Report on Pilot Test of DLT Information Sharing Platform in the Field of Securities Post-Trade (Project Name: B-POST)

Oct. 30, 2020

B-POST Project Team

Japan Exchange Group, Inc.
Japan Securities Depository Center, Inc.
NEC Corporation(IT Support Vendor)

Contents

1. Project Background, Objectives, and Implementation

2. Review of Use Cases

3. Future Vision for Operations and IT System in Securities Post-Trade

1. Project Background, Objectives, and Implementation

Project Background and Objectives

Processes in securities post-trade*1 are mostly conducted mutually. It has been pointed out that differences in understanding between counterparties about data and workflows can lead to inefficiency.
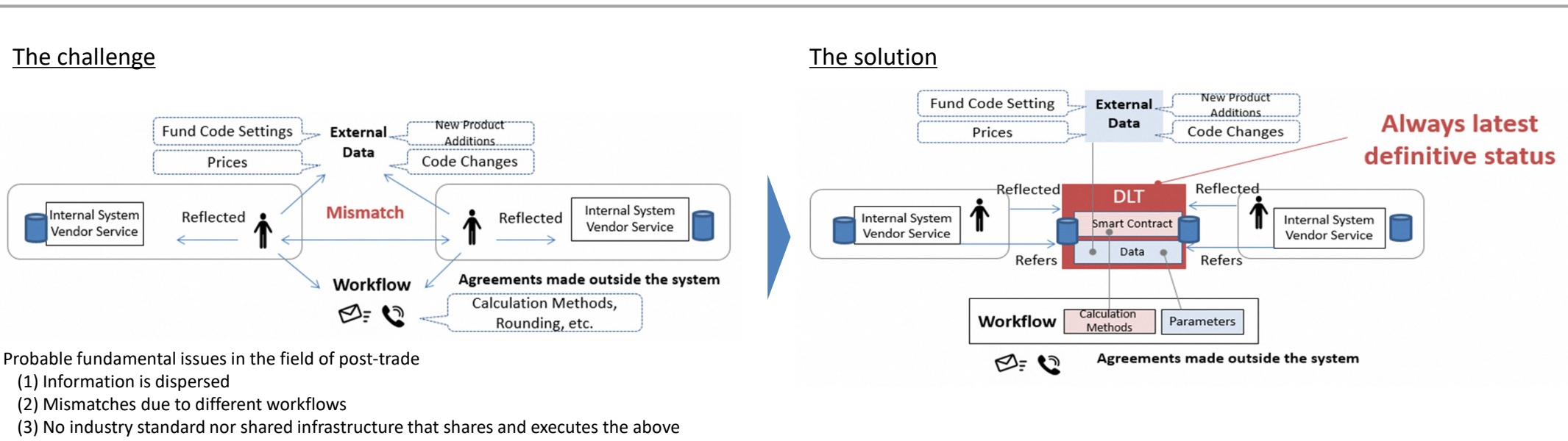
An information sharing platform that synchronizes data and workflows would enable companies to check the latest definitive status of a trade at any time, possibly solving various problems in the post-trade field that companies struggle to solve alone. For this pilot test, we discussed the inefficiencies in securities post-trade and visualized future vision, as well as build a information sharing platform using DLT*2, and invite a wide range of industry participants, including securities companies, asset management companies, trust banks, and service providers to participate in using it. Through verification of the results of these use cases, as well as testing operation of the infrastructure, we considered the feasibility and usefulness of the DLT platform for operations.

*1: Securities post-trade refers to all processes that occur after a securities transaction is executed.
*2: DLT: Distributed Ledger Technology

<The Challenge and the Solution>   Modified from press release on project launch (Mar. 6, 2020)

The challenge

The solution

Probable fundamental issues in the field of post-trade
  (1) Information is dispersed
  (2) Mismatches due to different workflows
  (3) No industry standard nor shared infrastructure that shares and executes the above

Project Approach

- In order to organize the challenge for the industry in securities post-trade, we conducted survey to project participants.
- We categorized the issues based on the survey results and selected three use cases* based on votes by project participants, checked details of the issues, and considered a future vision. In addition, we tested the feasibilities of some of the functions that should be realized based on the vision (built a minimum viable product (MVP)).

