On Blockchain

Innovation at LSEG – Chris Corrado

LSEG DLT Story 2015 to today

Internal and External

Internal

- Assessment of technology

- Contributing to open source project

HYPERLEDGER

- Continuing assessment of business use cases

- Identified Business Use Case – **Trade Reconciliation**

London Stock Exchange Group
LCH The Markets' Partner

- Development and Delivery of PoC

- Identified Business Use Case – **Private Equity Shares**

Monte Titoli London Stock Exchange Group

- Development and Delivery of PoC

2015   **2016**   **2017**   **2018**

External

- Assessment of emerging technology platforms

c•rda   **ENTERPRISE ETHEREUM ALLIANCE**

- Engaging with Regulators

FCA FINANCIAL CONDUCT AUTHORITY   **European Commission**

- Engaging with external companies such as vendors, consultancies

2016, Way Back in the Early Days of DLT

(+) Consortium, **(+)**Smart Contracts, **(-)**High Membership Fees, **(-)**Not Open Sourced, **(-)** Objectives Not Clear

(-) Focused on Public **(-)**Not Enterprise Standards **(-)**Associated with Cryptocurrency

(+) Open-source,**(+)** Smart Contracts, **(+)**Private Permissioned Network, **(+)**Partnered with Technology Leaders

(-) Not Open-Source **(-)**No Live Implementation **(-)**Single Vendor **(-)**Specialized Focus

Hyperledger ticked all the boxes

✓ **Open-source DLT Platform and Community**
✓ **Offers flexibility in implementation that meets industry requirements:**

- Redundancy & Resiliency – No single point of failure

- Private Network - Allows for creation of a private network that meets enterprise standards

- Data Segregation - Participants only see and receive their permissioned data

- Flexible "Consensus"

✓ **Supported by leading technology companies and associations:**

- Intel

- IBM

- The Linux Foundation

DLT Today, Rapid Evolution = Different Evaluation

(+) Consortium, **(+)**Smart Contracts, **(+)**Open-source **(+)**Private Network, **(+)**Partnered with Technology Leaders , **(+)** Tools for Financial Service Implementations

(+) Public or Private, **(+)** Enterprise Standards, **(+)**Consortium, **(+)**Open-source **(+)** Beyond Cryptocurrency, **(+)** Large developer community **(+)** Large Technology Provider Community

