



Paolo Caniccio

A Blockchain solution  
for European SMEs



# IFTA 2017 - Milan

## A Blockchain solution for European SMEs

Paolo Caniccio  
London Stock Exchange Group



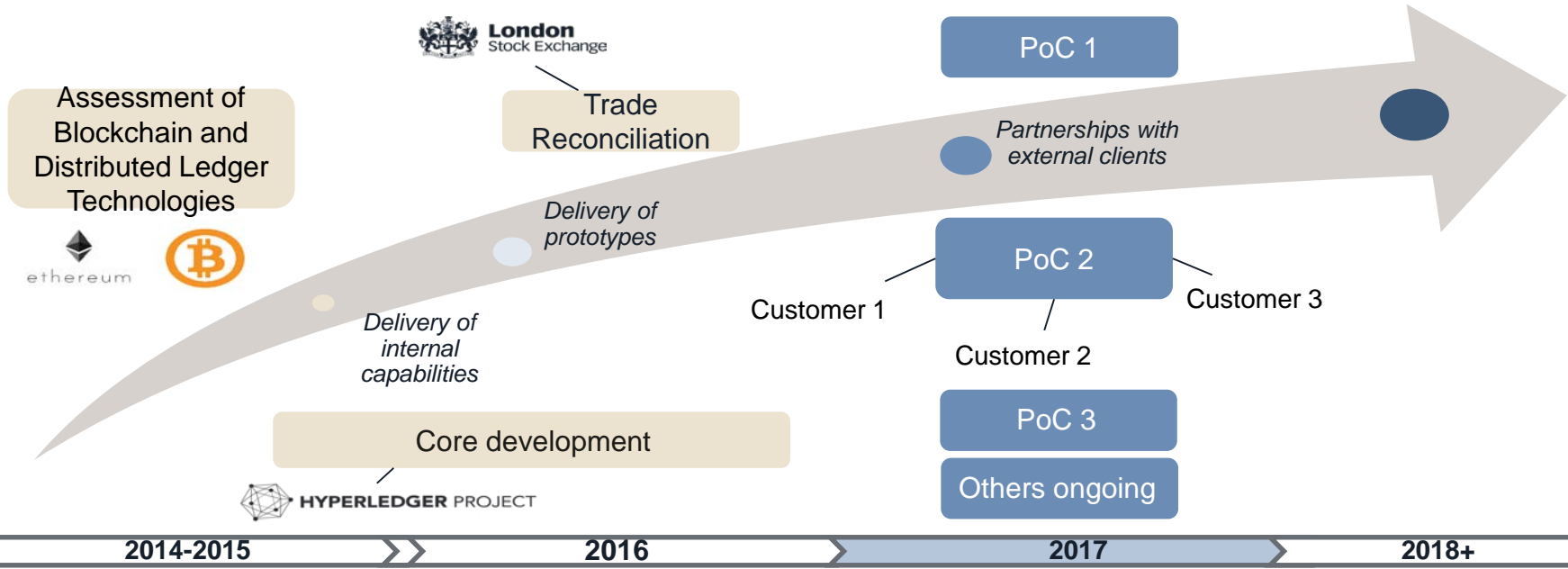
# Three years ago...



# ... we began to discuss ...



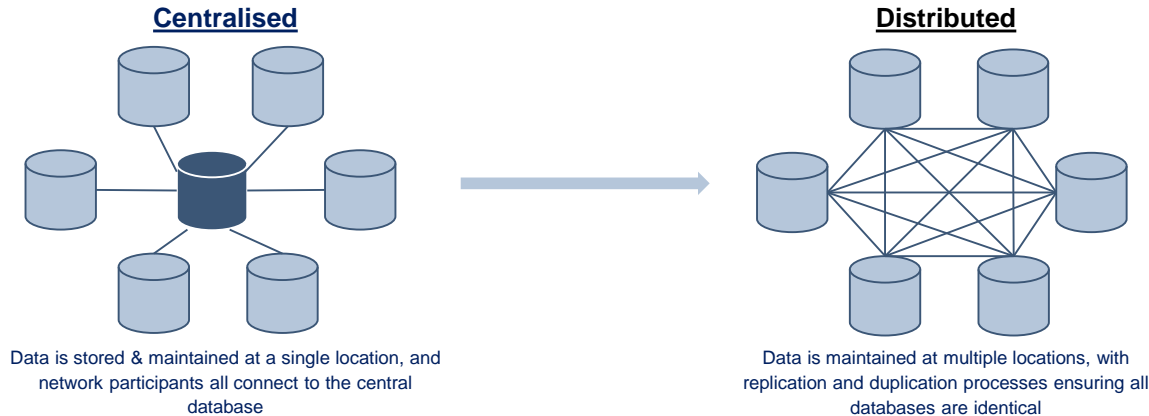
# ... to design a Distributed Ledger strategy