* See the next page for details about use cases.

| Solicit issues in industry regarding securities post-trade. (Questionnaire for project participants) | Categorize issues and select use cases based on project participant votes →Select three use cases | Send out questionnaire and have individual interviews with project participants to examine current issues and future vision | Determine requirements for verification (MVP) | Project participants verify feasibility (MVP) | Summarize project results (this paper) |

selected three use cases

• Sent out questionnaire to project participants on issues related to securities post-trade from their perspectives as industry practitioners • Categorized issues based on the questionnaire results into use cases • Selected three use cases to be verified in this project based on votes by project participants	• For selected use cases, sent out questionnaire and had individual interviews with project participants on "inefficient operations and their current responses", "ideas for a future vision to solve issues", and "areas of the future vision that should be verified" • Looked into issues in detail based on the above results and summarized examples of future visions to solve these issues • Built an MVP environment for a verification requirement for some future visions, project participants verified the feasibility, and sent out a questionnaire on the results and compiled them.	• Summarized the project and results of verification

Selected Use Cases

- Collected ideas from project participants about securities post-trade. Categorized the results into nine use cases.
- Narrow down the nine use cases to three use cases based on votes by project participants, looked into the issues, examined future visons, and verified the feasibility.
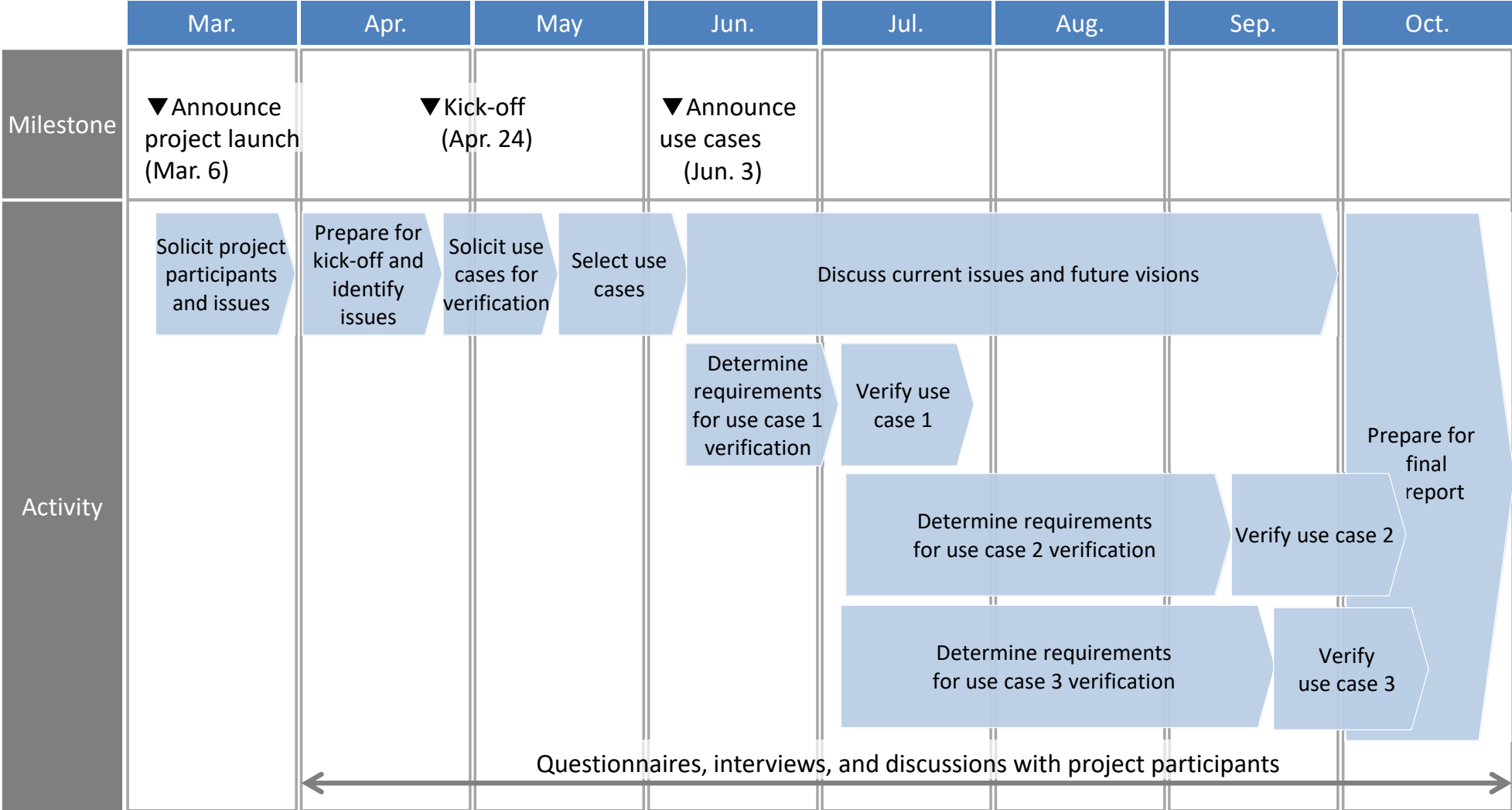
<Use Cases Selected for Verification>

Use Case 1	Sharing fund/SSI/basic corporate information
Use Case 2	Resolution of non-compatibility of fund distribution networks
Use Case 3	Sharing information on borrowing/lending fee, collateral interest and dividend equivalent in stock borrowing and lending transactions

<Other Use Cases Considered>

Use Case (a)	Sharing information on changes in collateral/margin for listed futures and options
Use Case (b)	Sharing information in trade reconciliation for foreign bonds
Use Case (c)	Centralized management of dividend information
Use Case (d)	Centralized management of market price data
Use Case (e)	Centralized management of business days of Asian markets
Use Case (f)	Sharing information on allocation/confirmation (Continue examination of issues from Ph2 DLT application to trade reconciliation) * Issues not related to DLT platform include consideration of unification of the Equity Confirmation format.

