

APAC Securities Market Practice Group Meeting in Hong Kong

Consideration of New Technology in Financial Market Infrastructure

Adaption of Blockchain

Taketoshi Mori

Email:taketoshi.mori@tohmatu.co.jp

Tel:+81-8032455324

Deloitte Touche Tohmatsu

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1. About the information of Blockchain

At the Cusp of a Technology Paradigm Shift

Financial technologies will disrupt traditional financial models and businesses, providing an array of new services, structures and ways of working with technology-based processes

A technology revolution every 20 years?



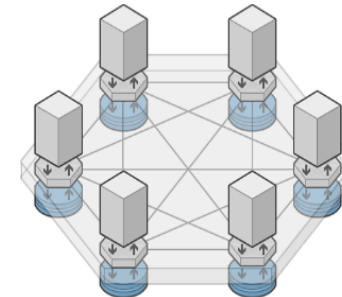
Personal computer

1970s



Internet

1990s



Blockchain

2010s

The application of blockchain technology is changing the role of trusted third parties.

What the Experts Are Saying

“You should be taking this technology as seriously as you should have been taking the development of the internet in the early 1990s” – [Blythe Masters, Sept 2015](#)

“The Blockchain protocol threatens to disintermediate almost every process in financial services.” – [World Economic Forum, September 2015](#)

“We can re-implement the entire financial system as a distributed system as opposed to a centralized system. We can reinvent the entire thing.” – [Marc Andreessen, October 2014](#)



**\$20
Billion**

Santander Bank estimates a reduction in infrastructure costs for banks of \$20bn / year by 2022 because of blockchain



**\$1.1
Billion**

*Aite Group sees steady increase of capital markets IT spending between now and 2019.
\$1.1 billion in total*

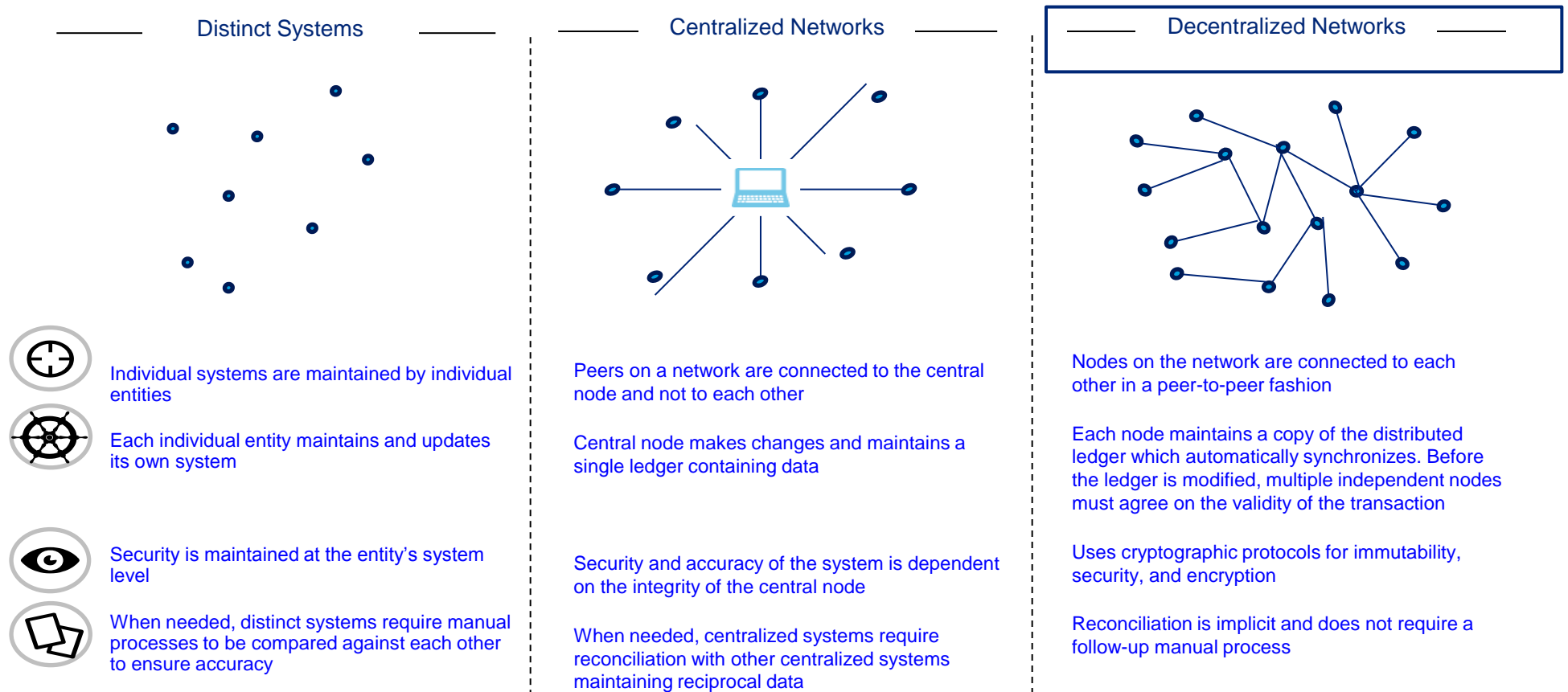


**\$1
Billion**

Total VC investment in Blockchain startups to date (November 2015)

