# 28th ASEAN+3 Bond Market Forum (ABMF) Meeting and Relevant Meetings

18-21 June 2018 / Seinan Gakuin University, Fukuoka City, Japan

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**DAY 1 – 18 JUNE 2018**

**Venue: Multi-Purpose Hall, 1st Floor, Centennial Hall**

## How financial innovation can link and integrate Asia?

Emerging financial innovation to support intraregional trade and investments: business application in Japan and Asia

Jointly Hosted by APEC Business Advisory Council/Asia Pacific Financial Forum, Kyushu University, and ADB

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<th>TIME</th>
<th>PROGRAM</th>
<th>DETAILS</th>
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<tr>
<td>08:30 – 09:00</td>
<td>Registration</td>
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<tr>
<td>09:00 – 09:15</td>
<td>Welcome Remarks by Mr. Yutaka Aso, Chairperson of Fukuoka Directive Council, Chairperson of Kyushu Economic Federation / Chairman of ASO Cement Co., Ltd.</td>
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<tr>
<td>09:30 – 09:50</td>
<td>Keynote Address: How can Fintech be harnessed by regulators?</td>
<td>by Mr. Motonobu Matsuo, Deputy Director-General, FSA</td>
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<td>09:50 – 10:20</td>
<td>Session 1: Fintech and financial service in global context</td>
<td>by Mr. Chikahisa Sumi, Director, Regional Office for Asia and the Pacific, IMF - How technology is changing financial landscape? - How technology can support developments?</td>
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<td>10:20 – 10:50</td>
<td>Session 2: How financial innovation can link and integrate Asia?</td>
<td>by Mr. Satoru Yamadera, Principal Financial Sector Specialist, ADB - Asia is moving from manufacturing base to consumer markets - Dynamics of convergence and divergence in the region - How financial innovation can help integrating Asia?</td>
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<tr>
<td>10:50 – 11:05</td>
<td>Coffee Break</td>
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<td>11:05 – 12:10</td>
<td>Session 3: Crypto-currency: How real? How useful?</td>
<td>Crypto-currency and Exchange (30 min): - What is its function? What went wrong? What has improved? by Mr. So Saito, Representative Lawyer, So Law Office and Legal Advisor to Blockchain Association - Can central bank issue a crypto-currency? (30 min) - Distributed Ledger technology (DLT) to support issuance by Mr. Kazumasa Miyazawa, COO, Soramitsu Q&amp;A moderated by ADB (10 min)</td>
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<tr>
<td>Time</td>
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<td>12:10 – 12:45</td>
<td><strong>Session 4: Fintech and Trade and Supply Chain Finance</strong>&lt;br&gt;- DLT to support trade finance&lt;br&gt;- by Dr. Julius Caesar Parreñas, Coordinator, Asia-Pacific Financial Forum (APFF) and Senior Advisor, Mizuho Bank Ltd.&lt;br&gt;- Mr. Thomas Olsen, Partner, Bain &amp; Company&lt;br&gt;- Mr. Boon-Hiong Chan, Director, Head of Business Control Unit &amp; Market Advocacy, APAC, Deutsche Bank</td>
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<td>12:45 – 14:00</td>
<td>Lunch <em>(Reception Hall, Seinan Community Center)</em></td>
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<td>14:00 – 14:40</td>
<td><strong>Session 5: Finance without collateral: building trust with technology</strong>&lt;br&gt;- Auto finance without collateral: case study in the Philippines&lt;br&gt;- by Mr. Kazumasa Nakashima, Executive Officer, Global Mobility Service Inc.</td>
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<td>14:40 – 15:20</td>
<td><strong>Session 6: Open Application Programming Interface to improve banking service</strong>&lt;br&gt;- Case studies in Japan and possible cross-border application&lt;br&gt;- Financial service and application of artificial Intelligence&lt;br&gt;- By Mr. Junichi Kanda, Executive Officer, Money Forward Inc.</td>
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<tr>
<td>15:20 – 15:40</td>
<td>Coffee Break</td>
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<td>15:40 – 16:50</td>
<td><strong>Session 7: Panel Discussion: Technologies beyond borders. How can harness new technologies to integrate Asia?</strong>&lt;br&gt;- Changes in financial landscape: impact of Fintech and Artificial Intelligence&lt;br&gt;- Technologies beyond borders: impact on Asia and challenges&lt;br&gt;- What is necessary to harness the technologies? What is the role of regulators?&lt;br&gt;- What is the role of standardization?&lt;br&gt;- Practical implementation challenges in emerging markets&lt;br&gt;<strong>Panelist:</strong>&lt;br&gt;- Ms. Karla McKenna. Chair of ISO/TC 68 Financial Services, International Organization for Standardization (ISO)&lt;br&gt;- Mr. John Turner, CEO, XBRL International&lt;br&gt;- Mr. J. C. Parenas, APEC Business Advisory Council/Asia-Pacific Financial Forum&lt;br&gt;- Mr. Kazumasa Nakashima, Global Mobility Service Inc.&lt;br&gt;- Mr. Junichi Kanda, Money Forward&lt;br&gt;- Ms. Julia Walker, Head of Market Development, Risk and Regtech, Asia-Pacific, Thomson Reuters&lt;br&gt;<strong>Moderator:</strong> ADB&lt;br&gt;<strong>Q&amp;A</strong></td>
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<tr>
<td>16:50 – 17:00</td>
<td>Closing Remarks by ADB</td>
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Japanese Fintech Policy
-promote innovation and consumer protection

Motonobu Matsuo
Deputy Director-General
Planning and Coordination Bureau
Financial Services Agency (FSA) of Japan

* Views are the speaker’s and not necessarily identical to those of the FSA.
1. Nature of ongoing changes?

**Current Environment**
- Accumulation of **limited** customer information
- Bespoke services limited to high net worth individuals and large corporations
- One-size-fits-all products driven by supply-side logic
  
**B2C BUSINESS MODELS**

**Ongoing Changes**
- Automatic accumulation of customer **life-logs**
- AI capability for big data analysis and deep learning

**Future**
- Accumulation of **detailed** customer information
- Bespoke services available for all
- Creating shared values based on customer information
  
**C2B BUSINESS MODELS**

- What are your thoughts on the likelihood of such a transition?
- What other changes are occurring, or are likely to occur?
2. Shared value created with FinTech?

**B2C BUSINESS MODELS**

- Offer only limited financial products
- Rely on entry-point analysis and, due to moral hazard and information asymmetry, serve narrower range of customers at higher interest/premium/fees
- No advice or incentive provided to attain better customer lifestyle/business operation.

**C2B BUSINESS MODELS**

- Offer combination of financial and non-financial services
- Rely on ongoing monitoring, attain more accurate assessments of customer conditions and serve wider range of customers at lower interest/premium/fees
- Provide advice and incentives for better lifestyle/business operation.

- What do you think about the possibilities of creating values with FinTech?
- What other values can FinTech create?
3. Key players – Would infrastructure continue to protect incumbents?

Full-line business model

- Low-profit businesses offered for the sake of product line-up
- High-profit businesses with capital-intensive entry barrier

Decentralized, substituted and made more cost efficient by smartphones and blockchain

Past sources of strength turned into generic conduit and legacy assets

Price destruction by entry of mono-line providers

Overall profitability secured through full product line-up

Branch networks, IT systems and balance sheets work as source of strength

Cross-border payment
Alternatives to credit card
P2P

Mono-line business model

Low-profit businesses offered for the sake of product line-up

High-profit businesses with capital-intensive entry barrier

3. Key players – Would infrastructure continue to protect incumbents?
What are your expectations on the future shape of financial networks?
- What will be the factors determining the direction of change in the networks?
Regulators should be guided by their ultimate goal of best promoting national welfare by contributing to the sustainable growth of the national economy and wealth.

5. What should regulators aim for?

- Growth of players who can create shared values and win customer confidence
- Prepare environment and eliminate obstacles in a forward-looking manner
- Customer protection
- Take timely and adequate measures
- Business strategy with foresight to cope with legacy assets
- Encourage banks to direct their businesses with foresight, not protective “convoy policy”

- What are your thoughts on the above elements?
- What other perspectives should be considered?
Based on the growth of FinTech innovation, regulatory framework is partially amended to adapt underlying Fintech environment, while consumer protection is properly ensured.

- Amended the Banking Act and Payment Services Act, etc. (May 2016)
  - Enable and facilitate financial group firms to invest in finance-related IT start-up companies
  - Establish a registration requirement for virtual currency exchangers

- The Act to partially amend the Banking Act (May 2017)
  - Facilitate open innovation between financial institutions and FinTech firms by utilizing open API architecture, while user protection is properly ensured.
International key component for countermeasures against money laundering and terrorism financing

- **G7 Elmau Summit Leaders’ Declaration (June 8, 2015)**
  “We will take further actions to ensure greater transparency of all financial flows, including through an appropriate regulation of virtual currencies and other new payment methods.”

- **FATF (Financial Action Task Force) Guidance (June 26, 2015)**
  “Countries should impose a registration or license system on exchanges that exchange virtual currency and legal currency, as well as imposing money laundering and terrorism financing regulations such as identity verification of the customers.”

Occurrences of bankruptcy incidents at exchanges

- Excessive liabilities
- The held funds or bitcoins are far less than the deposited funds and bitcoins by users
- In addition, generally, potential risks of damages to users due to lack of information, and leakage of user information

Regarding exchanges which exchange, etc. virtual currencies for legal currencies, it is believed an institutional framework should be established from the viewpoint of regulating money laundering and the funding of terrorism, and the protection of users.

Institutional framework proposed by the report

### Money laundering, terrorism funding regulations
- User Identity verification obligation (when opening an account, etc.)
- Production and storage of user identity verification and transaction records
- Reporting of suspicious transactions to the authorities
- System establishment (establishment of company regulations, implementation of training, appointment of supervisors)

### Regulations for user protection
- Introduction of registration system
- Measures for user protection (information provision, internal management, etc.)
- Separate management of cash & virtual currency
- Financial regulations
- External audit (separate management, financial statements)

- Information safety management (security measures, etc.)
- Production and storage of books and documents, provision of business reports
- Supervisory measures (requirement of reports, inspections, business improvement / stop orders, registration revocation)
- Development of financial ADR systems
- Development of systems concerning voluntary regulations, etc.
Measures taken for Virtual Currencies (VC)

- AML/CFT perspective
  - Customer identification/verification
  - Creation and preservation of customer verification and transaction records
  - Reporting of suspicious transactions to the competent authorities etc.

- Protection of customer confidence
  - Explanation and provision of information to customers (characteristics of VCs, their services, etc.)
  - Capital requirements (minimum capital, minimum net assets)
  - Segregation of their funds/VCs and those of their customers, etc.

Introduced registration system for VC exchangers that exchange VCs and fiat currencies
Amendment to the Banking Act
(passed on 26 May 2017 / promulgated on 2 June 2017)

After implementation (amendment)

Customer application for services provided by FIs

- Customer

  - Entrust
    - FinTech firm
      - (Electronic payment service provider)
      - Connect to systems safely
        - Introduce the registration system
        - Manage information appropriately
        - Develop the operation management system for proper governance, etc.
        - Facilitate open innovation betw. FinTech firms and banks
        - Disclose criteria relating to connecting with FinTech companies
        - Develop and publish a rule of sharing responsibility between both parties if customers incur losses

- Financial institution (FIs)

Open API:
- Publicly available application programming interface, creating an environment in which a wide range of FinTech companies can connect to financial institutions' systems while ensuring the information security of customers
- Instruct payments/remittance
- Obtain account information, etc.