Schedule

- The project started in April and discussed issues and future visions of three use cases until the end of October. Project participants themselves also conducted verification.
- The project was completed with the cooperation of project participants for questionnaire, individual interviews, and discussions.

	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
Milestone	▼Announce project launch (Mar. 6)	▼Kick-off (Apr. 24)		▼Announce use cases (Jun. 3)				
Activity	Solicit project participants and issues	Prepare for kick-off and identify issues	Solicit use cases for verification	Select use cases / Discuss current issues and future visions				Prepare for final report

Activity flow:
- Solicit project participants and issues
- Prepare for kick-off and identify issues
- Solicit use cases for verification
- Select use cases
- Discuss current issues and future visions
- Determine requirements for use case 1 verification → Verify use case 1
- Determine requirements for use case 2 verification → Verify use case 2
- Determine requirements for use case 3 verification → Verify use case 3
- Prepare for final report

Questionnaires, interviews, and discussions with project participants

Main Activities (Meetings)

- Given the recent circumstances, to avoid face-to-face contact, all these activities were conducted online.
- In total, 8 meetings involving all project participants and 31 individual interviews and discussions were held.

Date	Meeting name
Mar. 11 & 12, 2020	Project briefing
Apr. 24, 2020	Project kick-off
May 19, 2020	Briefing on use case selection results
Jun. 19, 2020	Use case 1: Briefing on discussions and examinations
Jul. 7, 2020	Use case 1: Briefing on verification details and procedure
Aug. 21, 2020	Use case 2: Briefing on discussions and examinations
Sep. 11, 2020	Use case 2: Briefing on verification details and procedure Use case 3: Briefing on discussions and examinations
Sep. 25, 2020	Use case 3: Briefing on verification details and procedure

In addition to the above meetings, 31 meetings were held between the project owner and each project participant respectively to discuss the issues and future visions.

Project Participants

- Project participants are following.

BofA Securities Japan Co., Ltd.	Nomura Securities Co., Ltd.
Broadbridge (Japan) Limited	OGIS-RI Co., Ltd.
Daiwa Asset Management Co. Ltd.	Rakuten Securities Inc.
Daiwa Institute of Research Business Innovation Ltd.	SBI Holdings Inc.
DTCC Japan K.K.	SBI Securities Co., Ltd.
HSBC Securities (Japan) Limited	Simplex Inc.
Japan Securities Finance Co., Ltd.	SMBC Nikko Securities Inc.
Mizuho Securities Co., Ltd.	Sumitomo Mitsui DS Asset Management Company, Limited
MUFG Bank, Ltd.	The Master Trust Bank of Japan, Ltd.
Nomura Asset Management Co., Ltd.	XNET Corporation
Nomura Research Institute, Ltd.	

And others, 24 companies in total

2. Review of Use Cases

Use Case 1
Results of Examining "Sharing Fund/SSI/Basic Corporate Information" (Summary)

Current Issues

✓ Fund establishment and redemption are routine business operations, and there is the need to proceed while coordinating with many parties related to the transactions (hereinafter referred to as "the related parties") including asset management companies, trust banks, and securities companies.

✓ There are increasingly more operations for reviewing compliance with AML/CFT and FATCA status when establishing a fund and/or commencing transactions, and there is a growing amount of information that needs to be shared among the related parties.

✓ Since there is no comprehensive framework for centrally managing and sharing information among funds and the related parties, such information is communicated separately via e-mail and telephone and is input into in-house systems and JASDEC trade matching system etc., which is inefficient and incurs operational risk.

Future Vision and Matters Discussed toward Its Achievement

✓ If we construct a platform for consolidating information on funds and the related parties for it to serve as a hub to efficiently share information among the related parties, business operations including maintenance of fund information is expected to be more efficient and operational risk is expected to be reduced.

✓ For constructing such a platform, there are topics requiring steady progress for improving the current operational process such as maintenance of fund/SSI information while there are topics requiring to consider new framework including sharing basic corporate information and sharing information among the front, middle, and back offices. It is necessary to consider the response appropriately for each point.

✓ To enable such a platform to be used efficiently, consideration is also needed for establishing a framework where, for instance, standardized information is consolidated and maintenance can be conducted without excessive burden.

