, frictionless and seamless transactions, automatization of the management of records between parties





Listening for transport dt\_socket at address: 5010 Jolokia: Agent started with URL http://127.0.0.1:7010/jolokia/ Corda Open Source 3,2-corda (5ae8325) Logs can be found in : /home/nassim/projects/cordapp-source/kotlin-source/build/nodes/PartyB/logs Database connection url is jdbc;h2;tcp://127.0.1.1:46771/node Advertised P2P messaging addresses : localhost:10010 RPC connection address : localhost:10011 RPC admin connection address : localhost:10051 : corda-finance-3.2-corda, cordapp-source-0.1, corda-core-3.2-corda Loaded CorDapps Node for "PartyB" started up and registered in 65.09 sec

[2]

[1]

[2]: Terminal of one of the CorDapp nodes in the ExChange network

#### **Conclusions**

The technology hasn't reached maturity yet, but it's currently in a phase of fast evolution, standardization and regulamentarization of its ecosystem.

Research has shown that some major market players have been reacting strongly, albeit slowly, to distributed ledger technology.

Companies have a large space and high prospective gains in engaging with the ecosystem and trying to gain a strong position.

The prototype has shown proof of some of the benefits in building a distributed ledger specialized in financial use-cases with R3 Corda, and established a solid foundation for future developments.

# Thanks for listening

- Thesis repository: <a href="https://gitlab.com/dodicin/bachelor-thesis">https://gitlab.com/dodicin/bachelor-thesis</a>
- Statistics from slide 4 extrapolated from:
  - Keith Hale, Sern Tham. A Turning Point for the Global Asset Management Industry The Multifonds Every Fund Survey 2017.
  - Evangelos Benos, Rodney Garratt, Pedro Gurrola-Perez. The Economics of Distributed Ledger Technology for Securities Settlement. 2017
  - McKinsey&Company Blockchain Technology in the Insurance Sector, Jan 2017