- Customer application for services provided by FIs
  - Electronic fund transfer service
  - Account management service

- No use of customer's password etc. – free of scraping
Changes in the circumstances surrounding the financial system

- Development of information technology (IT) has encouraged unbundling of financial services and rebundling of multiple services
- Shadow banking—credit intermediation involving entities and activities outside the regular banking system—is globally on the rise
- As the financial landscape changes, many financial institutions are working to reconstruct their business models—should regulations exist which may have the unintended consequences of impeding reasonable efforts, such regulations will need to be modified
- The emergence of digital currencies and their practical use in the future may bring about a drastic change to the financial system

Current financial regulations—features and issues

1. Most financial regulations have been based on types of entities (i.e. banking, securities and insurance sectors). If the sectors of the entities in question are different, applicable regulations will be different even if the functions and risks associated with their activities are similar.
   - This could undermine the provision of new services spanning several sectors
   - This could allow entities to circumvent financial regulations (regulatory arbitrage)
2. Common fundamental concepts and rules in the financial field are not fully established
   - When a basic concept such as “money” changes, respective sector-specific regulations need to be modified
3. Respective sector-specific regulations could contain provisions not reflecting changes including the development of IT
   - This could impede streamlining of the financial businesses taking advantage of the development of IT

Points to consider

1. Apply the same regulations to the activities with the same functions and risks
   - Financial functions could be categorized into “Payment and Settlement,” “Lending,” “Investment,” “Risk transfer,” etc. and regulations should apply according to the functions and risks associated with the activities
2. Adopt cross-sectoral common fundamental concepts and rules in the financial field
   - Common definitions in the financial regulations should be adopted
3. Consider cross-sectoral review of the financial regulations to accommodate changes in the circumstances surrounding the financial system
• “FinTech Support Desk” (established in Dec 2015)
  - Works as a one-stop contact channel for FinTech businesses
  - Answers FinTech startups’ inquiries within 5 working days on average
  - Received 222 inquiries since its inception till end-June 2017, 12 inquiries per month on average
“FinTech Support Desk” (consultation desk) (established in Dec. 2015)
- Work as a one-stop contact channel for FinTech businesses
- Answer FinTech startups’ queries within 5 working days (on average)
- Received 222 inquiries since its inception till end-June 2017 (12 inquiries per month on average)

“FinTech PoC Hub” (innovation hub) [established in Sep. 2017]
- Aim to support innovative projects that lead to user convenience and/or productivity of companies in Japan.
- For each selected proof-of-concept (PoC) project the FSA will set up a special working team, in cooperation with relevant authorities as necessary.
- A special working team will continually support a project by giving advice on issues related to compliance and supervision etc., that participants of a PoC project would like to clarify.
Outline of Presentation

1. FinTech for Sustainable and Inclusive Growth
2. Risks Associated with FinTech
3. Conclusions and Policy Messages
FinTech for Sustainable and Inclusive Growth
How FinTech could Change the World – Potential Benefits

Blog by Managing Director Christine Lagarde
“An Even-handed Approach to Crypto-Assets”
(April 16, 2018)

Fast, Inexpensive Financial Transactions

• Crypto-assets enable fast and inexpensive financial transactions, while offering some of the convenience of cash
• DLT could help financial markets function more efficiently

A Better Balance and Diversification

• A better balance between centralized and de-centralized service providers
• Diversification of the financial landscape
• A financial ecosystem that is more efficient and potentially more robust in resisting threats
IMF’s Role in FinTech

• “It is our job to monitor the economies and financial systems of our 189 members, help them build institutional capacity, and offer advice on improving policies and regulatory structures.”

• “We must guard against emerging risks without stifling innovation...
  ...We shouldn’t put off action until the answers become completely clear. Instead, we must begin to consider the regulatory framework of the future.”
FinTech could support the economy through enhanced Financial Inclusion.
Financial Inclusion is Progressing Rapidly and Globally

2 Billion Remain Unbanked, Concentrated in Asia

**SHARE OF THE WORLD'S UNBANKED ADULTS BY REGION (2015)**

- **East Asia & Pacific**: 25%
- **South Asia**: 32%
- **Sub-Saharan Africa**: 17%
- **Latin America & Caribbean**: 10%
- **Europe & Central Asia**: 5%
- **Middle East**: 4%
- **High-income OECD economies**: 3%
- **Other economies**: 4%
- **High-income OECD economies**: 3%
- **Other economies**: 4%

Financial Inclusion Arc

Technology Supports Inclusion

FinTech’s Broader Implications for Payments

Current
*Account-based*

- Involve the transfer of a claim on balances recorded in an account maintained with an intermediary

Future?
*Token- or Value- based*

- Involve the transfer of a payments object

The two-systems differ in:
- Identification requirements (counterparty vs. object)
- Verification mechanism (centralized vs. decentralized)
Payment Optimization through the Usage of DLT

<table>
<thead>
<tr>
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<th>Current International Payment (e.g. Japan → US)</th>
<th>New Payment (e.g. Ripple)</th>
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<tbody>
<tr>
<td>Time</td>
<td>3-5 days</td>
<td>Instant, On-Demand</td>
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<tr>
<td>Transmission Fee</td>
<td>20-65 USD per transmission</td>
<td>?</td>
</tr>
<tr>
<td>FX Margin</td>
<td>0.7-2.5 percent</td>
<td>?</td>
</tr>
<tr>
<td>Relationship with Correspondent Bank</td>
<td>Fixed</td>
<td>Optimized</td>
</tr>
<tr>
<td>Text/Information Accompanied with the Transfer</td>
<td>SWIFT</td>
<td>API-based messaging module</td>
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### Estimated Total Cost per Payment

- **Today**: USD 5.56
- **Ripple**: USD 2.21

Source: Ripple

![Bar chart showing cost comparison between traditional and new payment methods.](chart.png)
FinTech Financing is Accelerating...

Nearly US$100 billion has flowed into fintech ventures since 2010.


Source: Accenture Research analysis of CB Insights data
Lending and Payments are the Leading Areas

Most fintech investments went to lending, payments and insurance technologies in 2017.


Source: Accenture Research analysis of CB Insights data
FinTech Investment remains still small compared to the size of overall IT Expenditures

Source: Accenture
Introduction of Central Bank Digital Currencies

- Balance of benefits and costs is still being analyzed
- Resolving coordination problems between private networks
- Reducing the risk of single point of failures
- Retaining control of monetary policy

Outstanding Issues
Risks Associated with FinTech... and Ways to Mitigate the Risks
How FinTech could Change the World – Potential Risks

Blog by Managing Director Christine Lagarde
“Addressing the Dark Side of the Crypto-World”
(March 13, 2018)

New Vehicle for Money Laundering and the Financing of Terrorism

• Crypto-asset transactions are given an element of anonymity
• e.g. At AlphaBay, the largest online criminal marketplace, more than $1 billion had been exchanged through crypto-assets before the site was taken offline

New Vulnerabilities

• The extreme volatility in the crypto-assets’ traded prices
• The crypto-assets’ ill-defined connections to the traditional world
### How could FinTech Reshape the Landscape?

Three Distributed Ledger Technology (DLT)-based scenarios

<table>
<thead>
<tr>
<th>Back-end processes</th>
<th>Compliance</th>
<th>Means of payment (Crypto-Assets)</th>
</tr>
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<tbody>
<tr>
<td>• Efficiency gains from payments tracking, accounts reconciliation, and liquidity optimization</td>
<td>• Large savings from compliance costs with information sharing (Know-Your-Customer utilities and digital identities)</td>
<td>• New networks enable faster, traceable, and low-cost payments</td>
</tr>
<tr>
<td>• Small impact</td>
<td>• Some impact with new entrants</td>
<td>• Central Bank Digital Currencies bring trust, stable FX rates, and interoperability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Significant impact</td>
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Potential Disruption
Use of emerging technologies to facilitate regulatory compliance (RegTech)

- Automate manual process (e.g. artificial intelligence)
- Facilitate regulator-bank interactions (e.g. APIs)
- Identify suspicious transactions (e.g. biometrics, big data)
- Share and store data (e.g. cloud-computing, DLT)
- Enhance security (e.g. cryptography)
Crypto-Assets as Money

• Legal perspectives
  ➢ The power of the state to regulate the monetary system
  ➢ The concept of “legal tender”
  ➢ The legal status reinforces or reduces the network effect of incumbent currencies
  ➢ But the law cannot be divorced from the economics

• Economic perspectives
  ➢ Store of value; medium of exchange; unit of account
  ➢ What determines the value: investor/user “beliefs” or “expectations”
  ➢ Track record helps anchor such beliefs: gold, or well-established fiat currencies
Questions to Address

1. Will crypto-assets play fuller functions of money?

2. What are the implications for payments and the creation of money?

3. Will monetary policy remain effective in a world populated with crypto-assets?

4. How should central banks respond?
Traded Volume by Fiat Currency

Bitcoin: Reported Volumes by Fiat Currency
(Volume, BTC in millions)

Bitcoin Value
(Bitcoin per USD)

Source: Bitcoinity.org
Comparisons with Historical Bubbles

Source: IMF
Realized Volatility

Source: IMF
Will Valuation Become More Stable?

- Academic research* shows that over time, the exchange rates of crypto-assets may become less sensitive to the impact of shocks to speculators’ beliefs.

- "Stable coins" are being created
  - Valuation pegged to existing well-established fiat currencies

- "Algorithmic central banking" coins are also being designed
  - Issue is regulated by voting of network participants: democratization of monetary policy?

Note: e.g. Bolt and van Oordt 2016
Risk-Adjusted Returns (Sharpe Ratio)

Annualized Sharpe Ratio of the Selected Asset Classes
Conclusions and Policy Messages
Key Findings

- Boundaries are blurring between intermediaries, markets and new service providers
- Barriers to entry are changing
- Technologies may improve cross-border payments
# Implications of FinTech

- Regulators may need to complement their focus on entities with increasing attention to activities
- Need for greater international harmonization between regulatory frameworks
- Governance needs to be strengthened
- Policy options to support open networks could be considered
- Legal principles need to be modernized
Regulatory Challenges

- More focus on activities-based?
- How to achieve in an open network?
- Legal status of digital tokens
- Settlement finality
- Self governance vs. regulation
- More focus on activities-based vs. entities-based
- Algorithmic governance
- Ownership and contractual rights
- Privacy vs. transparency
- Legal status of digital tokens
- Settlement finality
## Regulatory sandboxes

<table>
<thead>
<tr>
<th>Objective</th>
<th>Regulations</th>
<th>Safeguards</th>
</tr>
</thead>
</table>
| • Strike a balance between promoting innovation and preserving financial stability and consumer protection | • Certain regulatory requirements can be relaxed.  
• More jurisdictions exclude certain regulations that cannot be waived (e.g. AML/CFT) | • Safeguards to mitigate risks (e.g. number and type of customers, duration, consumer protection measures) |
Policy Messages

• FinTech should be included as part of financial inclusion strategies with focus on closing digital/inclusion divides
• Need right balance for FinTech regulations between innovation and stability
• Synergies between technology infrastructure and financial inclusion are important
• Encourage “social experiment” in pursuing financial inclusion
• Better and broader data on financial inclusion, including FinTech activities, should be build
How financial innovation can link and integrate Asia?