(+) Open-source,**(+)** Smart Contracts, **(+)**Private Permissioned Network, **(+)**Partnered with Technology Leaders
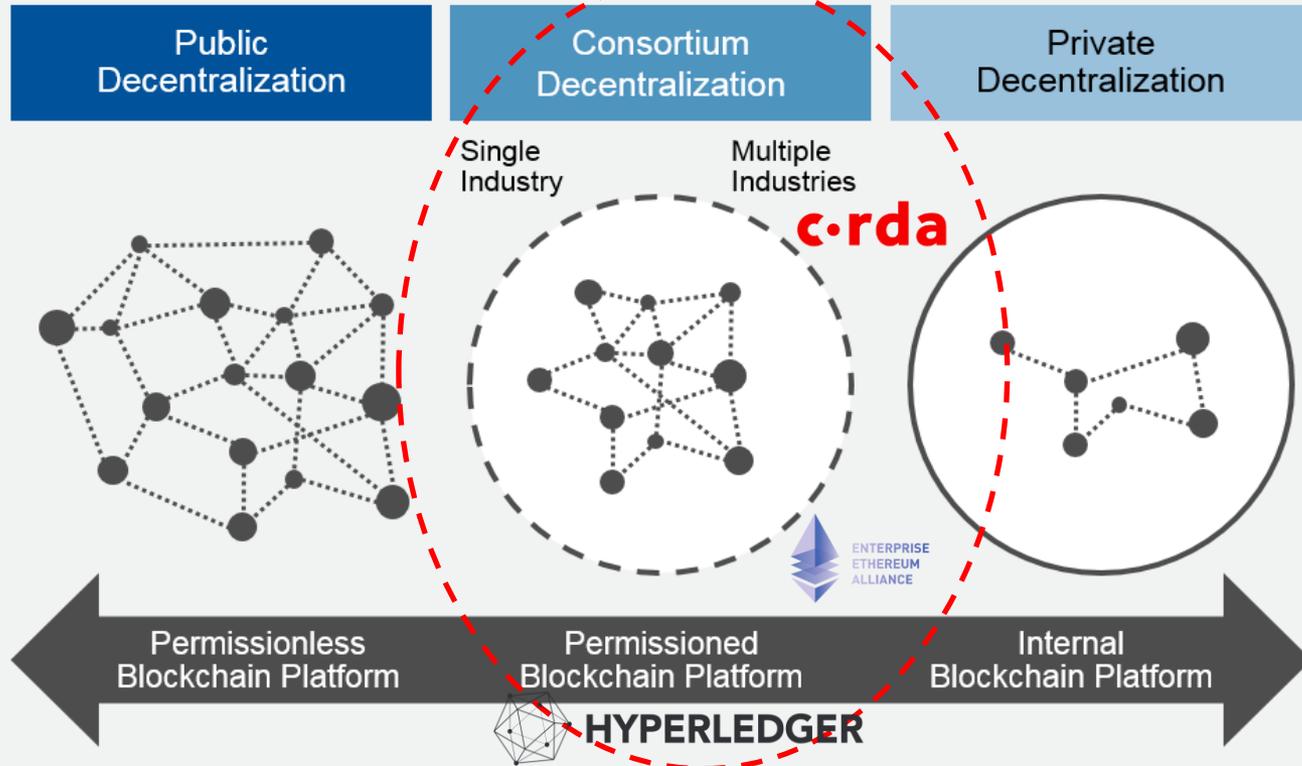
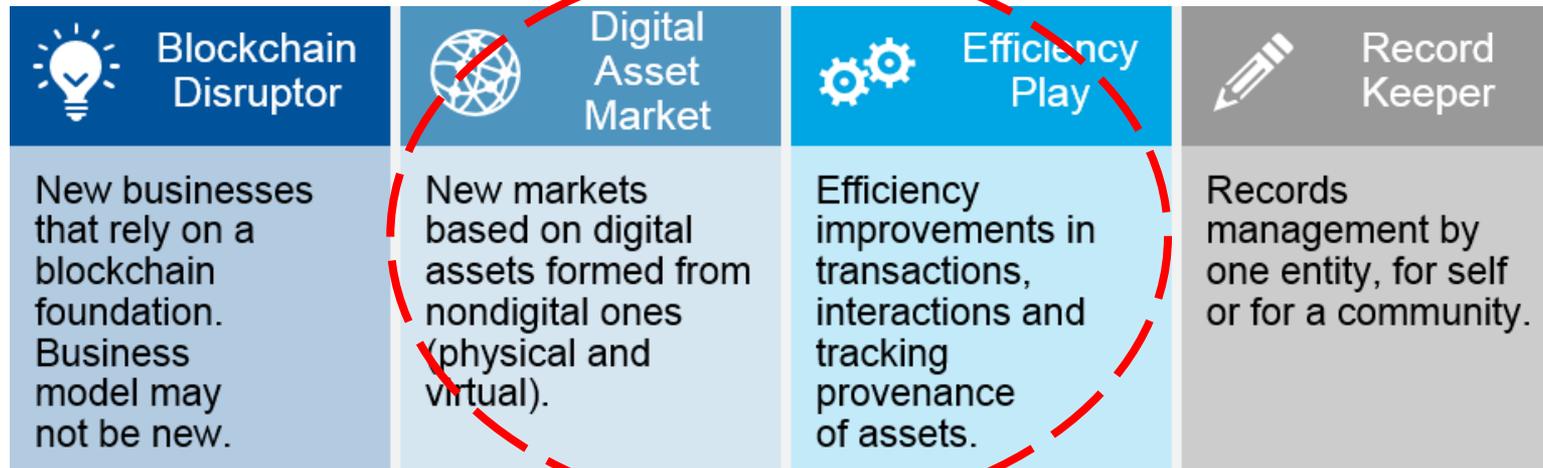**(-)**Not Open-Source **(+)** Live Implementations on the way ,**(-)**Single Vendor, **(+)**Industry specific development tools

Where do we focus, and what platforms fit?