Blockchain Structure Overview

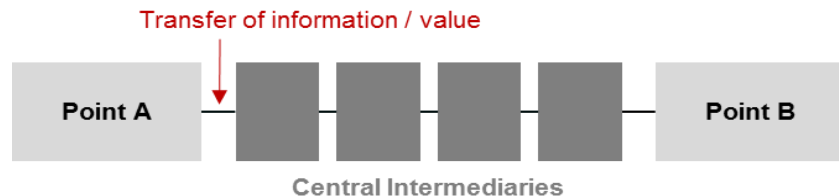
Blockchain technology can be used to record and prove transactional integrity and accuracy of a company's finances without the need for an intermediary or third party. The distinction between existing network structures is highlighted below:



Blockchain utilizes distributed, replicated ledgers to transfer value securely at a low cost

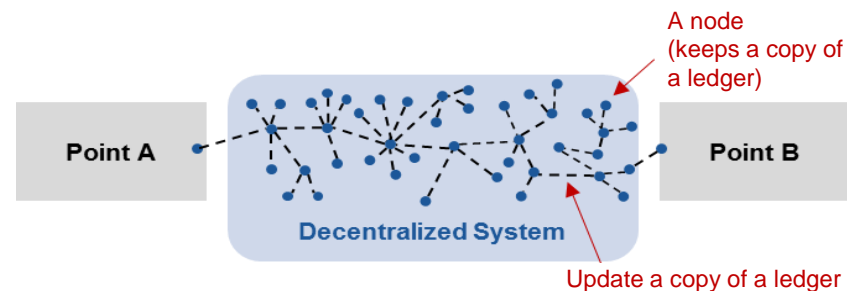
How does Blockchain differ from traditional systems?

Traditional (Centralized) Systems



- A central intermediary (e.g., a bank, ACH) transfers actual value between two parties
- All parties involved in a transaction maintain a separate ledger
- Often requires multiple intermediaries to connect parties because no single intermediary has connections to all parties
- Security and accuracy of system is dependent on each central intermediary

Blockchain



- Each node keeps a copy of a single **distributed ledger**, which is updated upon a transaction request
- Requires validation of **consensus** among several copies of a ledger kept at **multiple individual nodes** prior to approval of the request to maintain accuracy
- Utilizes **cryptographic protocols** for enhanced security
- Has **native currencies** that can be transferred within the system, often exclusively

Characteristics of Blockchain



Fast

Copies of a distributed ledger are automatically updated, shortening transfer time from days to minutes or seconds



Very low costs

Transactions are processed by nodes that offer processing power without compensation



Open source

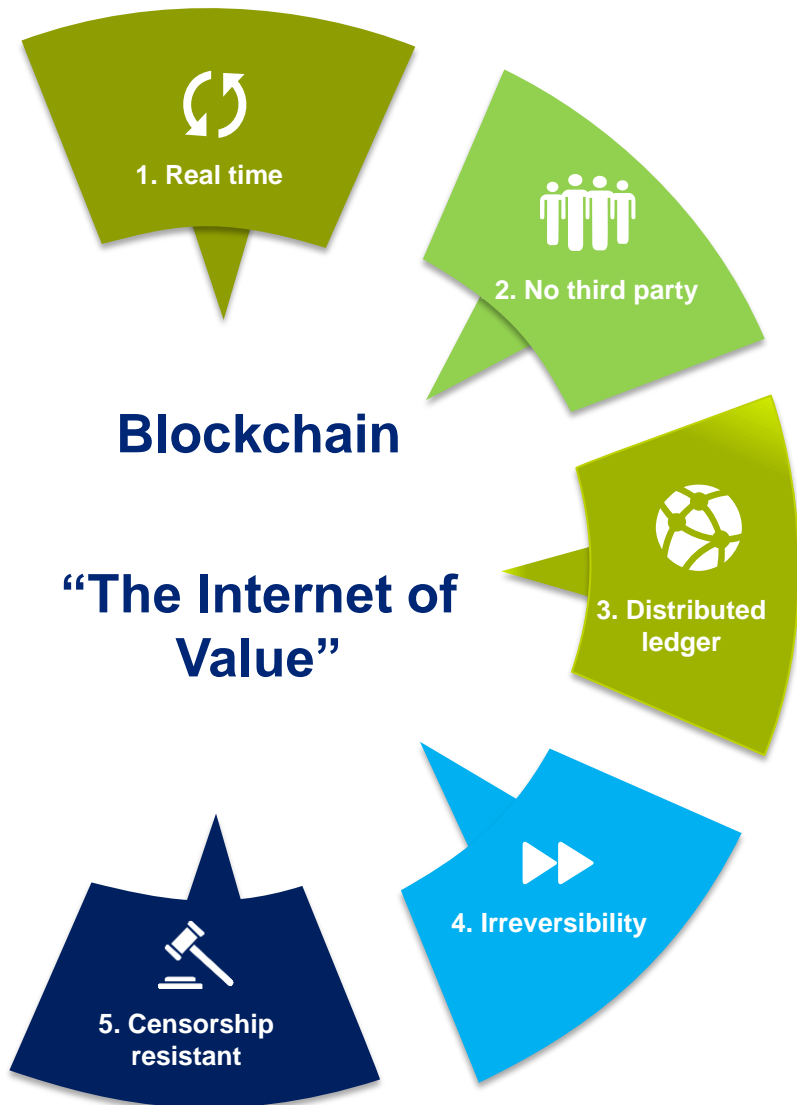
A common set of protocols used by the system is governed and maintained by a network of participants