Satoru Yamadera
Principal Financial Sector Specialist, ERCD, ADB

ABMF Conference: How financial innovation can link and integrate Asia?
18 June 2018 in Fukuoka, Japan
• Asia: from Production Base to Consumer Markets

• How financial innovation can link and integrate Asia?

• Outline of the conference
Asia: from Production Base to Consumer markets
Asia in Global trade
The share of Asia is more than 1/3, larger than US and Euro Area

Note: Weights are based on gross national income in current US dollars, Atlas method.
From a factory of the world to consumer markets of the world

Though interregional trades of East Asia has been comparable with EU, most of final goods had been exported to the US and Europe. But now the No.1 destination of consumption goods is Asia.

Share of ASEAN+3's Consumption goods Exports by Destination

資料: ADB
The shares of China and ASEAN are increasing while the share of Japan is declining.
Increasing growth of China and ASEAN

GDP at PPPs (in constant 2016) $Bn

Source: PWC. 2017. The long view: how will the global economic order change by 2050?
ASEAN is rapidly catching up GDP(PPP) per Capita and Japan’s Growth

Source: ASEAN-Japan Center. 2017. ASEAN Information Map
Share of intra-regional baking is also increasing

International claims on emerging Asia-Pacific USD bn

- Asia-Pacific banks
- US banks
- UK banks
- Swiss banks
- Euro area banks
- Other reporting banks
Growing but diversified Asia

Human Development Index


Source: ASEAN-Japan Center. 2017. ASEAN Information Map
Asia: Opportunities and Challenges

• East Asia is rapidly growing.
  – Global economic center is shifting to Asia.

• The region needs to be more integrated to continue the growth.
  – TPP, RCEP, ASEAN Economic Community to expand the markets.

• However, Asia is heterogenous.
  – Different levels of economic development
  – Different currencies and economic policies
  – Languages
  – Culture and Religions
  – Social and legal frameworks
How financial innovation can link and integrate Asia?
Technologies to overcome the challenges

(Economic variance)
• Wider different level of economic developments
• Different currencies and economic policies

Technologies to change conventional ways of finance
• More efficient payment systems
• Better access to finance

(Social and cultural variance)
• Languages
• Social and legal frameworks
• Culture and Religions

Accepting the differences but making inter-operable environment with standardization
Sources of working capital in developing Asia, by firm size

Internal funds/Retained earnings
Banks
Nonbank financial institutions
Trade credit
Others

% of firms reporting that financing required collateral

LAC = Latin America and the Caribbean, MENA = Middle East and North Africa, SSA = Sub-Saharan Africa.

Active E-Commerce and M-Commerce Penetration, 2017

% of Total population

Source: AJC compilation, based on We Are Social (2017), https://wearesocial.com/
注：2017年1月現在 /Note: As of January 2017

Source: ASEAN-Japan Center. 2017. ASEAN Information Map
Mobile Cellular subscriptions
High level of mobile phone usage can be a key.

Source: AJC compilation, based on World Bank, World Development Indicators (2017)

Source: ASEAN-Japan Center. 2017. ASEAN Information Map
What is Fintech?

Technologies to improve:
• functions of money
  – Cheaper, more convenient means of payment
• function of banking
  – More efficient matching between borrowers and lenders
  – Evaluating credit-worthiness by non-financial data
• Function of organized markets
  – Wider participants and much faster matching
  – transparency
• Efficiency of business operations
  – Robotic Process Automation
• Exponential growth of data and expansion of network
  – Physical form to digital data
• Advanced network and dynamic analysis
  – Much faster data analysis
  – Real-time analysis
Technologies to overcome heterogeneous Asia

- Hello
- Magandang umaga po
- Xin chào
- 您(你)好
- สวัสดีครับ
-  привет
- Selamat siang
- こんにちは
- 안녕하십니까

- Technology to support inter-operability in different markets.
- Standardization to support communication

{name}Yamadera, Satoru{/name}
{name}>ヤマデラ サトル{/name}
{name>山寺 智</name>
Standardization as an soft infrastructure to integrate the economies

Standardization needs to be considered as a basic infrastructure to be implemented along with economic developments.

Source: http://5stardata.info/
Standardization in Asia

- Standardization can be considered at global, regional and national level.

![Diagram showing levels of standardization: International Standards and practices, Regional standards and practices, Local standards and practices.](image-url)
ASEAN+3 regional cooperation and Asian Bond Markets Initiatives (ABMI)

• Lessons from the Asian Currency Crisis.
• ABMI to mitigate currency and maturity mismatch.
• Better utilization of Asian savings for Asian investments.
• Financial stability by creating multiple channels of financing.
Institutional Framework of ASAEN+3 financial cooperation

Finance Ministers and Central Bank Governors Meeting

Deputy Ministers and Deputy Governors Meeting

CMIM*
Regional safety net

ADB as the Secretariat

ABMI
Asian Bond Market Initiative

ASEAN+3 Macroeconomic Research Office (AMRO)

TF 1
(Supply)

TF 2
(Demand)

TF 3
_Regulation_

TF 4
(Infra.)

Promoting LCY bond markets to address the double mismatch problem

Credit Guarantee and Investment Facility (CGIF)

Asian Bonds Online
Asian Bond Monitor

ASEAN+3 Bond Market Forum (ABMF)

Sub-forum 1
AMBIF

Sub-forum 2
ISO STP

Infrastructure Finance (including Hosing finance)

Lao-Thai bonds

Cross-border settlement Infrastructure Forum (CSIF)
ASEAN+3 Bond Market Forum as an enabler of market integration

- ABMF is the only regional platform to discuss various issues among Private and Public sector experts.
Outline of the conference
Emerging financial innovation to support intraregional trade and investments

Business application in Japan and Asia

2. Fintech and Trade and Supply Chain Finance
3. Finance without collateral: building trust with technology
4. Open Application Programming Interface to improve banking service
5. Panel discussion
Thank you

syamadera@adb.org
Role of Crypto-currency Exchange and Japanese VC Act

SO SAITO
FOUNDER AND REPRESENTATIVE LAWYER
SO LAW OFFICE
JUNE 18, 2018
Speaker’s biography

Admitted to the bar in Japan (1999-) and in the State of New York (2005-)

Founder and representative lawyer of So Law Office (2015-)

Legal Advisor to Japan Blockchain Association (JBA) (2014-)

Specialized in Crypto-related law since 2013
Today's lecture content

- The role of the virtual currency (VC) exchanges
- Japanese VC Act and regulations
- Impact on regulations by the Coincheck incident
- Future of Regulation
I  Role of Exchange

There are mainly two type exchanges

(i) Exchange-type exchange (It matches sales and purchase order between users)

(ii) Shop-type exchange (It itself sells and purchases crypto)
Role of Exchange – Exchange-Type Exchange

Exchange type exchanges

- User A
- Exchange
- Intermediate
- User B

Sales and purchase of VC
Role of Exchange – Exchange-Type Exchange

Exchange-Type exchange

(i) Keeping users’ fiat and VC under custody
(ii) Matching of buying and selling of VC between users
(iii) Settlement of trading
Role of Exchange – Shop-Type Exchange

Shop-Type Exchange

Exchange <-> User
Sales and purchase of VC
Role of Exchange – Shop-Type Exchange

Shop-Type Exchange

(i) shop itself becomes a counterparty and trades with users
(ii) Often keep users’ fiat and VC in custody
Role of Exchange - Differences

Differences between Two Types

(Exchange-Type)
- Matching
- Fee is cheaper / More volume

(Shop-Type)
- Direct sale
- More user-friendly (easier to use)
- More alt-coins in Japan
Role of Exchange – Outside of Blockchain

Exchanges are outside of blockchain

Hacking to exchange is not a fault of Bitcoin system

However, exchanges play an important role in crypto industry

• Most users use exchanges and keep their VC in exchanges
• Criminal use exchanges for money-laundering
Risk of Exchange

Hacking risk

Money laundering risk

Regulators want to regulate exchanges
Japanese Virtual Currency Act

The VC Act was enacted in April ‘16 and is enforced in April ‘17

Introducing "registration system"
Japanese Virtual Currency Act

VC exchanges are required to "register" with JFSA

Obligations: compliance officer, KYC/AML, cyber-security, segregation of exchange’s asset and users’ assets, internal audit, accounting audit, audit on segregation, explanation duty to users, etc.

6 months to 1 year

More than JPY100M cost?
Japanese Virtual Currency Act

16 companies have been registered including bitFlyer, Zaif, QUOINE, GMO Coin, DMM Bitcoin, SBI Virtual Currency

4 companies (including Coincheck) are operating under deemed registration (transitional measures)

More than 100 companies are applying
Market Entrants from Overseas

There are many applicants from overseas

They are from all over the world including the US, Europe, Russia and former Soviet Union, and China
Reasons for entry to Japan Market

Stability of the law
Large trading volume
Bank accounts are relatively easier to open

However, it is in question if the said perceived advantages still remain
Trading Volume of Japanese Exchanges

https://jpbitcoin.com/market/volume
Ⅲ Coincheck incident and afterwards

On January 26, ’18, NEM equivalent of approximately JPY58 billion was hacked from Coincheck

Coincheck kept all NEM in hot wallet
Coincheck incident and afterwards

Coincheck has repaid all stolen loss to its users with JPY (1 NEM=JPY88.5, total 46 billion) from its own asset.
Many were surprised to find the scale of profitability of exchanges.

Monex, a leading online security company, purchased Coincheck.
Coincheck incident and afterwards

The FSA’s Examination after the Coincheck incident

◦ On 1st February, all registered exchanges and deemed registered exchanges were ordered to report on system risks
◦ On-site inspection is being conducted first on Coincheck, thereafter on each registered and deemed registered exchange
◦ Business improvement order, business suspension order, refusal of registration were issued to exchanges
Virtual Currency Act – Review becomes Stricter

Original intention at the time of legislation in ‘16 → Enabling the startups to engage in VC business

Review became stricter in mid 2017 because of surge in VC prices and hardfolk of Bitcoin
  ◦ FSA’s special monitoring team was formed
  ◦ Hundreds of questions are being asked when applying for registration
Virtual Currency Act – Review becomes Stricter

Review becomes far stricter after the Coincheck incidents

Security, Advertisement, Operation, Internal Management, Insider, Anti-money laundering, Market Maneuvering

There are no new exchanges nor new coins admitted since last December
Coincheck incident and afterwards

JFSA Workshop on Virtual Currency Exchange Business (April 2018 -)
  ◦ FSA’s Research group of experts

Japan Virtual Currency Exchange Association (April 2018 -)
  ◦ Established as voluntary self-regulatory organization, but aiming to be legally-mandated SRO. 16 registered exchanges currently join. Scope of self-regulation is being discussed including, security, AML, market manipulation, etc.
IV  ICO Regulation

ICO is abbreviation of “Initial Coin Offering”

Fund-raising by selling so-called “coins” or “tokens”

Still remains global hot topics being followed with growing enthusiasm
In December `17 JFSA revealed its view to relevant parties that ICO tokens constitute, to the extent they have the probability of being listed later, "virtual currency"
ICO Regulation

"Registration of virtual currency exchange business" + "notification of coins" are required for ICO in Japan.