# What is a Blockchain?

A decentralised distributed ledger providing immutable exchange of value, with verification based on mutual consensus, securely backed by cryptography

- ✓ Blockchain takes the shape of a **chain of transactions** which is agreed by a selected group of participants
- ✓ This ledger is recorded in a **replicated and distributed** manner
- ✓ Is unfeasibly **difficult to alter** (cryptographic techniques to maintain integrity and assert rights)

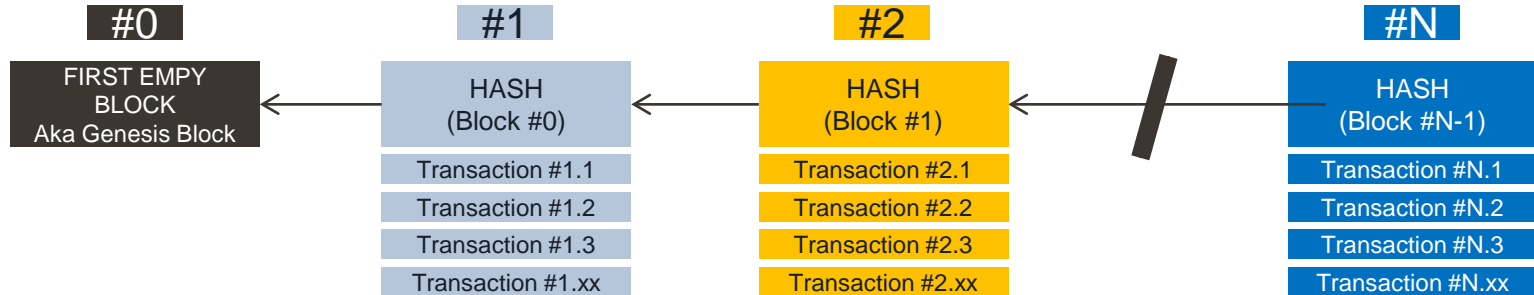


# What is a Blockchain?

- ✓ Blockchain is a **shared ledger distributed** throughout several nodes belonging to the same or different entities.
- ✓ All nodes share the same need to **be continuously aligned** on the same information content.
- ✓ The ledger grows over time by adding transactions, only in case **all nodes agree** that they are applicable, well formed and authorized.
- ✓ Blockchain nodes use a **consensus algorithm** to agree on block composition and “**smart contracts**” or “**chain code**” that provides logics for transactions’ validation.
- ✓ Each node, by **locally executing transactions**, evolves its informational knowledge – “local world state” -.
- ✓ Data alignment and consistency of the “world state” is ensured because all nodes **execute the same transactions** with the same order, applying the same algorithms.

# What is a Blockchain?

- ✓ Transactions are **stored in logical block**: each block has a reference to the previous one → CHAIN of BLOCKS → BLOCK CHAIN.