Traceable

A record of each transaction is distributed among multiple nodes, offering superior immutability and traceability

Very unique characteristics of Blockchain create a unique potential to transform the financial services infrastructure



1. Real time

Blockchain enables the near real time settlement of recorded transactions, removing friction, reducing risk but also limiting ability to charge back. Smart contracts were developed to address this.

2. No third party

Blockchain technology is based on cryptographic proof instead of trust, allowing any two parties to transact directly with each other without the need for a trusted third party.

3. Distributed ledger

Blockchain technology includes a distributed ledger which generates computational proof of the chronological order of transactions. The peer-to-peer distributed network records a public history of transactions that quickly become computationally impossible for an attacker to change. Blockchain does not typically preserve the identities of the parties nor the transaction data, only the proof.

4. Irreversibility

The blockchain contains certain and verifiable record of every single transaction ever made. This prevents double spending, fraud, abuse and manipulation of transactions.

5. Censorship resistant

Work has been completed in crypto economics in order to ensure that the blockchain continue pumping out new blocks and that blocks are not being reverted or altered.

Illustrative Applications

Where is the interest coming from?



Reconciliation and Assurance

Automate financial reconciliations between internal departments of a company or with trading partners. This functionality can provide near real-time confirmations and validations of every transaction.



Land Registry

Digitize and decentralize property deed transfers. Distribute the storage and verification of property deeds significantly reducing the risk of fraud or corruption.



Health Records

Decentralize and digitalize health records while allowing person's complete medical history to be accessible from anywhere in the world.



Customer Loyalty

Create a cost effective and comprehensive rewards system which records all customer transactions.