- **Financial Institution Requirements:**
- Confidentiality
- Security
- Data segregation and privacy
- Regulatory Visibility
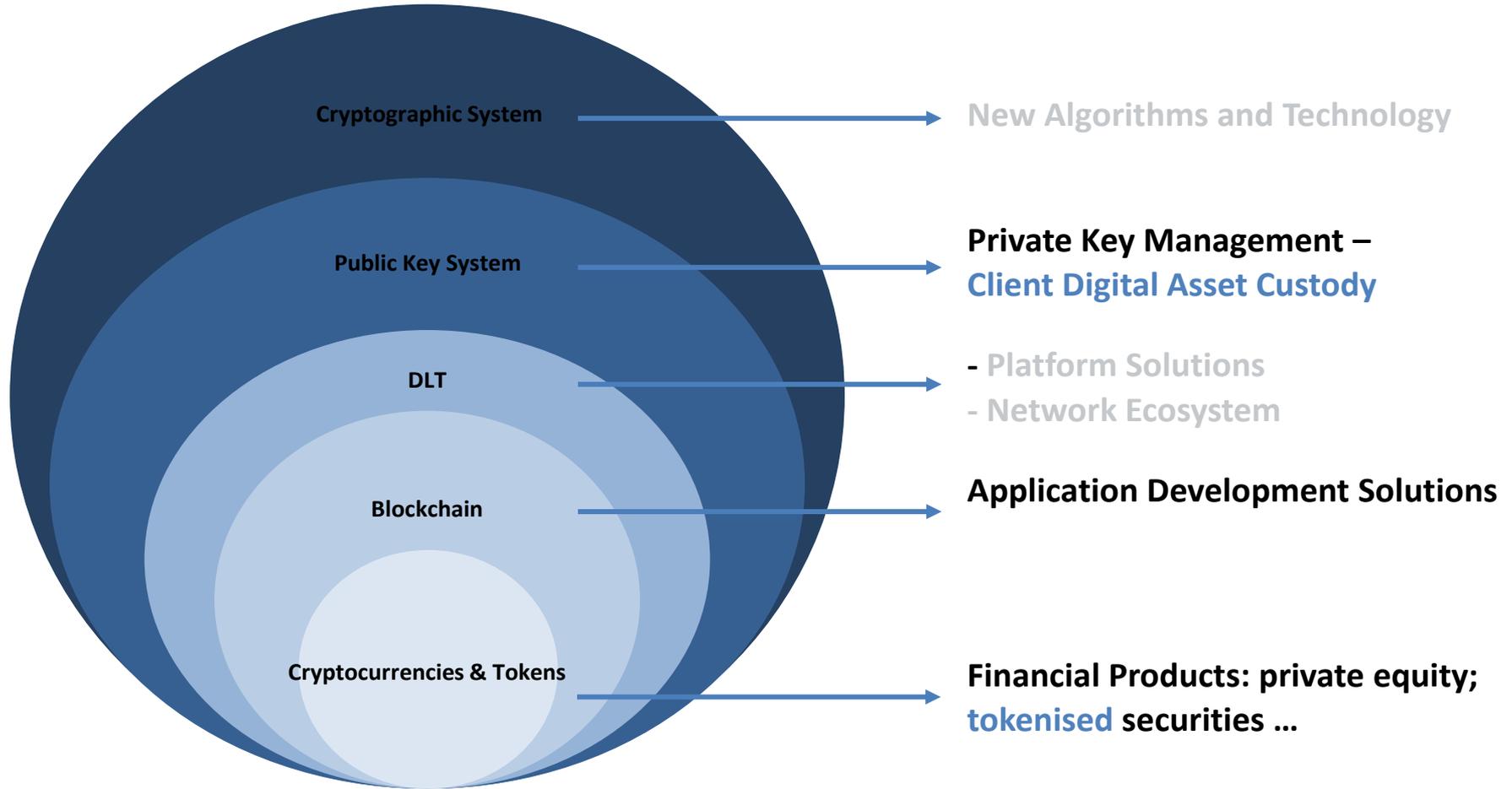- Redundancy

Building a strategy, where we see opportunity

Blockchain Disruptor	Digital Asset Market	Efficiency Play	Record Keeper
New businesses that rely on a blockchain foundation. Business model may not be new.	New markets based on digital assets formed from nondigital ones (physical and virtual).	Efficiency improvements in transactions, interactions and tracking provenance of assets.	Records management by one entity, for self or for a community.