December `17 onwards no ICO was being launched as unequivocally in compliance of the laws.
VI Future Japanese virtual currency exchange industry

The VC Act in Japan was perceived as advanced and forward-looking when published.

A lot has happened in one year thus the act started to lag behind the fast-changing reality.
Future Japanese virtual currency exchange industry

As drafted, the law was meant to promote innovation, but as currently operated it is to further regulate the industry

Balance between innovation and regulation
No conclusion yet, should discuss
Can central banks issue a cryptocurrency?  
Distributed ledger technology (DLT) to support issuance  

Kazumasa Miyazawa, June 2018
Who are we?

**HYPERLEDGER IROHA**

Creator of Hyperledger Iroha and an active member of the Linux Foundation’s Hyperledger Project

**NATIONAL BANK OF CAMBODIA**

We are creating a payment system based on Hyperledger Iroha for the central bank and regulator of the Kingdom of Cambodia

**JBA**

We are a proud member of the Japan Blockchain Association
Credentials

Founded in February 2016
Headquarters in Tokyo, Japan

Website: www.soramitsu.co.jp

2016

Accepted to final round in Sumitomo Mitsui Financial Group’s Mirai Business Contest

Presented at the Bank of Japan about KYC and blockchain

Started work with the University of Tokyo, University of Aizu, and International University of Japan GLOCOM on a joint economics research project using blockchain

Accepted by the Ministry of Economy, Trade, and Industry to the 2016 Hiyaku venture support program

Presented at the Bank of Japan about KYC and blockchain

Presented to the Executives’ Meeting of East Asia Pacific Central Banks about blockchain and the possibilities for central bank digital currencies

2017

Started work with Rakuten Securities on a KYC project using blockchain

Started work with Sompo Holdings on a project to manage weather derivatives on a blockchain

Started work with the National Bank of Cambodia to create a new payment infrastructure using the Hyperledger Iroha blockchain

Accepted by the Ministry of Economy, Trade, and Industry to the 2017 Hiyaku venture support program

Gave a talk about KYC, digital identity, and blockchain to the Institute of International Finance meeting in Tokyo

Accepted by the Ministry of Economy, Trade, and Industry to the 2017 Hiyaku venture support program

Presented to the Executives’ Meeting of East Asia Pacific Central Banks about blockchain and the possibilities for central bank digital currencies
Kazumasa Miyazawa

EDUCATION

(1980) MBA in Management Systems, Tokyo Institute of Technology

WORK EXPERIENCE

(2017 – Present)
Soramitsu (Blockchain development company)

(2016 – Present)
ISO TC307 Blockchain International Standardization Organization: Committee member

(2006 – Present)
Tokyo Institute of Technology: Appointed Professor, Management Systems

(2008 – 2009)
Financial Service Agency (FSA): Financial Council member

(2010 – 2016)
Rakuten Edy Inc. (E-money development & operating company): CSO, Executive Officer

(2001 – 2009)
bitWallet Inc. (E-money development & operating company): Founder, Managing Executive Officer

(1980 – 2000)
Sony corporation: General Manager, IC card division, etc.
Central Bank Digital Currency (CBDC)

In light of the emergence of new technologies like blockchain and DLT, some argue that a central bank should take advantage of these new technologies and issue central bank digital currency (CBDC) as a substitute for banknotes. Others suggest that a central bank should consider applying those technologies for central bank deposits.

Haruhiko Kuroda
Governor of the Bank of Japan
October 4, 2017
(emphasis added)

Central Bank Digital Currency (CBDC)

CBDC means two ways: everyone has an account at the central bank; and tokens (crypto-asset) which can be circulated.

In April 2017, the National Bank of Cambodia and Soramitsu started to create a new payment infrastructure for the Kingdom of Cambodia using blockchain.

First case where overseas central banks adopt Japanese blockchain technology

Evaluated speed of finality and throughput more than 300 times compared with Bitcoin
Issuing a central bank digital currency

1. Distributed ledger technology (DLT) can support RTGS and crypto-currency issuance by central banks

2. A common Asian cryptocurrency concept for foreign exchange settlement among ASEAN+3 countries could create great advantages

3. Private or consortium blockchains are better than Public blockchains for the above purposes
### Public, consortium, and private blockchains

#### Classified blockchain types depending on type of system management

<table>
<thead>
<tr>
<th>Blockchain type</th>
<th>Public</th>
<th>Consortium</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management entity</td>
<td>none</td>
<td>multiple</td>
<td>single</td>
</tr>
<tr>
<td>Participation of validation</td>
<td>Non-permissioned; Malicious actors may participate</td>
<td>Permissioned; Only those permitted can participate</td>
<td></td>
</tr>
<tr>
<td>Approver of transactions</td>
<td>All participants</td>
<td>Only permitted participants</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram showing the classification of blockchain types](image-url)
## Public, consortium, and private blockchains

Consortium, Private blockchains have advantages for finality and transaction speed

<table>
<thead>
<tr>
<th>Blockchain type</th>
<th>Public</th>
<th>Consortium Private</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of server variations</strong></td>
<td>Unlimited, huge</td>
<td>Limited, small</td>
</tr>
<tr>
<td><strong>Consensus algorithm</strong></td>
<td>PoW (Proof of Work), etc.</td>
<td>BFT (Byzantine Fault Tolerance), etc.</td>
</tr>
<tr>
<td><strong>Transaction finality</strong></td>
<td>No Finality</td>
<td>Finality</td>
</tr>
<tr>
<td><strong>Transaction time</strong></td>
<td>Long (10 minutes, etc.)</td>
<td>Short (Few seconds, etc.)</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>Bitcoin, Ethereum, etc.</td>
<td>Hyperledger Iroha, Ripple, Miyabi, etc.</td>
</tr>
</tbody>
</table>
Transaction finality in blockchains

Recently, the problem of double spending accompanied by the defect of finality has occurred, such as Monacoin, Bitcoin Gold, Verge.

**PoW (Proof of Work)**

No limit on the number of participating servers, and each server competes to acquire the right to create blocks respectively.

It is **difficult to secure the finality** of transactions because blocks are generated stochastically and the ledger may temporarily branch.

**Byzantine Fault Tolerance**

When number of Byzantine Fault servers is $f$

According to the latest paper, it is mathematically proved that **Finality** will be secured if $2f + 1$ of them are agreed upon preparing $3f + 1$ servers.

3f+1 servers required

Guarantees **finality**, if $2f + 1$ units form consensus
Public vs. private blockchains for currencies

- Public blockchain does not fulfill the function of currency
- Consortium, Private block chain may have both advantage of decentralized ledger technology and functionality of currency

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium of exchange</td>
<td>Less acceptance, High exchange cost</td>
<td>Government can manage acceptance and exchange cost</td>
</tr>
<tr>
<td>Measure of value</td>
<td>High volatility</td>
<td>Government can control money supply to suppress volatility</td>
</tr>
<tr>
<td>Standard of deferred payment</td>
<td>Less acceptance, No guarantee</td>
<td>Government can manage acceptance and provide trust</td>
</tr>
<tr>
<td>Store of value</td>
<td>Less acceptance, No guarantee</td>
<td>Government can manage acceptance and provide trust</td>
</tr>
</tbody>
</table>
Advantages of consortium and private blockchains for currencies

- Management rules and an upgrade plan can be decided by a government
- Transactions can not be seen without a user’s consent or legal process
- In case of trouble, the government can support users

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System Management</td>
<td>Fork rules are decided by a few people like miners and large holders</td>
<td>Rules can be decided by government, but with separation of the powers to avoid concentration of authority</td>
</tr>
<tr>
<td>Monetary policy</td>
<td>No Monetary policy, No backed asset</td>
<td>Monetary policy is effective Asset baked by credit creation by government Control Money supply</td>
</tr>
<tr>
<td>Transaction privacy</td>
<td>No privacy, anyone can access all transaction data</td>
<td>Privacy Protection by access control accessible data range are different by Auditor, Bank, individual</td>
</tr>
<tr>
<td>User Protection</td>
<td>Money is lost if key is lost</td>
<td>In case of losing key, account can be recovered by Central Bank</td>
</tr>
<tr>
<td>Account Protection</td>
<td>Account can NOT be frozen, in an emergency, e.g., losing cell phone or suspicious behavior</td>
<td>Account can be frozen, in an emergency, e.g., losing cell phone or suspicious behavior</td>
</tr>
</tbody>
</table>
### CBDC globally

<table>
<thead>
<tr>
<th>Approach to Blockchain</th>
<th>Consideration of CBDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Japan</strong></td>
<td>Financial infrastructure, application process, e-government, data, ID by DLT</td>
</tr>
<tr>
<td><strong>China</strong></td>
<td>Published “Blockchain Registration Open Platform” for ID, healthcare, food monitoring, etc.</td>
</tr>
<tr>
<td><strong>Cambodia</strong></td>
<td>Joint development project for blockchain and new payment infrastructure</td>
</tr>
<tr>
<td><strong>USA</strong></td>
<td>PoC of voting system, real-estate registration, wealth transfer. Considering Energy, healthcare, logistics, etc.</td>
</tr>
<tr>
<td><strong>UK</strong></td>
<td>One of the most actively involved country in blockchain, e.g., intellectual asset, financial benefit, database</td>
</tr>
<tr>
<td><strong>Estonia</strong></td>
<td>Using Blockchain technologies to reference each other between each ministries, agencies and private sectors</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
<td>Officially started registration of properties including real-estate by blockchain</td>
</tr>
<tr>
<td><strong>Netherland</strong></td>
<td>Developing blockchain-based tax database, infrastructure of water and waste materials; researching legal services</td>
</tr>
<tr>
<td><strong>Russia</strong></td>
<td>Launched blockchain project of official documents control, voting control and others</td>
</tr>
<tr>
<td><strong>Dubai</strong></td>
<td>Launched blockchain project for all over Dubai, in health care, ID, increasing liquidity of property, tourism and others</td>
</tr>
<tr>
<td><strong>Uruguay</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Venezuela</strong></td>
<td></td>
</tr>
</tbody>
</table>
How about a common Asian cryptocurrency for foreign exchange settlement?