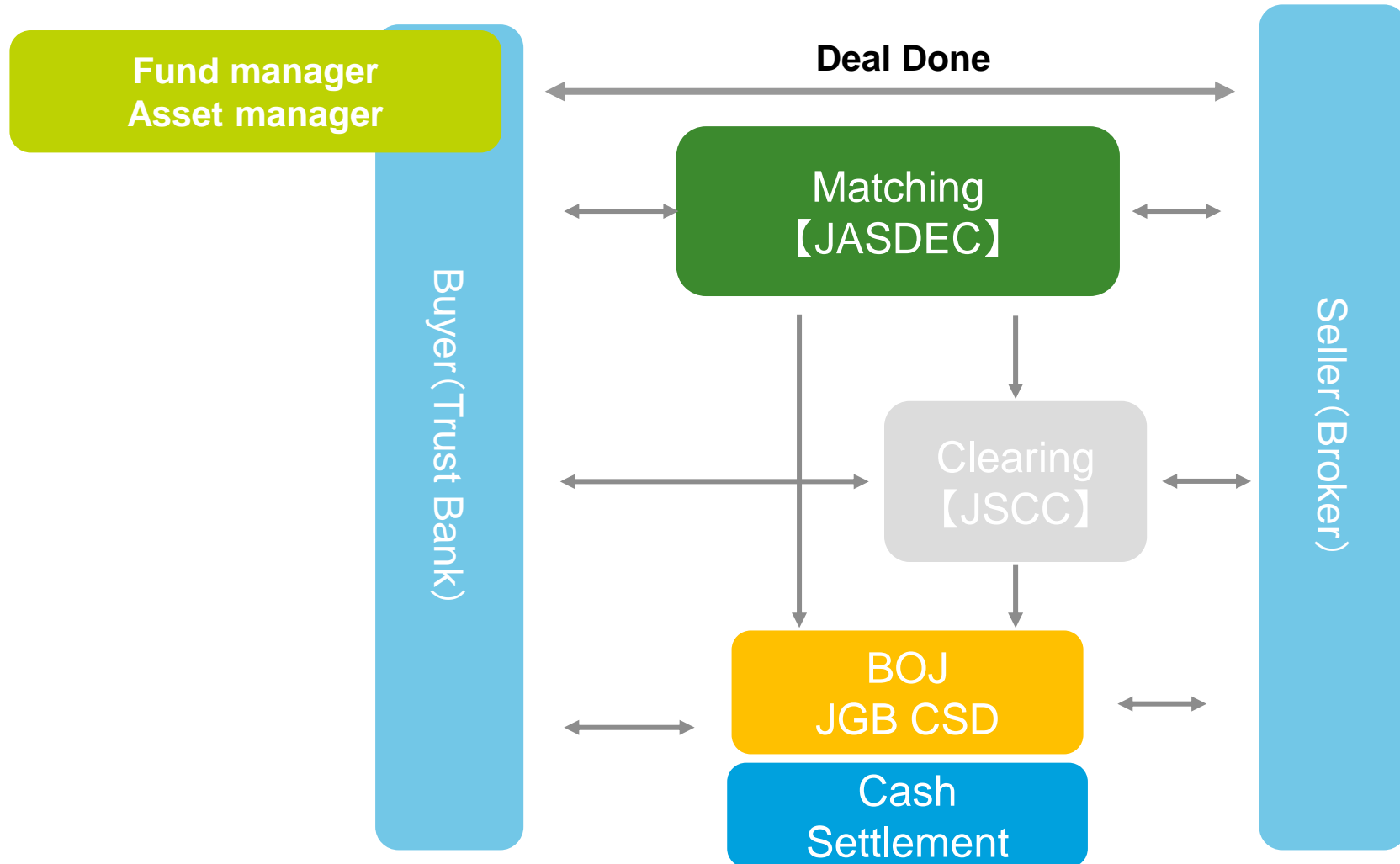
Payments and Settlements

Significantly reduce time and costs associated with traditional payment and settlement infrastructures, and allow for new innovative client products.