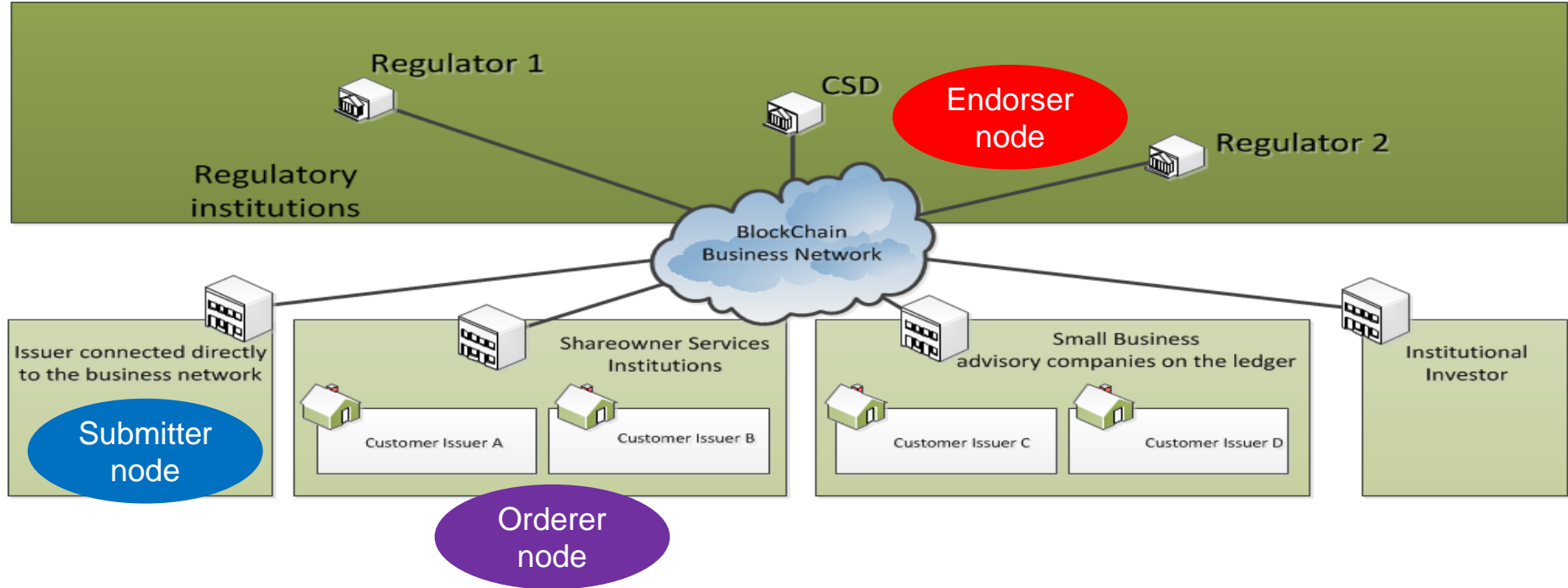
- ✓ A Blockchain is an immutable list of log where each element is **cryptographically** tied to previous elements.
- ✓ Log can be **distributed to multiple locations** to build a distributed logic, which can be updated *without* a central authority.
- ✓ The resulting application is a **distributed ledger**.



# A Blockchain solution for SMEs: Rationales

- ✓ Majority of shareholders of not listed Italian issuers **hold certificates in physical form**
- ✓ Certificates in physical form are **usually safe-kept** in a vault
- ✓ Holding certificates in physical form presents the following issues:
  - **End-to-end management of corporate actions** (voluntary and mandatory), and distributions
  - **Physical endorsement** in case of change of beneficial ownership
  - **Physical registration** of pledges on certificates
  - Management of **shareholders meeting**
  - **Costs of management** of certificates very high.

# A Blockchain solution for SMEs: Network



# A Blockchain solution for SMEs: Scalability and Privacy

Scalability of the private chain can be improved  
by means of a hierarchical node structure:

## Submitter Node Layer

Creates transaction proposals to be sent to the endorser layer. Executes transactions once the block are generated by Ordered layer