Efficiency Plays – Post Trade
- Reduced Settlement Times
- Collateral Efficiencies
- Direct Regulatory Reporting
- Elimination of reconciliation
- Reduced IT change cost across participants

Digital Assets – Capital Markets
- Capital Raising For SMEs – Digital Issuance of Shares
- Direct issuer / investor engagement and reporting
- Digitized Commodities and creation of new products

Business Opportunities

Cryptographic System → New Algorithms and Technology

Public Key System → **Private Key Management –**
Client Digital Asset Custody

DLT → - Platform Solutions
- Network Ecosystem

Blockchain → **Application Development Solutions**

Cryptocurrencies & Tokens → **Financial Products: private equity; tokenised securities …**

DLT in the Future for LSEG

We see DLT enabled business opportunities in these areas in the near future :

- **Enabling New Business via Digital Assets – Shorter Term**

  - Digitalisation of bonds and equities for SMEs

  - Creation of new secondary markets for smaller issuers

  - Lower cost capital raising for SMEs on DLT networks, direct shareholder engagement

  - Digitized Commodities

- **Creating Efficiencies & New Capabilities – Longer Term**

  - Reduced need for CSDs, Custodians – Rethinking Existing Market Structure.

  - Post-trade: T+0 settlement time and reduced efforts in trades reconciliation.

  - Reduced cost of bespoke product creation for derivatives

  - Shared business logic and data model = reduced development costs

LSEG Industry Collaboration Approach

Consortium Membership

- **Hyperledger Project**
  LSEG working closely with the development team and has contributed to its public repository

- **PTDL Group**
  LSEG is one of the founding members and member of Organising Committee

- ***Actively looking at other consortiums …***

External Engagement

- **Engagement via private and public conferences**
  - LSEG has long been an active player at conferences

  - LSEG has established good relationships with its clients who share interests in the DLT space

  - LSEG has active engagements with regulators such as EC, BoE, FCA, HMT

Internal Engagement

- **Gather interest via internal client facing teams**
  - LSEG has a rich ecosystem that spans over multiple sectors in the financial industry, e.g.: CSD, Investment and Growth, Issuance and Trading, Clearing Business, Information Services etc.

What have we learned?

Blockchain's immediate and best opportunities are in providing new infrastructure where none exists today:

- Small to medium enterprise capital raising and bond issuance.
- Creation of a secondary market and standards of valuation from smaller companies.
- Digital representations of commodities allowing instant value transfer.

Replacing existing infrastructure and replacing existing businesses with DLT will be a long road:

- New decentralised networks that support critical infrastructure must be created around legal, regulatory certainty
- Shared infrastructure that spans deeply across participants in a business requires well developed standards.
- Interoperability barely being tackled thus increasing duplication and cost.

Blockchain and DLT is still too young to focus on one dominant player:

- Specialisation of products started to emerge, but few actual projects have gone to production.
- Underlying platform choice is driven by requirements and business case, no **TRUE** one size fits all today resulting in duplication.

What do we want to learn, how will we measure?

Blockchain developments are coming fast, the challenge is how to consistently evaluate these platforms for enterprise readiness – <u>Consistency is key </u>in measuring:

- **Scalability and performance** – By developing a framework of standardised testing, we are able to conduct like for like performance comparisons.

- **Frameworks and standards** – Reducing execution risk requires simplifying blockchain's common challenge – managing a consistent view of state in a decentralised environment – does the smart contract language do this?

- **Deployment & Infrastructure** – How complex and costly is it to create a private network? A major 'gotcha' of DLT cost

<u>**What we'd like to know more about: Big Questions that require experimentation and discussion.**</u>

Enterprise Ethereum

- Asset digitisation and private deployments – Is Enterprise Ethereum a better platform for creating digital assets? How does it scale when put under transaction load test? Is this the go-to platform for digital assets?

Corda

- Scalability & Financial Instrument Modelling – Do these benefits sufficiently solve managing a view of state?

Proprietary Platforms – SETL, DAH

- Do their value-add products such as DAML help us tackle challenges of DLT of managing state, modelling workflows thus reducing execution and scalability risks and go to market faster?

- Do their industry focused tools' benefits outweigh the costs of their platforms and the risk of focusing on one vendor in a nascent space?