2. Current Securities Settlement framework in Japan

Current Flow of Securities Post Trade

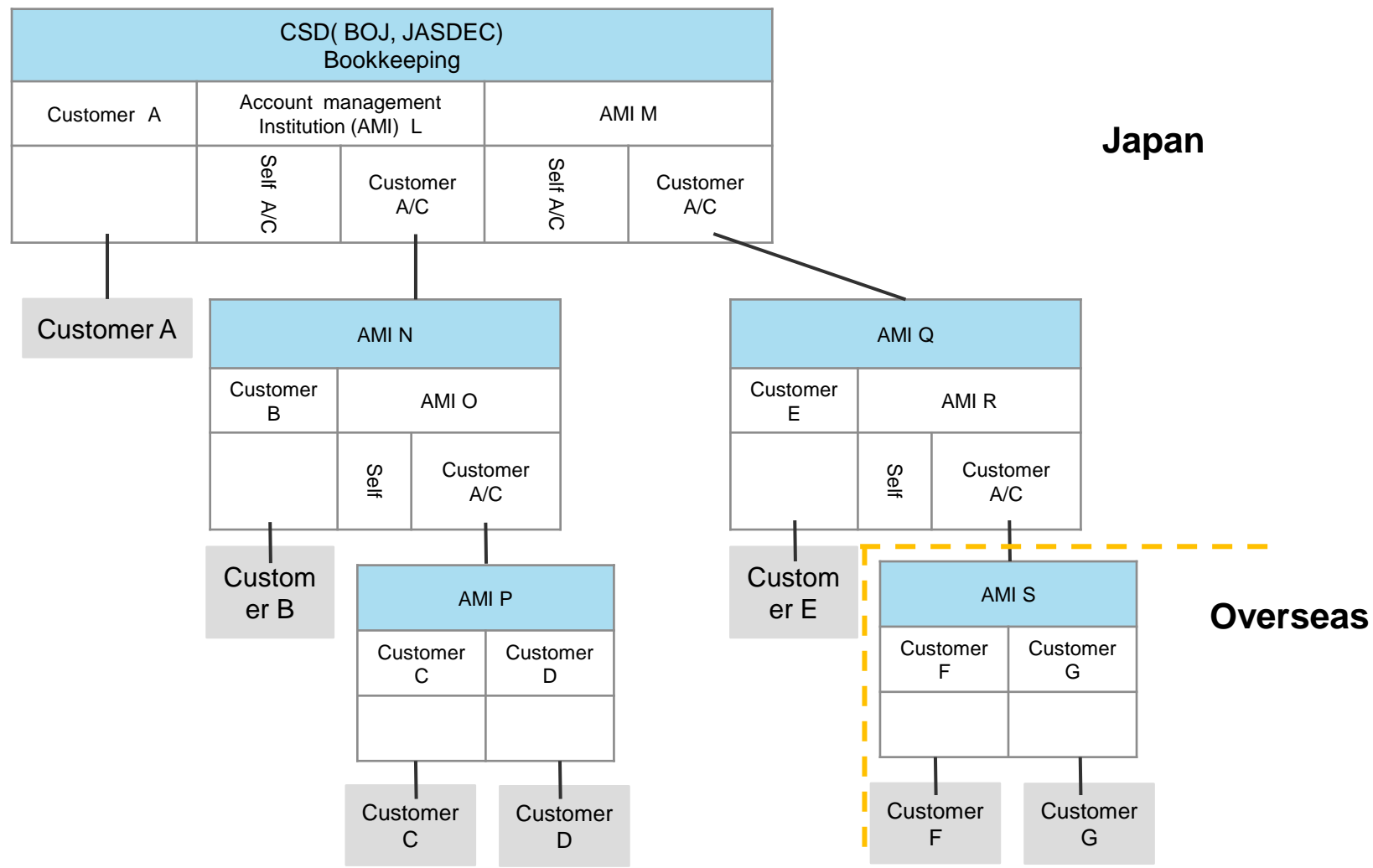
Stakeholder and Flow



Complicate Ledger Structure

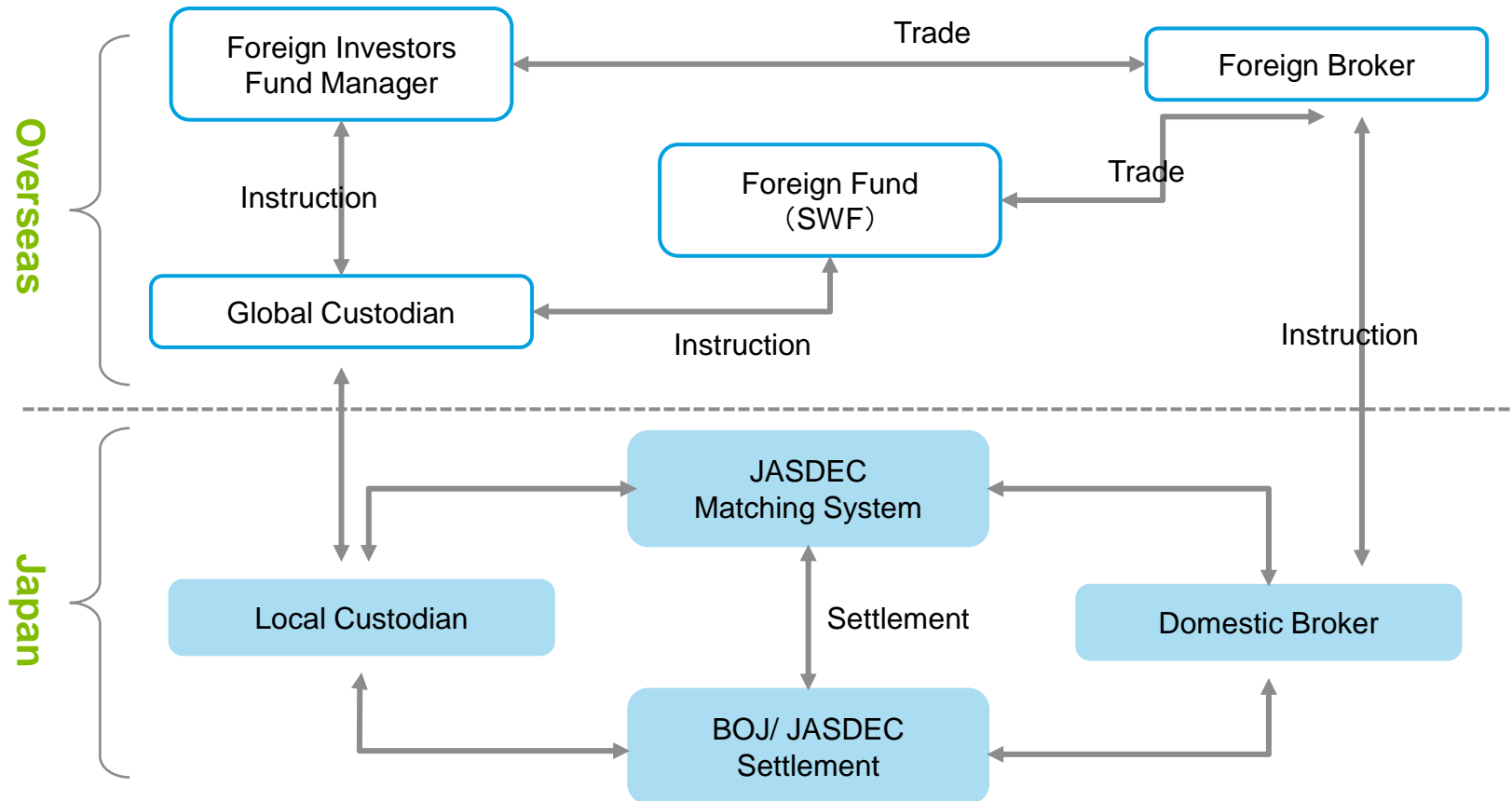
(Framework is stipulated by Act on the Transfer of Corporate Bonds, Government Bonds, Equity)