Advantages of common Asian cryptocurrency vs USD

<table>
<thead>
<tr>
<th>USD</th>
<th>Common Asian cryptocurrency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need to hold extra USD cash to settle in NY, due to time lag</td>
<td>No time lag and no need of extra USD reserves</td>
</tr>
<tr>
<td>Money supply control is difficult</td>
<td>Money supply become more easy</td>
</tr>
</tbody>
</table>
| Hedge cost of foreign exchange is expensive  
Countries with real demand principle can not over hedge | Hedge cost of foreign exchange becomes cheaper |

What is required from a technical point of view?
- Cryptocurrency based on a consortium blockchain
- A decentralized exchange platform
- Standardized protocol of interoperability which can connect to other blockchains (InterLedger), etc.
BUT,
a common currency zone has little empirical support for contributing to GDP growth *
(so it is best to be careful about the concept of unified currency zones and maybe rely on markets for providing liquid exchange between currencies)

Standardized QR code format

- Proposed standard QR code format to exchange assets among various platforms.

- Asset, sender, recipient, value and other information are embedded into QR code using variable-length JSON format.

<table>
<thead>
<tr>
<th>Key</th>
<th>Value (e.g.)</th>
<th>Detail</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>dit</td>
<td>{}</td>
<td>Identifier of &quot;standard QR code for DLT&quot;</td>
<td>No</td>
</tr>
<tr>
<td>protocol</td>
<td>&quot;iroha1.0&quot;</td>
<td>Protocol of DLT: ex. bitcoin, erc20, iroha1.0, etc.</td>
<td>No</td>
</tr>
<tr>
<td>asset</td>
<td>&quot;YEN#money1.alzu.jp&quot;</td>
<td>Asset location: &quot;asset#domain1.domain2.domain3...&quot;</td>
<td>No</td>
</tr>
<tr>
<td>recipient</td>
<td>&quot;<a href="mailto:account1@bank.alzu.jp">account1@bank.alzu.jp</a>&quot;</td>
<td>Address to recipient account (to whom)</td>
<td>Yes</td>
</tr>
<tr>
<td>sender</td>
<td>&quot;<a href="mailto:account2@bank.alzu.jp">account2@bank.alzu.jp</a>&quot;</td>
<td>Address to sender account (from whom)</td>
<td>Yes</td>
</tr>
<tr>
<td>command</td>
<td>&quot;transfer&quot;</td>
<td>Chain code or command of DLT (now)</td>
<td>Yes</td>
</tr>
<tr>
<td>value</td>
<td>&quot;1000&quot; or &quot;ticket1&quot;</td>
<td>Countable or uncountable value for chain code or command (what)</td>
<td>Yes</td>
</tr>
<tr>
<td>recipient_name</td>
<td>&quot;Aizu Tarō&quot;</td>
<td>Name of recipient</td>
<td>Yes</td>
</tr>
<tr>
<td>sender_name</td>
<td>&quot;Fukushima Jiro&quot;</td>
<td>Name of sender</td>
<td>Yes</td>
</tr>
<tr>
<td>description</td>
<td>&quot;Bill #00743&quot;</td>
<td>Description of funding or billing information</td>
<td>Yes</td>
</tr>
<tr>
<td>options</td>
<td>{}</td>
<td>For future use</td>
<td>Yes</td>
</tr>
</tbody>
</table>

"dit": {
  "protocol": "iroha1.0",
  "asset": "YEN#money1.alzu.jp",
  "recipient": "account1@bank.alzu.jp",
  "command": "transfer",
  "value": "1000",
  "description": "Bill #00743"
}
Vision of the future for blockchain: the “trusted Internet”

Internet:
- Can send “Information” all over the world
- but cannot send “value that cannot be tampered with”

Our vision:
- Interconnect various blockchains like the Internet (interledger)
- Aim to realize a blockchain network that covers the world
- The blockchain becomes a “Trusted Internet” that can send value that cannot be tampered with
What do we do?

Blockchain Platform

HYPERLEDGER
IROHA

Blockchain Platform
Hyperledger Project

With well over **230+** member organizations from around the world, including Soramitsu, the Hyperledger Project is working towards creating standards for distributed ledger technology.
# DLT Frameworks in Hyperledger

- The Hyperledger Frameworks currently has 5 projects, originally proposed by IBM, Intel, Soramitsu, Monax and Evernym/Sovrin Foundation.

<table>
<thead>
<tr>
<th>Framework name</th>
<th>Original developer</th>
<th>Programming language</th>
<th>Status</th>
<th>Target Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPERLEDGER FABRIC</td>
<td>IBM</td>
<td>Go</td>
<td>Active</td>
<td>B2B</td>
</tr>
<tr>
<td>HYPERLEDGER SAWTOOTH</td>
<td>Intel</td>
<td>Python</td>
<td>Active</td>
<td>IoT</td>
</tr>
<tr>
<td>HYPERLEDGER IROHA</td>
<td>Soramitsu</td>
<td>C++</td>
<td>Active</td>
<td>B2C</td>
</tr>
<tr>
<td>HYPERLEDGER BURROW</td>
<td>Monax</td>
<td>Go</td>
<td>Incubation</td>
<td>Eth users</td>
</tr>
<tr>
<td>HYPERLEDGER INDY</td>
<td>Evernym Sovrin Foundation</td>
<td>Python</td>
<td>Incubation</td>
<td>Retail</td>
</tr>
</tbody>
</table>
Hyperledger Iroha

Iroha was originally developed by Soramitsu and open sourced in September 2016. It was accepted into the Linux Foundation’s Hyperledger Project as the Hyperledger Iroha framework in October 2016.

Use case partners:

Simple & Fast
Transaction finality achieved within 3 seconds, with thousands of transactions processed per second.

Mobile SDKs
iOS, Android, and JavaScript SDKs are provided to ease development of end-user applications.

Asset Management
Assets such as currencies, points, tickets, securities can all be managed using core functionality in Iroha.

Development partners:
Advantages of Hyperledger Iroha

- **Open source**
  The internal logic is transparent, security evaluation is possible

- **High performance**
  Transaction finality within 3 seconds, Several thousand transactions per second

- **Privacy**
  Privacy protection by access control, accessible data range are different by role

- **Security**
  Multi signature, client wallet, no private key in server, permission model

- **Productivity**
  Command-driven architecture and robust SDKs, designed to increase developer productivity
Uses of Hyperledger Iroha

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. University of Tokyo, Aizu-Wakamatsu city: Regional currency, crypto-currency</td>
</tr>
<tr>
<td>Digital Identity</td>
<td>3. Rakuten Securities: PoC of KYC system</td>
</tr>
<tr>
<td></td>
<td>4. SORA app: Decentralized identity platform</td>
</tr>
<tr>
<td>Contracts</td>
<td>5. SOMPO: Contract handling automation using smart contract</td>
</tr>
<tr>
<td>SCM</td>
<td>6. PAL: Inventory management, Traceability system of foods</td>
</tr>
</tbody>
</table>
Other potential use cases

Digital asset
- Payments and settlement
- Contract management
- Securities transactions
- Financial securities management
- Supply chain management
- Smart grid

Digital identity
- Trade finance
- Know Your Customer (KYC)
- Notarization and time stamping
- Sharing economy services
- Medical
- IoT, etc.

Supply chain
- Trade finance
- Know Your Customer (KYC)
- Notarization and time stamping
- Sharing economy services
- Medical
- IoT, etc.
Appendix:

Technical advantage
&
Case study of Hyperledger Iroha
Command driven architecture

- Without writing code, asset, identity & supply chain management can be done using prepared commands in the data model

- This eases development and increases reliability

Prepared commands

<table>
<thead>
<tr>
<th>Peer</th>
<th>Domains</th>
<th>Assets</th>
<th>Account</th>
<th>Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AddPeer</td>
<td>CreateDomain</td>
<td>CreateAsset</td>
<td>CreateAccount</td>
<td>CreateRole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AddAssetQuantity</td>
<td>AddSignatory</td>
<td>AppendRole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TransferAsset</td>
<td>RemoveSignatory</td>
<td>GrantPermission</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SetQuorum</td>
<td>RevokePermission</td>
</tr>
</tbody>
</table>
Decentralized permission model

- Decentralized RBAC * permission model without single point failure
- Separation of three powers can be created to avoid concentration of authority
- Roles and permissions are set determined in the genesis block

* RBAC=Role Base Access Control

Example of Role Decentralization

[Diagram showing Legislative, Executive, and Judicial roles with arrows indicating Assign Role and Grant permission of account recovery]
What do we do?

Identity & Payments
SORA identity platform

Sora is a mobile application to manage self-sovereign identity. The Hyperledger Iroha blockchain is used to store hashes of a user’s information; a user’s information is encrypted on their device and no data are shared without a user specifically choosing to share it.
Case study: Moeka
Case study: event currency, Moeka

Working with the University of Tokyo, University of Aizu, and International University GLOCOM, we are doing basic economics research using Hyperledger Iroha. A field test of a prototype system for local currencies was field tested in November in Aizu-Wakamatsu City, in Fukushima Prefecture.

http://www3.nhk.or.jp/news/
Creating a currency through social interaction

① User shakes phone

② QR code is displayed

③ Other user scans QR code

④ New currency is distributed
Unified currency zones often favor the municipal areas at the expense of the countryside (Jacobs, 1984). Local currencies can help to motivate efficient utilization of resources in localities.

Moeka was designed around the idea that community interaction has economic value and can be quantified.

To avoid any possible legal complications, Moeka only existed for the short period of the one day event. However, Moeka was not convertible to JPY, so there is a low legal risk if we were to continue the experiment.

Case study: Byacco
Case study: regional currency, Byacco

Soramitsu is working with the University of Aizu to create a campus currency, Byacco, that will be used by students in the on-campus store and cafeteria. The currency is completely based on mobile apps. In March a test of the digital currency was conducted and in the Summer the live system will launch.

http://www.tv-tokyo.co.jp/mv/wbs/market/post_129389
Store and end-user apps

Cash register app for stores. Allows creation of new Byacco and receiving Byacco.

Mobile wallet for end-users.

http://www.tv-tokyo.co.jp/mv/wbs/market/post_129389
Creating Byacco

Byacco is usable as Japanese yen (slightly more buying power than JPY at the school cafeteria, due to a discount), so it is created by exchanging JPY for Byacco at 1:1 at the University of Aizu campus store.

http://www.tv-tokyo.co.jp/mv/wbs/market/post_129389
Spending Byacco

Spending Byacco is done via scanning QR codes.