Use Case 2
Results of Examining "Resolution of non-compatibility of fund distribution networks" (Summary)

Current Issues

✓ While the current fund distribution network is provided by three system vendors, except for some data, a lot of data is incompatible, and such data is shared among issuers and distributors via fax and e-mail and the result is manually input into systems. For companies that do not use the fund distribution network, They have to exchange information in the same way.

✓ While there is a need for handling new data, such as management reports and information on non-application days, along with existing data in a standardized network, enhancement of standardized data is difficult due to incompatibility issues in existing data.

✓ Since it has become common practice for issuers to use the same network as distributors, multiple contracts are required, which is a burden in terms of cost.

✓ While Japan Investment Trust Association has asked to resolve these issues, they remain unsolved.

Future Vision and Matters Discussed toward Its Achievement

✓ If there is a unified network between distributors and issuers or a platform for sharing information is built and data on distribution of investment trusts are consolidated in compatible data formats, this will reduce the operational burden, system usage cost, and operational risk from unnecessary communications.

✓ By resolving the compatibility issue, data can be enhanced more flexibly and operational efficiency will improve. In addition, if we open up the connections by publishing the specifications for APIs, etc., it could lead to users having more options to choose which system to use.

✓ However, in order to proceed in this way, we will need to provide added value, including data enhancements, and set a lower usage fee rate so that the benefits exceed the cost of changing to a new system.

Use Case 3

Results of Examining "Sharing information on borrowing/lending fee, collateral interest and dividend equivalent in stock borrowing and lending transactions" (Summary)

Current Issues

- ✓ In the stock borrowing and lending transactions, although there is an infrastructure for matching and DVP settlement for transactions for borrowing/lending and returning borrowed stocks, there is no infrastructure for matching the borrowing/lending fee, collateral interest, and dividend equivalent. As such, this portion involves a troublesome process of verifying and communicating the status among two or three parties via e-mail, etc. before matching can be completed. Also, when there is a discrepancy in the calculations, it takes effort to investigate the cause.

- ✓ Although the guidelines for stock borrowing/lending establishes a standardized operational procedure for stock borrowing/lending, the calculation rules are not always consistent with the ones prescribed in the guideline due to processes and practices in mutual fund accounting. Furthermore, the frequency and unit of matching are often decided separately with each counterparty to a transaction, and therefore different procedures are required for each counterparty.

Future Vision and Matters Discussed toward Its Achievement

- ✓ If we can construct a platform for matching borrowing/lending fees, collateral interest and dividend equivalent, and matching can be conducted while information is shared among related parties via the platform, this would reduce the operational burden for managing the status for matching and improve operational efficiency for investigating the cause of discrepancies.

- ✓ As a more advanced model, if borrowing/lending fees, collateral interest, and dividend equivalent can be calculated in the platform, and only the results need to be matched, this would reduce the number of mismatches and improve operational efficiency. Furthermore, transaction cost is expected to be reduced since each firm does not need to construct its own calculation engine.

- ✓ However, from the perspective of effective utilization, the platform needs to be used by major players in the stock borrowing and lending market. In order to achieve this, we could think of how to provide such a matching function to stock lending DVP participants so that we achieve comprehensive matching for stock borrowing and lending transactions, or how to implement STP for the series of processes from matching to fund settlement of borrowing/lending fees, etc.

- ✓ In addition, for the purpose of improving operational efficiency and encouraging more transactions, we will need to also standardize transactions to a certain extent alongside developing the platform.

3. Future Vision for Operations and IT System in Securities Post-Trade

Approach to future vision for improving operational and IT system efficiency by utilizing an information sharing platform

- We recognized that each use case involves inefficiency and operational risk due to the fact that there are many counterparties for sharing information, that different means of communication (e-mail, fax, etc.) are used depending on the counterparty, and that different file formats, including forms and items, are used depending on the counterparty.
- We also understood that these issues could be resolved by utilizing an information sharing platform as an infrastructure for comprehensive securities post-trade information.

Image of current securities post-trade operations

Image of securities post-trade operations that utilizes an information sharing platform

