Permissioned Blockchain and Enterprise Case Studies

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Blockchain is here and everywhere

- **Sweden**
  - Smart Contract for Land Registry
  - Minimize risks, regulate workflow

- **Delaware**
  - Secure recording and tracking of documents
  - Faster search, increase confidence/transparency

- **California**
  - Token for real estate transactions
  - Cross-border payments for investors

- **Georgia**
  - Land titling on Blockchain
  - Real-time audit & reduce costs

- **Florida**
  - Real estate contracts on Blockchain
  - Verify accuracy of data

- **Honduras**
  - Secure recording and tracking of land titles
  - Reduce fraud & secure mortgages, mineral rights

- **Japan**
  - Land registry data on Blockchain
  - Data cross-referencing, improve efficiency

- **China**
  - Digital currency
  - Bank payment facilitation

- **Hong Kong**
  - Real-time property valuation
  - Mortgage alerts & records
  - Trade Finance
  - Improved efficiency, double financing prevention

- **Canada**
  - Project Jasper
  - Faster and easier interbank payment

- **United States**
  - Secure recording and tracking of documents
  - Faster search, increase confidence/transparency

- **Ukraine**
  - Election platform
  - Prevent fraudulent vote
  - E-money
  - Faster interbank settlement

- **Estonia**
  - X-Road implementation
  - Faster company registration

- **Germany**
  - Smart Tenancy Contracts for landlords
  - Secure bond management & reduce expenses
  - Sale of government bonds
  - Bond market facilitation

- **Russia**
  - Use of Blockchain on Unified State Register of Real Estate
  - Increase transaction confidence & security of property rights

- **Dubai**
  - Real estate contracts on Blockchain
  - Verify accuracy of data

- **Holland**
  - Smart Tenancy Contracts for landlords
  - Secure bond management & reduce expenses
  - Sale of government bonds
  - Bond market facilitation

- **Singapore**
  - Tokenize transactions by real estate-backed cryptocurrency
  - Improve liquidity & transparency
  - Project Ubin
  - Faster interbank payment
  - Trade Finance
  - Easier document exchange, double finance prevention

- **India**
  - Real estate contracts on Blockchain
  - Verify accuracy of data

- **Mexico**
  - Secure recording and tracking of land titles
  - Reduce fraud & secure mortgages, mineral rights

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Voltron consortium grows to over 50 banks and corporates

08 May 2019

The blockchain-based trade finance coalition Voltron has swelled to over 50 banks and corporates following the completion of trials involving the simulation of multiple digital Letter of Credit transactions across 27 countries on six continents.
Public Blockchain

• All participants on a public Blockchain can freely join or leave.
Consortium Permissioned Blockchain

- Participants seek permission to join from a group of participants which form a consortium.
- Participants join and leave a consortium permissioned Blockchain in a managed manner.
- Onboarding procedures, governance and rulebooks are in place.
Blockchain (Distributed Ledger Technology) is a technology.

Blockchain has many applications:
• Cryptocurrencies (Bitcoin, Ethereum, Ripple, Monero, Libra…)
• Trade Finance
• Supply Chain
• Insurance
• Central Bank issued Digital Currency
• etc.

Blockchain’s fundamental technologies:
• Cryptography (digital signatures, cryptographic hashes, zero-knowledge proofs, …)
• Consensus Algorithms (Proof-of-Work, Proof-of-Stake, Byzantine-Fault-Tolerance, …)
• Peer-to-peer Networking
• etc.
Use Cases
Trade Finance

Buyer

Commercial Documents

Buyer's Bank

Transportation Documents

Banking Documents

Seller

Buyer's Bank

Commercial Documents

Seller's Bank

Transportation Documents

Banking Documents

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Today’s trade finance pain points that DLT is addressing.