1. Amount to pay is entered in the store’s cash register app. The user then scans the QR code.

2. The user’s phone reads the store’s address and amount to send and prepares the transaction to broadcast to the Hyperledger Iroha ledger. Digital signing of the transaction is done on the mobile device.

http://www.tv-tokyo.co.jp/mv/wbs/market/post_129389
Phone: 03-5843-8914
info@soramitsu.co.jp
Kazumasa Miyazawa | Makoto Takemiya

Soramitsu Co., Ltd.
Founder / SORA Director: Ikkei Matsuda
Founder / Co-CEOs: Makoto Takemiya, Ryu Okada
SORA Director: Kazumasa Miyazawa
〒102-0084 NihonTV Koujimachi Bld. Nishikan, 4F, 2-14 Chiyoda-ku, Tokyo, JAPAN
SESSION 4

Fintech

and

Trade & Supply Chain Finance
PANELISTS:

Thomas Olsen
Partner
Bain & Company

Boon-Hiong Chan
Director, Head of Business Control Unit & Market Advocacy, APAC
Deutsche Bank

MODERATOR:

Julius Caesar Parreñas
Coordinator
Asia-Pacific Financial Forum & Senior Advisor
Mizuho Bank
# New technologies have emerged to enable digitalization of Trade

<table>
<thead>
<tr>
<th>New technologies</th>
<th>Pre-transaction</th>
<th>Transaction processing</th>
<th>After transaction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Optical character recognition (OCR)</strong></td>
<td>Product selection</td>
<td>Data entry</td>
<td>Workflow management</td>
</tr>
<tr>
<td><strong>Artificial Intelligence (AI)</strong></td>
<td><a href="#">Intelligent &amp; personalized marketing</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Advanced analytics (AA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Robotic Process Automation (RPA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internet of Things (IoT)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distributed Ledger Technology (DLT)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Text Recognition</strong></td>
<td><strong>Populate fields</strong></td>
<td><strong>Efficient process &amp; productivity monitoring &amp; predictive analytics</strong></td>
</tr>
<tr>
<td></td>
<td>from trade docs to minimize data entry</td>
<td>with text extracted from documents (integrate OCR with txn process)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Enhanced KYC (e.g. web scrape)</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Real time verification & reconciliation**: workflow executed as per smart contract conditions; Replace payment & funds transfer with *cryptocurrency*
- **Bridge data flow and communication**: Integrate data from different systems into single interface
- **Ease of tracking**: goods and documents; **dynamic pricing & financing** triggered by shipment events; **automated payments release** based on “Smart Contracts”
- **Track document locations**: Track goods (location, volume, quality)
- **Intel’nt problem resolution**: Track indiv. error rates & flag users in need of remediation
- **Reports enable enhanced operations & strategic decisions**
- **Create smart LC as ‘Smart Contract’ on DL – auto notifications**

---

*This information is confidential and was prepared by Bain & Company solely for the use of our client; it is not to be relied on by any 3rd party without Bain’s prior written consent.*
DLT will shift trade volumes from Traditional Doc Trade, Open account and bring in new trade

Global merchandise volume

$24.8T

$16.0T

Payment Advances

Open Account

Traditional Doc Trade

1. ~40% of Traditional Doc Trade ($0.9T) will remain, after the rest moves to DLT solutions
2. ~40% of Traditional Doc Trade ($0.9T) move to DLT Doc Trade for better service levels & lower fees
3. Small portion of Open Account moving to DLT Doc Trade for enhanced risk mitigation & cheaper financing
4. New Trade volumes ($1.1T) due to DLT removing trade barriers; ~30% moves to DLT Doc Trade
5. Continued migration of Traditional Doc Trade to Open Account due to greater trust and visibility

Note: Chart not drawn to scale
Source: Bain DLT industry business case model

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Adoption of DLT in Doc Trade Finance will be gradual

**PHASES OF ADOPTION**

**Phase 0: Proofs of concept**
- Early adopters pilot key use cases in priority trade corridors with select anchor corporates

**Phase 1: Commercialization**
- Bilateral bank txns in specific trade corridors with large corporates and select corporate/industry/ Govt. led DLT platforms

**Phase 2: Rapid adoption**
- Rapid adoption by corporates, freight forwarders and customs agencies plus enhancements in value proposition & establishment of regulatory standards
- Add critical mass with more fast-follower banks, corporates, 3rd party service providers etc.

**Phase 3: Industry standard**
- Wide acceptance of regulations and full potential value proposition of DLT delivered to all ecosystem participants

**Adoption**

- Emergence of DLT technology providers, e.g., R3 and IBM
- Established proof of technology
- Reached broad consensus on full potential benefits
- Rapid adoption across multiple major trade corridors and industries
- Adoption across multiple Corporate/Gvmt./Industry led platforms
- Widespread adoption across all ecosystem participants
- Potential consolidation of DLT platforms
Doc Trade volumes are primarily from APAC

70% of LCs issued in Asia Pacific

Import: top 15 countries issuing import LCs

Export: top 15 countries advising export LCs

Source: ICC Global Trade & Finance survey 2017; SWIFT Trade Traffic in Figures MT Category 7 Enhancements Overview (Jul 2016), SWIFT Update IIBLP – 2014 Annual Forum/Survey
Driven by Asian demand, DLT in Doc Trade volumes expected to increase gradually over next 10 years

Doc Trade (Traditional & DLT) volume

<table>
<thead>
<tr>
<th>Phase</th>
<th>Traditional Doc Trade</th>
<th>New Trade vol</th>
<th>Open Acc to DLT Doc Trade</th>
<th>Total Doc Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 0 (2016)</td>
<td>1.9</td>
<td>2.1</td>
<td>1.9</td>
<td>16.0</td>
</tr>
<tr>
<td>Phase 1 (~3 years)</td>
<td>2.1</td>
<td>2.3</td>
<td>2.3</td>
<td>21.8</td>
</tr>
<tr>
<td>Phase 2 (~7 years)</td>
<td>2.3</td>
<td></td>
<td>2.3</td>
<td>24.8</td>
</tr>
</tbody>
</table>

- Total export value ($T)
  - Phase 0: 16.0
  - Phase 1: 19.1
  - Phase 2: 21.8
  - Phase 3: 24.8

- % of DLT-enabled Doc Trade
  - Phase 0: 0%
  - Phase 1: 17%
  - Phase 2: 45%
  - Phase 3: 65%

- % tradtl. Doc Trade converted to DLT
  - Phase 0: 0%
  - Phase 1: 10%
  - Phase 2: 30%
  - Phase 3: 40%

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Adoption of blockchain solutions can be accelerated by ecosystem drivers

Governments & regulators (of major trading hubs)
- Regulatory enforcement by major trading hubs to encourage DLT
  - E.g. regulations on digital signatures, digitization of ports, customs agencies etc.
- Favorable regulations on CAR, NSF etc. for DLT-enabled TF
- Commercialization of Govt.-led DLT initiatives
  - E.g. HK/SG introducing GTCP

Major trade banks
- Accelerate DLT investments to move from POCs to commercialization of major DLT consortia
- Quickly converge on set of standards
- Migrate volumes in major trading corridors to DLT, offering enhanced value proposition (forcing other banks to switch)

Trade finance vendors & ERP providers
- Invest in compatibility of current systems to DLT solutions, in their product roadmaps
  - E.g. BankTrade, Surecomp, Misys etc. upgrading TF solutions for banks
  - E.g. SAP, Oracle etc. upgrading ERP systems for corporates

Large corporates & shipping cos.
- Accelerate DLT investments to increase efficiency of supply chain, traceability etc.
  - Driven by large Commodity players in O&G, M&M, Agri; Shipping majors like Maersk etc.
  - Invest in own platforms or partner with banks in bank-led DLT initiatives
- Enforce adoption within supply chains & shipping channels

DLT infrastructure providers
- Actively invest in interoperability, openness of solutions
- Accelerate efforts to add critical mass to core nucleus (e.g. banks, corporates, shipping cos etc.)
- Partnerships with value added service providers, E.g. doc digitizers, logistic companies

Other new technologies
Emergence and adoption of other technologies that enhance benefits from DLT for all ecosystem participants, e.g., OCR, AI/ML, Advanced Analytics, RPA, IOT etc.
Governments: Few key Governments are potentially ready for early DLT adoption

Top 15 trading hubs make up ~64% of global trade

| Source: WTO; World Economic Forum; Government websites |

<table>
<thead>
<tr>
<th>Trading hub</th>
<th>Acceptance of eBL / e-certs</th>
<th>Extent of gvmt-led DLT trade initiatives</th>
<th>WEF index on quality of port infr.</th>
<th>Presence of single trade window</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>✔</td>
<td>1</td>
<td>4.6</td>
<td>✔</td>
</tr>
<tr>
<td>Japan</td>
<td>✔</td>
<td>2</td>
<td>5.3</td>
<td>✔</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>✔</td>
<td>3</td>
<td>6.5</td>
<td>✔</td>
</tr>
<tr>
<td>S. Korea</td>
<td>✔</td>
<td>4</td>
<td>5.2</td>
<td>✔</td>
</tr>
<tr>
<td>Singapore</td>
<td>✔</td>
<td>5</td>
<td>6.7</td>
<td>✔</td>
</tr>
<tr>
<td>India</td>
<td>✗</td>
<td>6</td>
<td>4.6</td>
<td>✔</td>
</tr>
<tr>
<td>USA</td>
<td>✔</td>
<td>7</td>
<td>5.8</td>
<td>✔</td>
</tr>
<tr>
<td>Germany</td>
<td>✔</td>
<td>8</td>
<td>5.5</td>
<td>✔</td>
</tr>
<tr>
<td>Netherlands</td>
<td>✔</td>
<td>9</td>
<td>6.8</td>
<td>✔</td>
</tr>
<tr>
<td>France</td>
<td>✔</td>
<td>10</td>
<td>5.1</td>
<td>✔</td>
</tr>
<tr>
<td>UK</td>
<td>✔</td>
<td>11</td>
<td>5.5</td>
<td>✔</td>
</tr>
<tr>
<td>UAE</td>
<td>✔</td>
<td>12</td>
<td>6.2</td>
<td>✔</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>✗</td>
<td>13</td>
<td>4.7</td>
<td>✔</td>
</tr>
<tr>
<td>South Africa</td>
<td>✗</td>
<td>14</td>
<td>4.8</td>
<td>✔</td>
</tr>
</tbody>
</table>

Legend:

- Countries with high ease of DLT adoption
- Trade-related DLT commercialization
- Trade-related POCs
- Non-trade initiatives
- Few or no initiatives
- Well-developed, digitized & efficient
- Extremely underdeveloped & mostly manual
- Single window present
- In pilot phase/ not available at all ports/regions

SG, HK, S. Korea, Netherlands and Dubai among hubs with favorable regulations for early DLT adoption
Ecosystem participants are actively experimenting and investing in DLT solutions to facilitate cross-border trade

**Banks**
- Banks lead DLT Trade Finance initiatives
  - **Multi-bank JVs** develop and test private DLT networks
  - Large global/ regional trade banks conduct bilateral POCs
  - Bank consortiums mobilized by DLT infrastructure providers (e.g. R3, IBM)

**Corporates**
- **Trade platforms**
  - Provide efficient post-transaction mgmt. solution for physical energy commodities trading
- **Supply chain tracking solution**
  - Provide ability to track movement of goods

**Government**
- **Trade finance platforms**
  - Major trading hubs develop DLT-based trade finance platforms to facilitate domestic and cross-border trade in specific corridors

**3rd Parties**
- **Supply Chain Financing**
  - Provide one-stop credit facilities with shipment booking
- **Trade platforms**
  - Launch end-to-end digital shipping information on platform

---

**R3 Doc Trade**
- Formed a consortium with other trading houses and banks to manage physical energy transactions

**bp, Shell, Statoil**
- Leverage DLT to record movements of wellbore rock and fluid sample
- Ensure timely delivery

**HK Monetary Authority**
- Partnered 5 banks and Deloitte for PoC using DL platform for trade finance

**bhp billiton**
- Developed a DLT based LC application to test with select corporates / shippers

**MAERSK**
- Provide end-to-end shipping information and automated trade paperwork services

**Trade platforms**
- Major trading hubs develop DLT-based trade finance platforms to facilitate domestic and cross-border trade in specific corridors