Information Sharing Platform
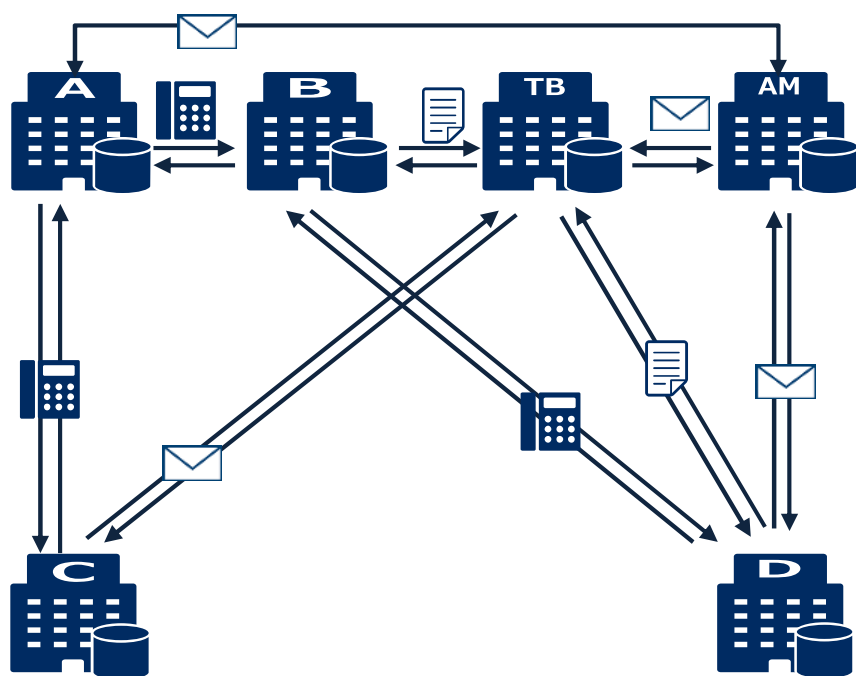
Much communication and sharing of data among related parties (internal/external) is conducted via e-mail, phone, and fax, and is followed by additional operations, including manually inputting information into in-house systems, which is complicated and incurs operational risk. In addition, these involve various formats and items.
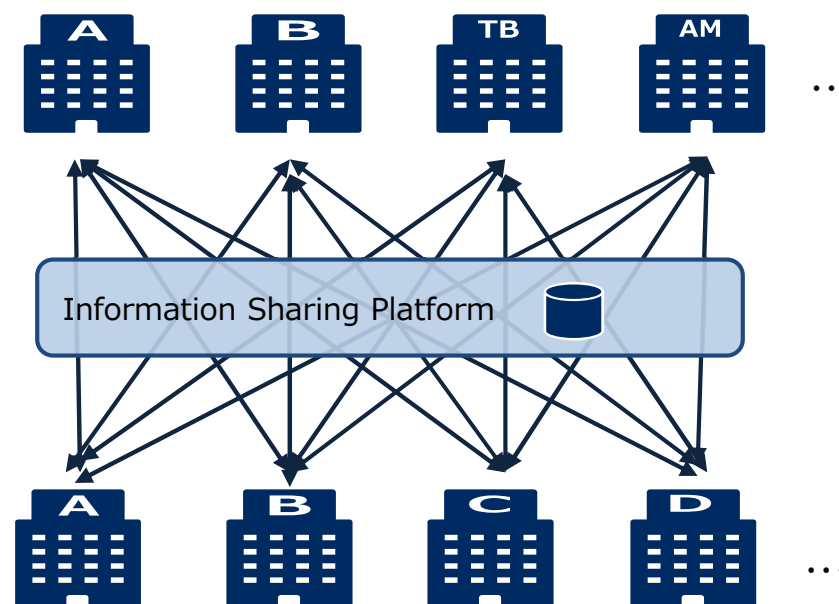
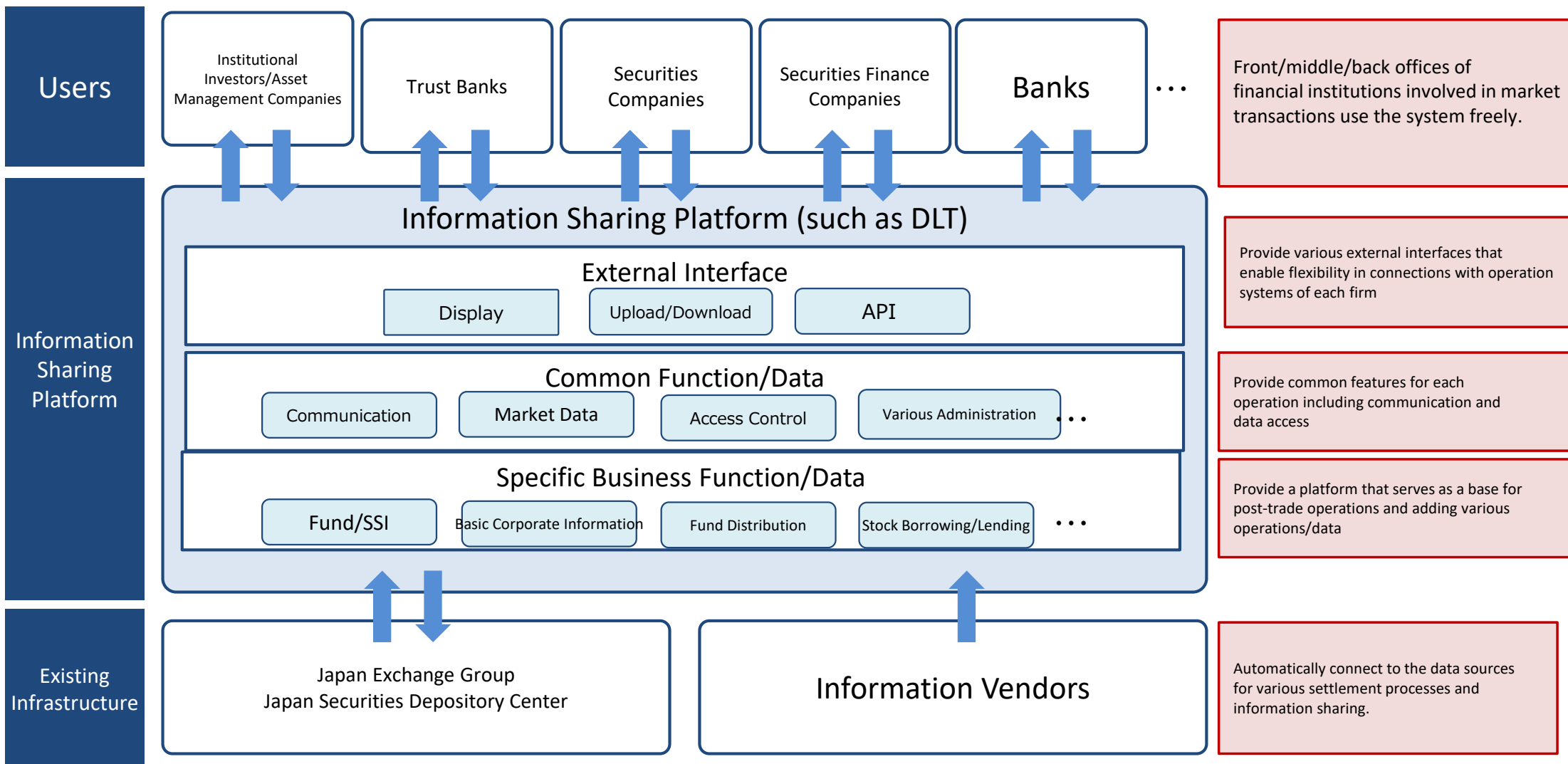Communicating and consolidating information via an information sharing platform will improve operational efficiency and reduce operational risk. In addition, utilizing a common infrastructure could also lead to standardization of formats, items, and rules.