Image of Multi- tier structure AMI (Account Management Institution)



Foreign Players are more complicated

In Japan, more than 60% are traded by foreign players



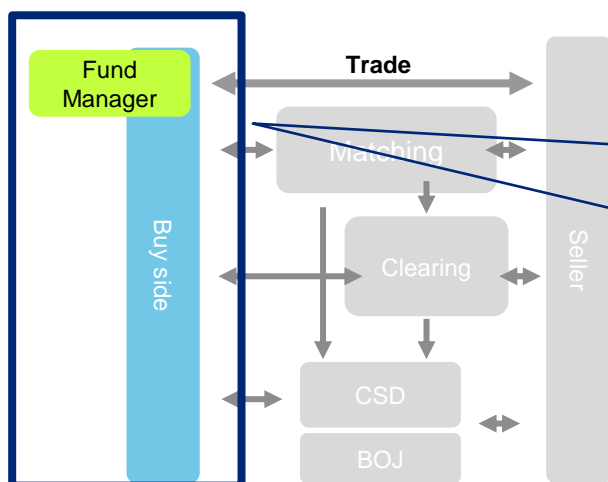
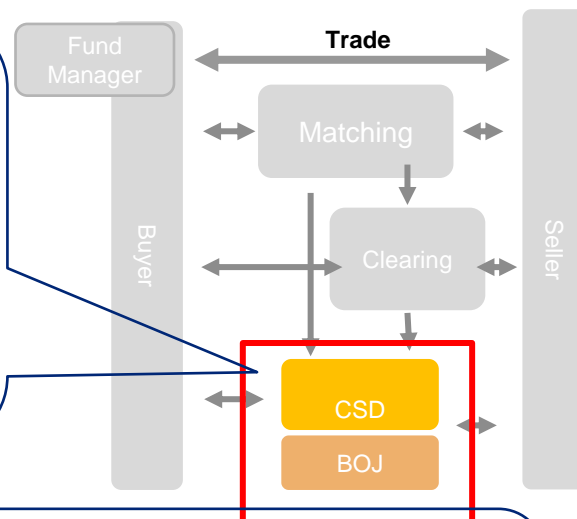
Complicated factors : ■ business day ■ law & regulations ■ jurisdiction

3. Issues of adopting Blockchain in Financial Market Infrastructure

Challenge in domestic models(1/2)

Restructuring business process

- Legally building up the finality of settlement
- Impact from Multi-tier structure to distributed ledger style
- Reviewing the fail- rule(overseas players can adopt not only for shortage of securities but cash shortfall <In principal default>)