**Supply Chain Financing**
- Provide one-stop credit facilities with shipment booking

**Trade platforms**
- Launch end-to-end digital shipping information on platform

---

Source: Company websites
### 3rd Parties: Potential partnerships with 3rd party service providers and technology vendors

<table>
<thead>
<tr>
<th>Bank TF tech providers</th>
<th>Corporate tech providers</th>
<th>Other service providers</th>
<th>Logistics and shipping cos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core TF vendors</td>
<td>ERP providers</td>
<td>Document digitizers</td>
<td>Logistics</td>
</tr>
<tr>
<td>BT Systems</td>
<td>SAP S/4 HANA</td>
<td>Bolero</td>
<td>DHL</td>
</tr>
<tr>
<td>Surecomp</td>
<td>ORACLE ERP</td>
<td>eTitle</td>
<td>CEVA</td>
</tr>
<tr>
<td>China Systems</td>
<td>Microsoft Dynamics 365</td>
<td></td>
<td>KUEHNE+NAGEL</td>
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<tr>
<td>MISYS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FINASTRA</td>
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<tr>
<td>CGI</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>iGTB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core banking providers</td>
<td>Accounting software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infosys</td>
<td>Xero</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finacle</td>
<td>MYOB</td>
<td></td>
<td></td>
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<tr>
<td>TCS</td>
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<td></td>
<td></td>
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<tr>
<td>BANKS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SILVERLAKE</td>
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<td></td>
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<tr>
<td>TEMENOS</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Core tech providers</td>
<td>Invoice mgmt solutions</td>
<td>DL-based contracting &amp; doc handling solutions</td>
<td>Shipping companies</td>
</tr>
<tr>
<td>ERP providers</td>
<td>Taulia</td>
<td></td>
<td>MAERSK</td>
</tr>
<tr>
<td>ERP</td>
<td>ebpSource</td>
<td></td>
<td>CMA CGM</td>
</tr>
<tr>
<td>Accounting software</td>
<td>Esker</td>
<td></td>
<td>MSC</td>
</tr>
<tr>
<td>DL-based contracting &amp; doc handling solutions</td>
<td>Skuchain</td>
<td></td>
<td>Hapag-Lloyd</td>
</tr>
</tbody>
</table>
DLT platforms likely to consolidate over time

**Main players**

Phase 1: Commercialization (next 2-3 years)
- VoltronX
- Marco Polo
- Batavia
- Trade360/SkuChain
- Global trade connectivity platform by HKMA and MAS
- LC application by IDA, BAML, HSBC

Phase 2: Rapid adoption (in 5-7 years)
- R3 Doc Trade

Phase 3: Industry standard (in 10+ years)
- R3 Doc Trade

**Key drivers**

- **First mover advantage** and economic upside motivates several interest groups to lead different initiatives
- **No standard** established
- Different business / commercial models yet to be tried out

- **Key players aggressively** defend their first-mover advantage by building scale and creating a global footprint
- Major players begin to emerge, buying up competitors

- Main players expanding core business and continuing to outgrow the competition
- Establishment of industry standards and formation of alliances across top players

Source: Company websites
Revenue impact: Four key drivers

1. **Trade volumes**
   - Traditional Doc Trade moving to DLT Trade

2. **Fee income**
   - Net lower fee income - assumes lower fees for DLT driven by bank passing on lower costs

3. **Financing income**
   - Gain in financing income from higher % of financed Doc Trade txns with DLT

2. **Trade volumes**
   - Traditional Doc Trade moving to Open Account with DLT

2. **Fee income**
   - Loss of Doc Trade fee income (net lower bank fees driven by lower fees of Open Account)

3. **Financing income**
   - Loss of Doc Trade financing income, (net impact potentially offset by higher cost Open Acc financing in some cases)

3. **Open Account moving to DLT DOC Trade**

4. **New fee income for DLT Doc Trade**

3. **Open Account moving to DLT DOC Trade**

4. **New fee income for DLT Doc Trade**

4. **New Trade volume adoption of DLT Doc Trade**

4. **New fee income driven by new volumes entering global Trade**

4. **New financing income driven by new volumes entering global Trade**
Cost savings: Automation through DLT estimated to generate ~80% cost savings

~80% Reduction In processing time with DLT automation

<table>
<thead>
<tr>
<th>Processing time step*</th>
<th>Time reduction</th>
<th>Reasons for improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive &amp; Validate Application</td>
<td>70-90%</td>
<td>Electronic submission and validation of document through DLT</td>
</tr>
<tr>
<td>Create Transaction</td>
<td>50-60%</td>
<td>Auto creation of txn from data pulled from DLT (saving manual data entry)</td>
</tr>
<tr>
<td>AML checks</td>
<td>80-100%</td>
<td>Automate sanction checks, transaction monitoring &amp; filtering</td>
</tr>
<tr>
<td>UCP checks</td>
<td>60-80%</td>
<td>Potential to automate with predefined data matching conditions</td>
</tr>
<tr>
<td>Report Generation</td>
<td>80-100%</td>
<td>Real-time and automated reporting</td>
</tr>
<tr>
<td>Inform Customer</td>
<td>80-100%</td>
<td>Instant notification to the customer</td>
</tr>
</tbody>
</table>

Will be driven by DLT and other technologies (OCR, AI/ML, IOT etc.); ~50-70% savings assumed for business case calculations
Mobility Service:
Create economical and environmental empowerment in the AESEAN countries

Global Mobility Service, Inc.
Company Profile

Overview

Name: Global Mobility Service, Inc.
H.O.: 4F Shiba Daimon Building II, 1-12-16, Shiba Daimon Minato-ku, Tokyo
Established: 2013/11/25
Capital: 1,739 Million yen (Capital Surplus Included)
Branch: Global Mobility Service Philippines, Inc.
Business: IoT Platform Service for Mobility
Second Inflection Service of Big Data

Organizational Shareholders

Hiroshi Komiyama: Former Tokyo University President
Director of Mitsubishi Research Institute
Katsumori Matsushima: Former PWC Managing Director
Previous Business Model Society’s Chairperson
Shozo Kurihara: Former Nissan Motor VP & Global CIO
Soichiro Fukutake: Benesse HD Supreme Advisor
Tokushi Nakashima: Representative Director

Our Engineer previous career (Picked)
GMS Mobility × IoT × Fintech Technique

Investment Support from Top Cooperatives of Every Business Domain

Global Mobility Service

- Mobility Service Platform 「MSPF」
  - Vehicle Management / Information Analysis (AI)

- IoT Device 「MCCS」
  - Remote engine control / Sensing

- Open API
  - AI, DB, App

Connected
- Various types of mobility
## Average Age and Economic Growth

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Age</th>
<th>Annual GDP Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>46</td>
<td>1.2%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>29</td>
<td>5.0%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>24</td>
<td>6.8%</td>
</tr>
<tr>
<td>Philippines</td>
<td>23</td>
<td>6.9%</td>
</tr>
</tbody>
</table>
Rejection Rate of Auto-Finance (including Potential)

- Japan: 30%
- Indonesia: 70%
- Philippines: 80%
- Cambodia: 90%
However, Population without Chance of Auto-Finance is 2 billion

Undeveloped Environment to Maximize the Potential

Registered: 1.1 billion
Sales: 0.1 billion
Innovation to Auto-Finance Service

Provision of Auto-Finance to those who was REJECTED

Those Pass the Credit Investigation

Conventional Finance Target was only this layer

Those Rejected by Credit Investigation
But Have an ability to pay

Huge Market Size of Unapproached Target

GMS Provides Solution

Don’t have ability to pay
Solution by GMS IoT Device

MCCS
Mobility-Cloud Connecting System
Patent: PCT submitted

Mobility with MCCS Device

MCCS Device can Deactivate the Car
Increase the Incentive of Payment

Conventionally, vehicle can be used even after delay of payment

No Internet Connection After Delay Payment

Incentive toward Payment is HIGH

Can Utilize the Vehicle After Delay Payment

Incentive toward Payment is LOW
VALUE GMS Provide

Before

Big gap among Finance Company & Distributer & USER

Finance Company

OEM • Vehicle Distributor

Cannot sell the car

Finance to limited user

Cannot buy the car

Connection of Finance Company & Distributer & USER

After

Finance Company

Increase Balance

Vehicle Distributor

Increase Sales

Vehicle USER

Wealthier Life
GMS Service model

Philippines

FinTech Service

Finance company

Revenue share

Loan Lease

Payment

Contractor

Philippines Vehicle market

- Tricycle: 51%
- Jeepney: 26%
- 4 wheel: 12%
- Others: 11%
Default rate which changes the financial industry

Current

Default Rate

20%

GMS Service

Default rate

0.9%
Business Development in the Philippines

Signing ceremony with the Mayor of Philippines Greatest City Kaesong City (February 2, 2015)

Signing ceremony with the Mayor of Wall Street Makati city of Philippines (October 6, 2015)

Signing ceremony with the Mayor of Philippine metropolitan area Pasay city (March 16, 2016)

Signing ceremony with the Mayor of Paranaque city of Philippines (June 22, 2017)

Signing ceremony with the Mayor of Navotas city of Philippines (August 3, 2017)

Three Philippine infrastructure majors (communication, rate recovery, electricity) tie up with GMS toward IoT platform realization (April 9, 2015)

Three Philippine infrastructure majors (communication, rate recovery, electricity) be suitable for PLDT of the Philippines's biggest carrier, a service offer to the whole land of Philippines and tie up with GMS (August 22, 2016)
Visualization of Various Mobility Record
Creation of Value for USERS

The Utilization of Transaction Data for User Credit Information

VALUE that USER Receives

Receiving Auto-Finance (Rejected Before)

Work Hard Everyday Using Mobility

Creation of New Credit

GMS Add Value to Information

Personal Information

Mobility Utilization Record

Provision to Financial Institutions

AI connected GMS Platform achieves Value Addition to Information
Wealthier life by providing new credit

Student loan for parents who want their children to go to study

Those who cannot Attend at school

Philippines: 4 million

World: 67 million

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Lending the happiness

GMS service by IoT and FinTech

Increase Income

Creation of sustainable society
Through the provision of Mobility Service
We Make People Happy
Fintech and Financial API

Junichi KANDA
Executive Officer, Money Forward, Inc.
CEO, Money Forward Financial, Inc.
June 18, 2018
Junichi Kanda Profile

- Executive Officer, Money Forward, Inc.
- Representative Director, President and CEO, Money Forward Financial, Inc.
- Director, FINTECH ASSOCIATION OF JAPAN

■ 1994-2017 Bank of Japan
Mainly conducted monitoring, examination, credit and market risk management of banking

■ 2015-2017 Financial Services Agency
Conducted the research and planning of payment reform and Fintech as a Director at Planning and Coordination Bureau

■ 2017-Present Money Forward
Served as CEO at Money Forward Financial and in charge of government relations at Money Forward

■ Education
Tokyo University (BA of Faculty of Economics) in 1994
Yale University (MA of International and Development Economics) in 2000
1. About us
Money Forward. Move your life Forward.