Example of future vision for improving operational and IT system efficiency by utilizing an information sharing platform

- The diagram below is an example of a future vision that utilizes an information sharing platform.
- In addition, the platform can be positioned as a base for post-trade operations that can be enhanced in phases by adding operations and systems and can flexibly accommodate future changes.

Users

| Institutional Investors/Asset Management Companies | Trust Banks | Securities Companies | Securities Finance Companies | Banks | ... |

Front/middle/back offices of financial institutions involved in market transactions use the system freely.

Information Sharing Platform

Information Sharing Platform (such as DLT)

External Interface

- Display
- Upload/Download
- API

Provide various external interfaces that enable flexibility in connections with operation systems of each firm

Common Function/Data

- Communication
- Market Data
- Access Control
- Various Administration ...

Provide common features for each operation including communication and data access

Specific Business Function/Data

- Fund/SSI
- Basic Corporate Information
- Fund Distribution
- Stock Borrowing/Lending ...

Provide a platform that serves as a base for post-trade operations and adding various operations/data

Existing Infrastructure

| Japan Exchange Group Japan Securities Depository Center | Information Vendors |

Automatically connect to the data sources for various settlement processes and information sharing.

B-POST project : Japan Exchange Group, Inc. Japan Securities Depository Center, Inc. NEC Corporation

15

Approach to improving operational and IT system efficiency by utilizing an information sharing platform

- While it is possible to resolve the issues of inefficiency in securities post-trade by applying specific alternative means in each use case without an information sharing platform, the advantages of utilizing an information sharing platform are as follows.
- In addition, it is important to work toward resolving such issues while considering the efficiency for the overall industry based on a long-term perspective.

Improving efficiency of information sharing/communication

➢ By bringing transaction related information and market data onto a DLT platform, and having the related parties communicate accordingly, we could reduce the dependency on e-mail, telephone, and fax, and this will improve operational efficiency and reduce operational risk.

➢ For example, by centrally managing fund information, the necessary information, such as trade matching/settlement, and fund distribution, can be shared in a timely manner among each related party without imposing large operational burden even at the time of fund establishment, redemption, and change in attribute.