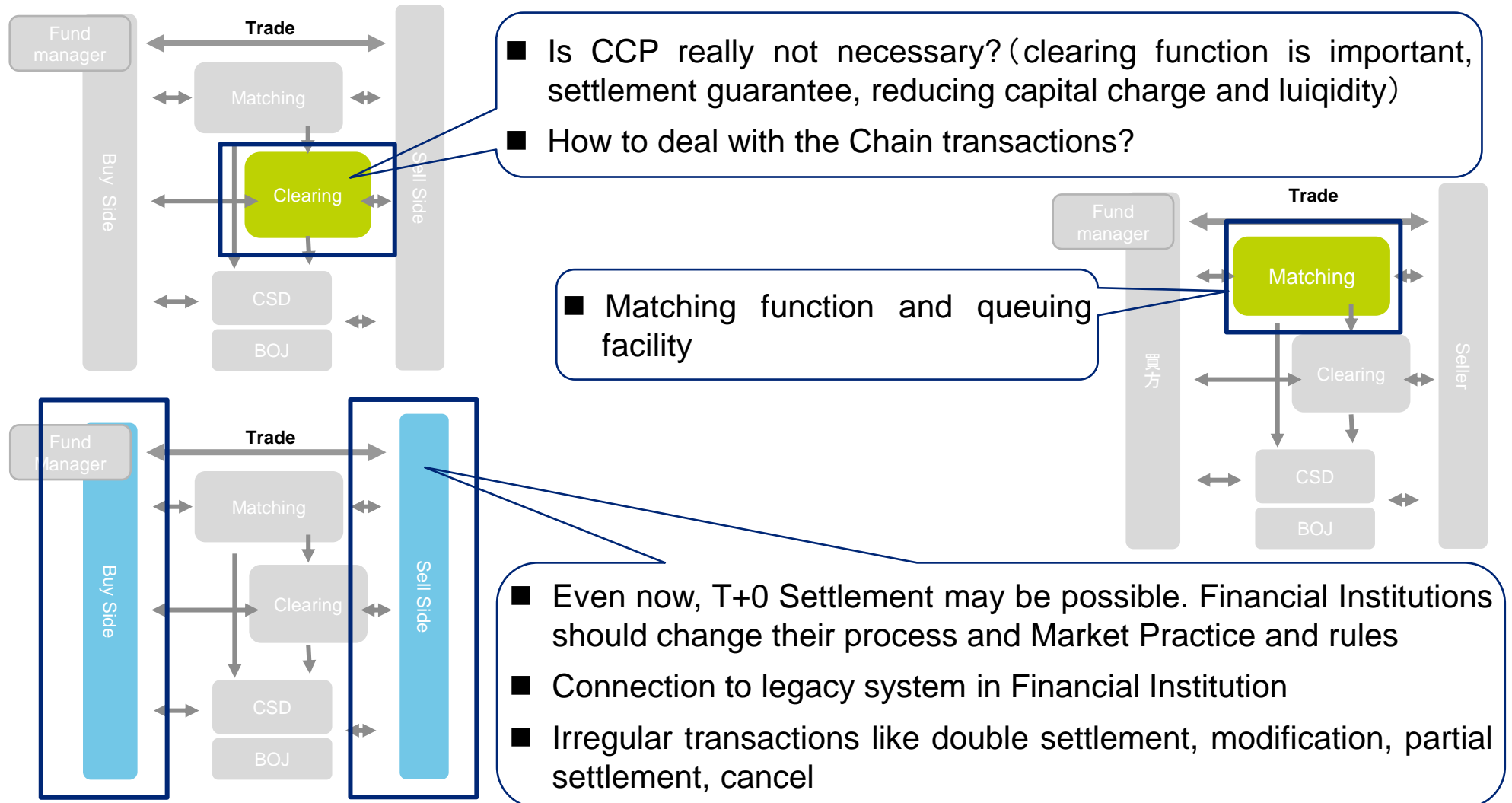


- How can we use Short trade as real-time base settlement. Is it necessary to change the lending rules.
- In terms of treatment of block trades, how can we solve it?

In practical , it is not easy to use the blockchain technology directly to Financial Market Infrastructure.

Challenge in domestic models(2/2)