## Endorser Node Layer

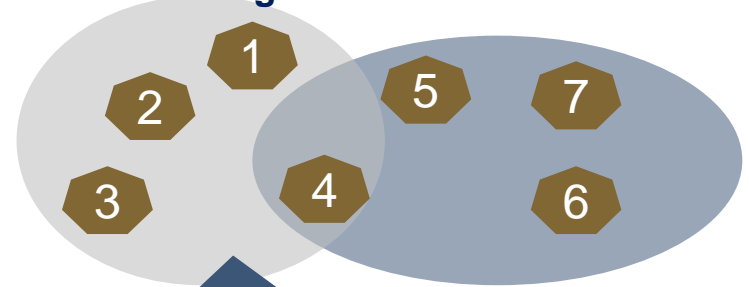
Receives proposal of transactions and validates them adding a digital signature on transaction consistency check. Executes transactions once the block are generated by Ordered layer

## Orderer Node Layer

receives approved transactions and creates the blocks. This layer is transaction content agnostic

These 2 layers share the ledger

Privacy of transactions can be achieved by  
means of logical information channels.



Information shared between nodes in channel 1 is not shared to nodes in channel 2. Nodes can belong to more than 1 channel

# A Blockchain solution for SMEs: Scope & Goals

## SCOPE

Scope is to set-up a business network on a **Hyperledger Blockchain** implementation to prove that technology is fit for purpose and capable of supporting the business requirements:

- Certificates in physical form shall be turned into **digital assets** held on a CSD system, in accordance with the current legal requirements for the «de-materialization» of assets.
- Shared ledger shall allow **advanced functionalities** for business participants to the ledger.

## TECHNICAL GOALS

- **Data segregation** is efficient and allows for proper granularity on «who can see/act what»
- **Security issuing** can be achieved in a user friendly yet robust and audit proof process
- Technology can provide **real time shareholding information** to issuers and regulators
- Securities transfers to update shareholding composition can **interact with legacy systems**.

# A Blockchain solution for SMEs: Scope & Goals

## SCOPE

Scope is to set-up a business network on a **Hyperledger Blockchain** implementation to prove that technology is fit for purpose and capable of supporting the business requirements:

- Certificates in physical form shall be turned into **digital assets** held on a CSD system, in accordance with the current legal requirements for the «de-materialization» of assets.
- Shared ledger shall allow **advanced functionalities** for business participants to the ledger.

## BUSINESS GOALS

- A **straight-forward** and **cost efficient** way to digitize assets
- **Automatic update** of the Shareholders Identification Book
- Opportunity to **leverage** the same business network to sell/buy digitized assets
- Capability to increase the potential channels to **raise funds** within the business network



# A Blockchain solution for SMEs

- Allow and ISIN issuer to be continuously aware of the list of ISIN share holders

Securities overview > **Shareholder overview** Last updated 01 March 2017 - 21:49

Account Superdriolica S.P.A. Account ID A846HD Opening date 24/04/2006

**Shareholder Overview** Active since 02 March 2017  
Below you find a shareholder overview.

**Security Information**

|                |                    |
|----------------|--------------------|
| ISIN           | IT3456789012       |
| Title          | Superdialica Pumps |
| Symbol         | SPD                |
| Type           | Stock              |
| Market Segment | Open Market        |

Issued **10,000** Balance **8,300**

| Acquisition date | Account ID | Beneficiary Owner | VAT/INN          | Quantity |
|------------------|------------|-------------------|------------------|----------|
| Today            | A846GB     | Mario da Rossa    | RSSMRA60C12F205D | 300      |
| Yesterday        | A646HD     | SIA Srl           | 9225000969       | 800      |
| 14-03-2017       | A646HG     | Marta Bianchi     | BNCMRT72M46H501D | 500      |
| 02-03-2017       | A646AB     | Luca Sechi        | SCHLCU76R09A794Y | 100      |

# A Blockchain solution for SMEs: Scope & Goals

## SCOPE

Scope is to set-up a business network on a **Hyperledger Blockchain** implementation to prove that technology is fit for purpose and capable of supporting the business requirements:

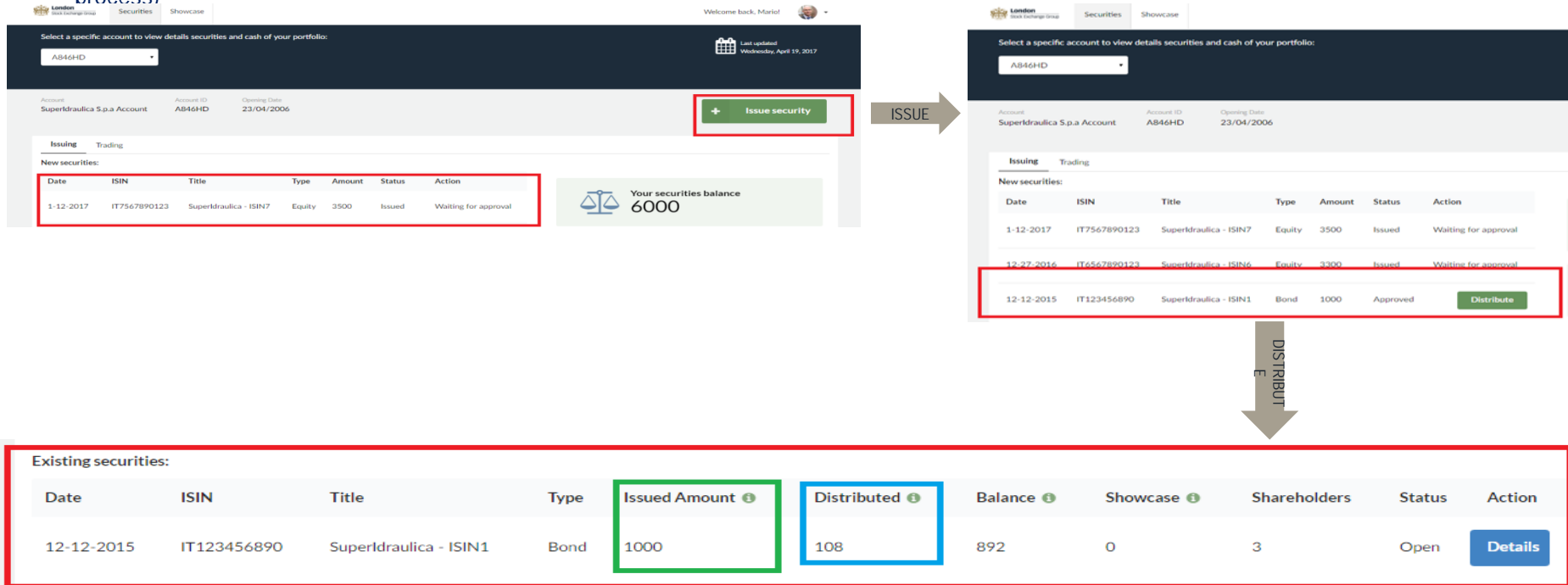
- Certificates in physical form shall be turned into **digital assets** held on a CSD system, in accordance with the current legal requirements for the «de-materialization» of assets.
- Shared ledger shall allow **advanced functionalities** for business participants to the ledger.

## BUSINESS GOALS

- A **straight-forward** and **cost efficient** way to digitize assets
- **Automatic update** of the Shareholders Identification Book
- Opportunity to **leverage** the same business network to sell/buy digitized assets
- Capability to increase the potential channels to **raise funds** within the business network

# A Blockchain solution for SMEs

- Allow a DLT participant issuer to request CSD approval for deploying a new ISIN in the PoC ledger.
- Initially book the total amount of the newly issued ISIN on the issuer own account for subsequent initial distribution to share holders (private placement process)

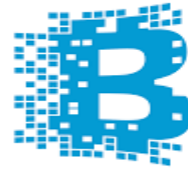






# Blockchain: a disruptive technology

 **Blockchain**  
A disruptive technology  
with the power to revolutionize  
financial services



**BLOCKCHAIN**



Blockchain Technology - The  
Next Disruptive Computing  
Innovation

A photograph of several gold Bitcoin coins. Some are stacked on top of each other, while others are scattered around. The background is dark, making the gold coins stand out.

Disruption  
Ahead

A green rectangular sign with white text on a wooden post. The sign is tilted slightly to the right. The background is a blue sky with white clouds.

# Blockchain: a Tech-Business opportunity



**BLOCKCHAIN**



# A Blockchain solution for SMEs