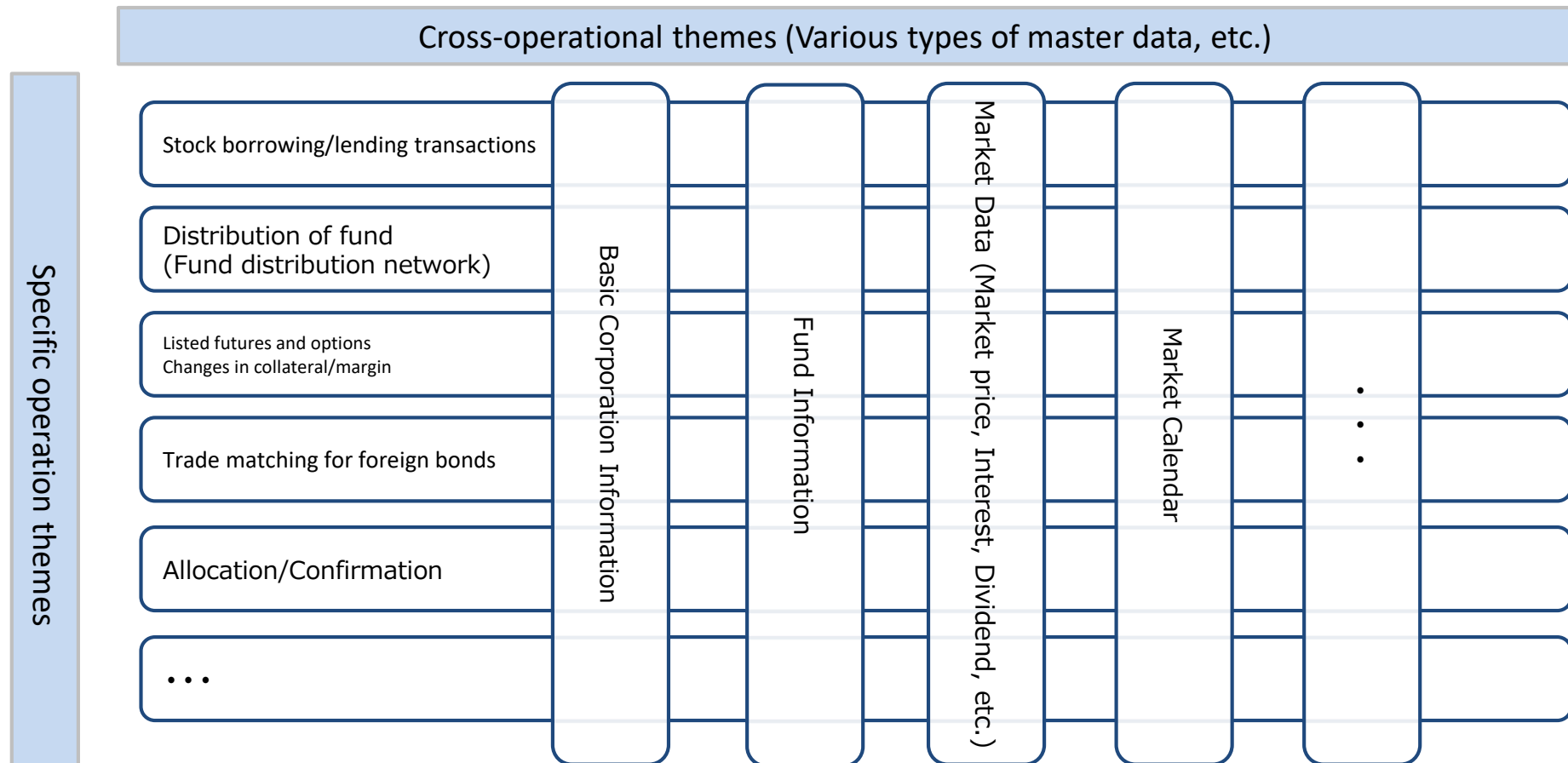## Promoting standardization of operations through the use of a sharing platform

➢ Since transaction pattern and information sharing format will be standardized by conducting operations through a common platform, there will be less specific treatment for each case, and this will improve operational efficiency and reduce cost.

Absorbing operational differences across the different firms by open architecture

➢ By constructing a framework that enables information that has been consolidated to be shared flexibly among related party systems based on access permissions and security measures, the information can be shared while absorbing the operational differences across the different firms, and this will lead to improved operational efficiency. In addition, for themes that are particularly suited to DLT, we can expand the framework's features by leveraging the openness and flexibility of DLT.

Approach to themes for resolving issues by utilizing an information sharing platform

- The diagram below illustrates the approach to themes for resolving issues in the information sharing platform.
- Since it may include both specific and cross-operational themes, we have to consider them using a multi-themed approach.

Cross-operational themes (Various types of master data, etc.)