Restructuring business process

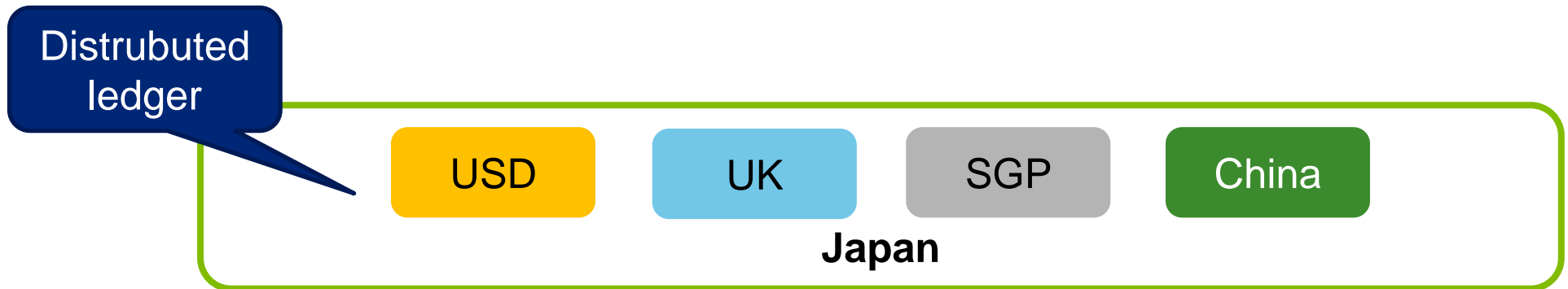


Challenge in global base models

Not only domestic law but global base

【Cross-border Issues】

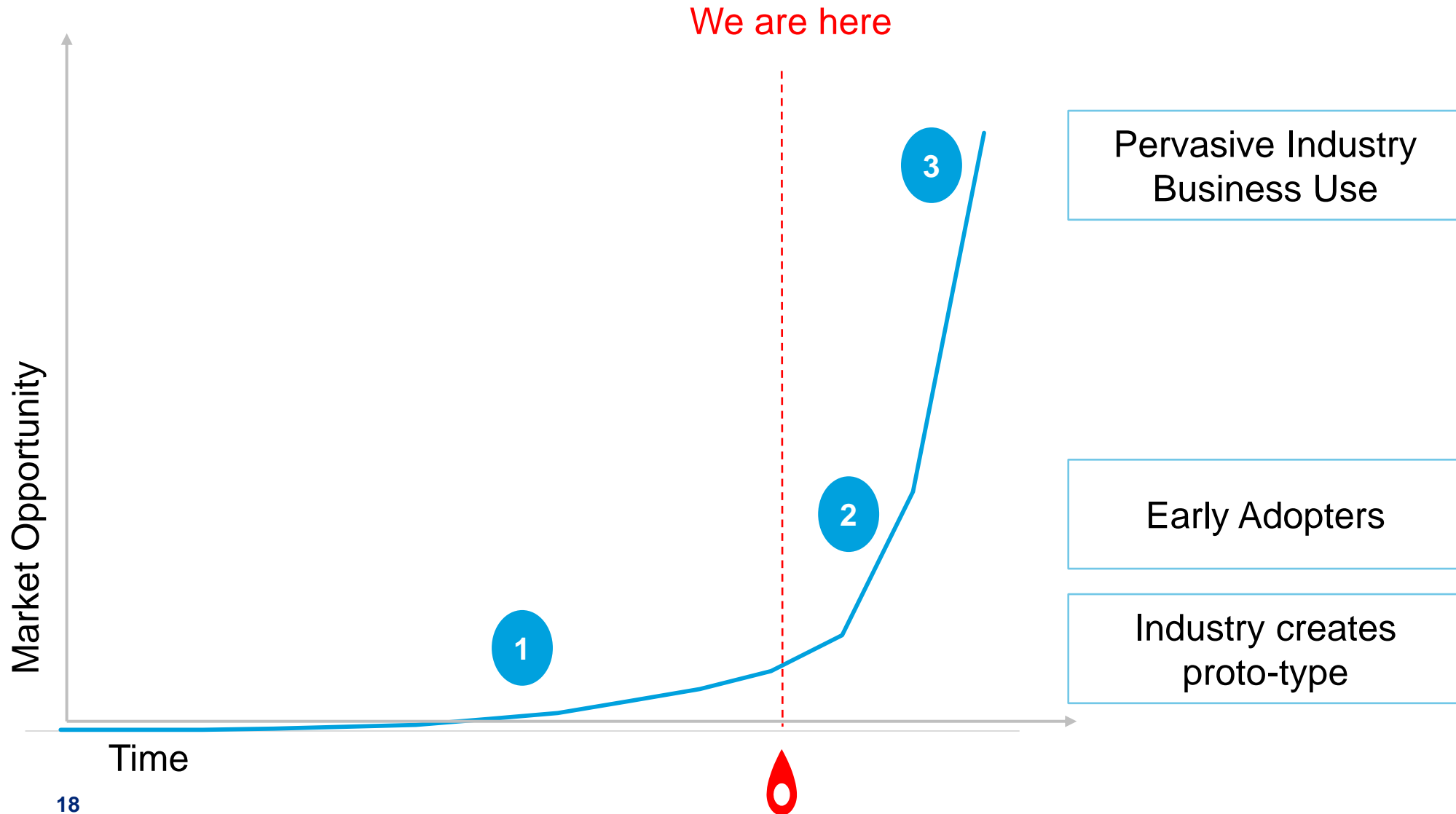
- Different business days
- In the case of bankruptcy of Financial Institutions or issuers (Jurisdiction, booking place, governing law)
- Harmonizing the settlement finality and investor protection (Hague Convention and UNIDROIT: International Institute for the Unification of Private Law)
- Omnibus accounts make more complicated. Increase the risk in the market.
- Conflict of Regulators coverage and surveillance
- 24/7 operation is necessary



It is essential to change business process when adapting blockchain. Creating the proto-type and industry-wide discussion with regulators are needed

- Introducing Blockchain is expecting technology 20% and business process change 80%
 - To utilize the advantage of blockchain technology, business process and market practice should be changed and improved
- Blockchain technology is overestimated these 2 years but underestimated 10 years.
- Blockchain is revolutionary and has improved rapidly, but it might take time to mature.
 - Continuous research is requested to adopt the Financial Market Infrastructures.
 - Especially securities for post-trade are complicated. It is recommended to study demonstration experiment including regulator and market players.
 - Pick up issues and tasks to tackle

The state of blockchain technology



Euroclear White Paper

Initial capital markets start-ups, limited test cases

- Investment in developing next generation technology
- Identifying initial use cases
- Efforts to build industry consensus/traction

Initial 'seeds'/proposals for market standards

- Select industry consortia/groups, public bodies, large market infrastructures outlining/proposing some standards

Ambitious case ?

Thin applications gaining wide industry traction

Initial adoption of distributed ledgers in thin parts of industry-wide value chain

- Overall agreement in standards
- Mutualisation of technology/replacement of existing systems

Base case ?

Bitcoin/cryptocurrency

Bitcoin a v1 application with current developers actively addressing perceived flaws ...

- Throughput restrictions
- Inflexible code architecture

... and preliminary regulatory scrutiny

Today

Disruptive innovations in niche applications

Next generation of applications in

- Bold transformations of small markets
- Narrow applications in large markets

... define new markets that do not exist today

Next 12 – 24 months

5 years

10+ years

Long term mass adoption

- Major industry-wide disruptions
- Lessons learned from numerous iterations
- Industry-wide familiarity and confidence in technology

出典: Euroclear, Blockchain in Capital Markets, The Prize and the Journey p19



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