- Huge market: USD 16 trillion trade globally, USD 36 billion revenue in trade finance
- Huge China market: USD 4.62 trillion trade, USD 750 billion LC (letter-of-credit) trade.
- Huge Financing Gap (USD 1.6 trillion)
- Paper-based and trapped in digital silos – creates major fraud, compliance and audit risks
- Costly and Slow, Fragmented processing, Error-prone and redundant process
- 35% cost reduction
- Highly transparent for much lower financing risk, opening up an additional trillion dollars of global trade
- Trustworthy, low-cost and fast
  - No more disconnected systems, all parties on the same platform
  - End-to-end trade finance
  - Blockchain brings all parties onboard, no more digital islands
- Minimal manual interaction, smart contract guided
- Fully digitized with backward compatibility

Sources:
- International Chamber of Commerce (ICC), Pg 56, https://iccwbo.org/publication/2017-rethinkingtrade-finance/
Heavily Simplified Trade Finance Workflows

Letter-of-Credit Issuance

Letter-of-Credit Presentation
Voltron – A Letter-of-Credit DLT Platform

• Voltron is a blockchain-based open industry platform to create, exchange, approve, and issue Letters of Credit on Corda, R3’s blockchain platform.

8 Founding Member Banks

- Bangkok Bank
- HSBC
- SEB
- CTBC BANK
- BNP PARIBAS
- NatWest
- ING BANK
- Standard Chartered

Participating Corporates

- Cargill
- RioTinto
- TRICON
- BM
- Reliance Industries Limited
- GC MARKETING

Solution Delivery Partners

- CryptoBLK
- R3

3rd Party Collaborators

- Bolero
- Microsoft
- eoss
Central Bank Digital Currency (CBDC)
Central Bank issued Digital Currency (CBDC)

- Current post-trade process takes T+3 (3 days after confirmation) to complete.

- High cost, and causing principle risks: the risk of the seller of a security failing to receive payment despite fulfilling delivery, or the risk of the buyer of a security failing to receive delivery despite fulfilling payment.

Reference: EMEAP Redbook 2011 - Payment, clearing and settlement systems in Singapore
MEPS+ is an RTGS system implemented and operated by MAS, comprising two subsystems: MEPS+SGS, and MEPS+IFT. The former handles the scriptless settlement of MAS-issued SGS on a DvP basis, while the latter enables high-value SGD-denominated interbank funds transfers.
Central Bank issued Digital Currency (CBDC)

- Tokenized assets
  - Digitized SGD
  - Digitized securities
- 24x7 trading
- T+0 real-time settlement
- Reduced cost and risks
Know Your Customer (KYC)
KYC is a process through which Financial Institutions (FIs) can obtain some client information, and is crucial to ensure that FIs’ services are not misused.

In its simple form, KYC can be considered as a set of standardized steps being completed by FIs when customers open an account (onboarding).

More importantly, KYC is a repetitive process that client information needs to be updated periodically and on-demand basis.
Know Your Customer (KYC)

- KYC processes can be labor intensive, time consuming, and expensive.
- Large global financial institutions are looking to, or have embarked upon, transformative projects to reduce their high KYC operations spending (on average, US$150mn).
  - Thomson Reuters Global KYC Survey 2017, an independent research survey of over 1,000 financial institutions. Figure is based on group-wide spend of financial institutions with a turnover of $10bn+.
- Improving the cost and efficiency of KYC processes has been at the forefront of financial institutions’ strategies in recent years.
  - Boards are placing unprecedented pressure on the KYC function to reduce operating expenses.
  - Regulators are expecting enhanced compliance measures and standards from financial institutions.
  - Customers are expecting an improved and streamlined banking experience.
Each Financial Institution (FI) runs a DLT node.
- DLT network ensures immutability with timestamps, KYC data integrity traces, transactional metadata, and all update/access logs recorded. No actual KYC data is stored on the DLT.
- Actual KYC information transfer is carried out directly between individual FIs via APIs of their off-ledger private database systems.
- Each “customer” can be uniquely identified using a set of masked pseudonyms (e.g. derived from HKID or BR thru crypto-hash).
- BNO (Business Network Operator) administers FI onboarding, but has no visibility on actual KYC information.
- Regulatory bodies can supervise KYC processes through a DLT Observer node.

Immutable timestamps, integrity check, audit logs

End-to-end Secure KYC Information Transfer

TLS and Firewalled with Load Balancer and HA
1. Onboarding and KYC docs

2. KYC docs

3. Immutable timestamp, integrity digest, metadata

4. Onboarding transfer

5. Query

6. Query

7. Positive Response

7.5. access consent

8. KYC docs transfer

8.5. integrity check and confirmation
Thank You

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