Specific operation themes

- Stock borrowing/lending transactions
- Distribution of fund (Fund distribution network)
- Listed futures and options Changes in collateral/margin
- Trade matching for foreign bonds
- Allocation/Confirmation
- …

Basic Corporation Information

Fund Information

Market Data (Market price, Interest, Dividend, etc.)

Market Calendar
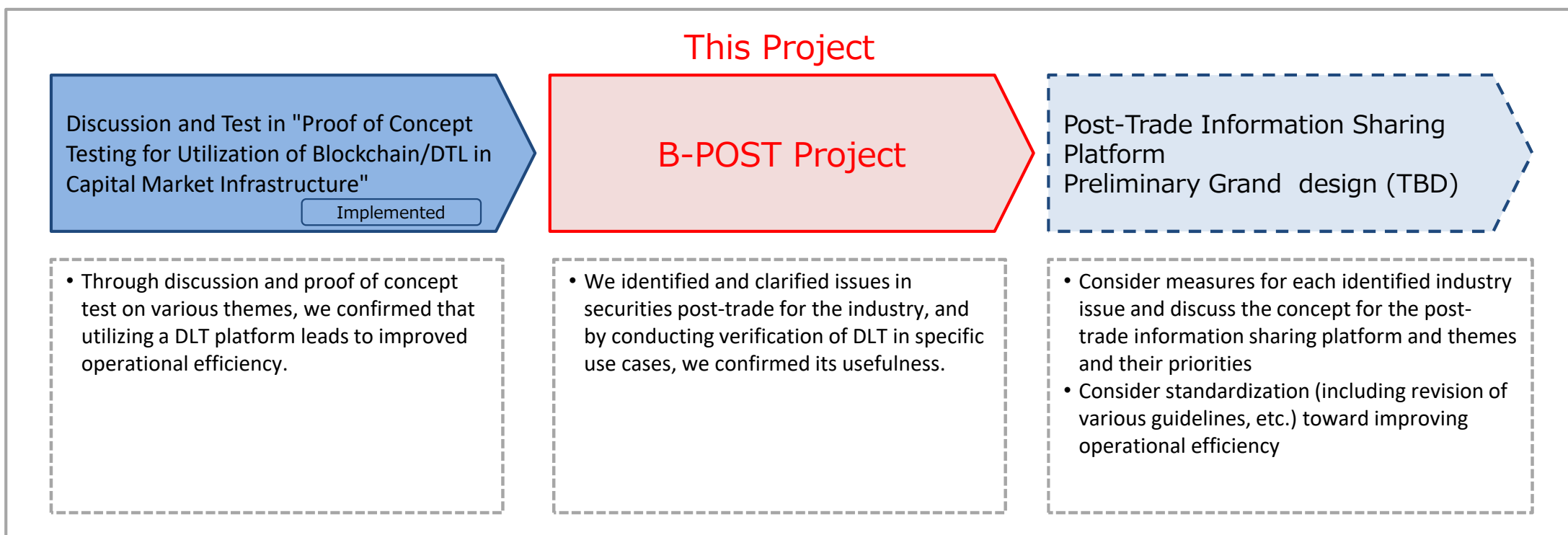
<Example of multi-themed approach>
Numbering standardized fund code for identifying the trading products and linking them with existing codes in matching of borrowing/lending fee, collateral interest and dividend equivalent amount of stock borrowing/lending transactions.

Approach to examining the utilization of an information sharing platform

- In "Proof of Concept Testing for Utilization of Blockchain/DTL in Capital Market Infrastructure", we have verified that operational efficiency can be improved by DLT, and in this B-Post project, we have again identified the issues in securities post-trade and have tested them in specific use cases.
- As a next step, in response to each identified issue in securities post-trade, we will consider the future vision of the information sharing platform and steps we need to implement it while standardizing for the issues. Regarding DLT technology, we will continue to verify its effectiveness.

Approach to Future Discussions (TBD)

This Project

Discussion and Test in "Proof of Concept Testing for Utilization of Blockchain/DTL in Capital Market Infrastructure" Implemented	B-POST Project	Post-Trade Information Sharing Platform Preliminary Grand design (TBD)
• Through discussion and proof of concept test on various themes, we confirmed that utilizing a DLT platform leads to improved operational efficiency.	• We identified and clarified issues in securities post-trade for the industry, and by conducting verification of DLT in specific use cases, we confirmed its usefulness.	• Consider measures for each identified industry issue and discuss the concept for the post-trade information sharing platform and themes and their priorities • Consider standardization (including revision of various guidelines, etc.) toward improving operational efficiency

Disclaimer

- While every effort is taken to ensure the accuracy of the information contained in this document, it is based on the information at the time of publication, and we do not guarantee its completeness, accuracy, applicability nor usefulness.

- Any decision based on the information provided in this document shall be made on the responsibility of the user, and the project including its related parties shall bear no responsibilities/liabilities whatsoever for any related matters.