We aim to solve money-related issues of all individuals and businesses through building an open and fair financial platform and providing essential services.
Business Overview

We provide BtoC and BtoB services to solve problems related to “Money”.

Personal Financial Management

We eliminate all money-related concerns of individuals to move their lives forward.

6.5 million+ users

SaaS Accounting/ERP

We resolve businesses’ managerial issues to move the Japanese economy forward.

3,000+ accounting offices
Listed on Tokyo Stock Exchange Mothers on Sep 29, 2017.
Members

Just turned 6 years old.
Now work with more than 300 members.
New Initiatives with Cryptocurrency and Blockchain

New Entity
“Money Forward Financial, Inc.”
New Entity’s Business

1. Media
2. Cryptocurrency Exchange
3. Payment Platform

*Image taken from “Money Plus”*
Other Solutions

Risk Control and Tax Return

- bitFlyer
- Zaif
- BTCBOX
- bitbank
- QUINEX
- FISCO
- Money Forward
- MFクラウド確定申告
2. Enhancement of Fintech
2-1. Building Ecosystem
Launch of Fintech Association of Japan (Oct. 2015)

- Starting from a meetup, the community grew to an association
- Supported development as representative from JFSA
Institutional Support

FinTech Summit (Fin/Sum)

Themes
- Fintech in Asia
- Future of Blockchain
- Strategy for traditional financial institutions
- Role and potential challenges of public sector

Speakers
- Authorities (UK, Singapore, Luxembourg, Indonesia, etc.)
- Taro Aso, Minister of Finance
- Nobuchika Mori, Commissioner of the JFSA
- Founders from various global startups
- MIT media lab
- CEO and executives from Japanese representative banks

*Excerpt from the 1st Fin/Sum.
2-2. Collaboration with Foreign Authorities
International MOU

United Kingdom, FCA (March 9, 2017)

Swiss, FINMA (April 4, 2018)

Singapore, MAS (March 13, 2017)

Abu Dhabi, FSRA (Sept. 21, 2017)

Australia, ASIC (June 23, 2017)
2-3. New Regulations
1. Registration to JFSA
   All the exchanges required JFSA registration

2. Operational Standards
   (Ex.) KYC upon account opening,
   Segregation of client assets

3. Exemption from consumption tax (July 2017)

   Amid largest transaction volume globally,
   Coincheck hack changed regulatory climate
Open API （enforcement in June 2018）

1. Europe
   - Open Banking Standard - UK
   - PSD2 - European Banking Association

2. Model Banks
   - Credit Agricore Store - Credit Agricore
   - API Market - BBVA
   - API Platform for developers - Fidor Bank
3. Open API in Japan
Before API-based Infrastructure

Asking customer credentials were obstacles towards Fintech services in utilizing data.
After API-based Infrastructure

User can securely use Fintech service.

- Token Issuance Request
  - ID/pass not required
  - Contract based API Connection
  - Able to provide service
  - Provide transaction data

JFSA Registered Fintech Startup
Criteria for Selecting Banks

- Distance to ATM and branches were long time priority
- Quality of online services not necessarily prioritized

Source: Created based on the survey conducted by Central council for financial services information *Includes uncontinuous data
Future Scope of Customer Choice

Current

Future

Banks

Others

ATM

Depositors

API

Outside services

Tie-up services

Apps

ATM

Banks

Depositors
JFSA’s viewpoint

1. Mass product (BtoC) to tailor made product (CtoB)
   • IT, accumulation of lifelogs and big data processing, AI and deep learning will transform traditional BtoC into tailor made servicing (CtoB)

2. Customer-focused business model
   • Accumulation and utilization of customer data, customer centric business model, and trusted relationship will be key for the future

3. New Image of Network

Source: JFSA document
Where Financial Regulation is Heading

To facilitate unbundling and rebundling of functions
-> From entity-based to function-based regulations?
   - What to protect? Deposits, payment and settlement, or credit creation?
   - Level playing field among different entities with similar functions?
   - Managing conflicts of interest within a group with diverse functions?
   - Shielding protected functions from unregulated functions?
   - How best to protect customer information?

To respond to changes in the shape of the financial network
-> From banking style regulations to capital market style regulations?

To achieve both innovation and customer protection
-> Regulatory sandbox and informed consent?

Source: JFSA conference document
4. International Collaboration
International Cooperation on Policy

1. Introduction of Innovative Products and Services
   • License Standardization
   • Regulatory Sandbox

2. Client Protection beyond borders
   • Necessity of cryptocurrency and ICO regulation
   • Data ownership and portability
   • Market monitoring and cooperative RegTech advancements

3. Talent exchange
   • Deregulation of working visa and residence permit

Constructing multi-country cooperation to develop the industry
Standardization Initiatives

1. Open API
   - Data connection, authentication, data format, etc.
   - Cooperation of banks and startups beyond borders

2. Payment infrastructure
   - Common network
   - Payment information, settlement method

3. Guideline formulated by private parties
   - Cryptocurrency, crowdfunding, etc.

Aim to create standards from Asia
International collaboration Public/Private

1. **Informational Exchange**
   - Future forecasts
   - Cutting edge models
   - Problems and solutions

2. **Enhancement through Networking**
   - Sharing and brushing up ideas
   - Talent interaction

3. **English Information**
   - Sharing each country’s information in English to increase cross-border entry

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Formulate Asian Fintech ecosystem
Thank you!

Disclaimer

The forward-looking statements and other contents included in this material are determined based on information currently available, and may be subject to change due to macro economic trends, changes in the market environment or industry in which the Group operates, or for other internal/external factors. Money Forward, Inc. shall not represent or warrant the accuracy or completeness of the information contained in this material.

This material is an excerpt translation of the original Japanese material and is only for reference purposes. In the event of any discrepancy between this translated material and the original Japanese material, the latter shall prevail.
Technology beyond Borders
How we can harness new technologies to integrate Asia?
RegTech and SupTech Panel
June 18th, 2018
Challenges Impacting Regulators and Thomson Reuters Solutions

Responsibility

1. Implementation of Monetary Policy
   - A: Maintaining Market Stability
   - B: Understanding Policy Impact
   - C: Reducing Internal Costs

2. Regulation & Supervision of Markets and Institutions
   - A: Enforcing Compliance
   - B: Understanding Systemic Risk
   - C: Evolving Regulation

   - A: Deploying Efficient Processes
   - B: Improving Infrastructure
   - C: Addressing Financial Crime

4. Modernization & Development of Financial Sectors
   - A: Improving Transparency
   - B: Encouraging Investment
   - C: Innovation: FinTech / RegTech

Where Thomson Reuters Capabilities Align

- Global, evolving trading platform
- Real-time trade reporting
- Partnering on data & analytics needs
- Data delivery for in-house platforms

- Accurate market activity assessment
- Peer collaboration & benchmarking
- Tracking regulatory compliance
- Risk & compliance best practice

- Automating debt issuance process
- Deal tracking enabling OTC visibility
- Partnering on STP standardization
- Connecting market counterparties

- Aggregating domestic market activity
- Clarified market rules/requirements
- Connecting global peer groups
- Training partners

Trading Capabilities
- Market Transparency
- Content & Analytics
- Global News Coverage
- Data Management

KYC / Screening Tools
- Workflow Tools
- Regulatory Intelligence
- Learning Capabilities

Auction Management
- Market Transparency
- OTC Content Expertise
- AML Tools
- Legal, Tax, IP Capabilities

Interbank & B2C Trading
- Market Transparency
- Bespoke Initiatives
- Financial Education
- Consumer Protection
Thomson Reuters PermlD
A Barcode for Information

PermlDs are:
- Complementary — to the Reuters Instrument Code (RIC), International Security Identification Numbers (ISINs), Legal Entity Identifiers (LEIs), and other identifiers
- Comprehensive — provides identification across a wide variety of organizations, instruments, funds, issuers and people
- Connected — PermlDs connect all data sets in the Thomson Reuters information model, helping gain valuable insights
- Machine-readable — a 64-bit number that operates beneath the surface to connect related information instantly and seamlessly
- Open — Thomson Reuters open strategy is driving new opportunities, collaboration and innovation; we are Open Data Institute (ODI)-certified
- Permanent — a never reused identifier is assigned to each information object; they don’t change and allow you to trace object changes over time
- Precise — points to each specific information object
- Scalable — a vast number of PermlDs are available
- Unique — each instance has its own PermlD

PermlDs: Creating powerful connections at the center of the Thomson Reuters Information Model

CURRENCY
Canadian dollar
PermlD: 500140

INSTRUMENT
Ordinary Shares
PermlD: 300281

ASSET CLASS
PermlD: 100052

GEOGRAPHY
Canada
PermlD: 100053

ORGANIZATION
Thomson Reuters Corp
PermlD: 429586160

QUOTE
Primary Ticker — TRI
Primary Exchange — TSX
Primary IRC — TRLO
PermlD: 558388603327

TR INDUSTRY CLASSIFICATION
Professional Information Services (NEC)
PermlD: 4294951759

Power your systems:
- Develop platforms with PermlD.org for easily searchable and better-connected data that returns the right connections to you
- Generate Alpha by tagging all your data and exposing powerful linkages for unique insights
- Link your cross-asset information to connect all of your non-streaming information for pricing and reference data needs
- Manage data with Intelligent Tagging to explore, clean, tag & catalog your assets for better structure
- Manage risk with Org ID by gaining insight into business events and securely mapping the information to your own data

For more information visit permld.org
Find More Relevant Search Results Faster

Thomson Reuters Intelligent Tagging™: Making Data Intelligent

Structured Metadata
Our unique identifiers leverage the deep knowledge in Thomson Reuters’ professional data, creating semantic metadata to enrich your own content – and also mapping it to Thomson Reuters’ content to give the best of both worlds.

Permanent Identifiers
Thomson Reuters’ key advantage is assigning unique identifiers, or PermIDs, which go beyond keywords, returning the right connections you’d otherwise miss.

Proprietary Data & Client Data

Proprietary Identifiers / Identifier Database Management

Intelligent & Actionable Insight and Output:
To Staff and Clients

https://www.youtube.com/watch?v=N2VzH4MX21E&feature=youtu.be

Turning qualitative, unstructured text into quantitative and actionable insight.…
BOLD Solutions

**Objective** - Provide a big data environment for clients to experience Thomson Reuters content. **TR Data Fusion** is a big data integration environment. It’s leading-edge graph technology and data integration platform connects the dots of big data.

**Objective** - **Open PermID** website (permid.org) enables anyone to start integrating PermIDs which are TR’s permanent and unique identifiers to their solutions.

**Objective** - Help clients link unstructured & structured data to quickly deliver valuable insight. **Thomson Reuters Intelligent Tagging (TRIT)**: Gives customers a fast, easy way to tag and connect to TR by tagging their textual content with organizations, people, topics and events.

**TR Knowledge Graph Feed**: Helps customers understand the nature of existing relationships around the key identities that they are invested in including organizations, instruments, supply chains, people, sanctions, and more.

**Objective** – Derive insights from unstructured data available through TR.

**USE CASES**

- Advanced Search & Navigation
- Alpha Risk
- Research
- Sales & Trading
More than 3,000

data experts globally managing Thomson Reuters’ data

Over 30 years of expertise managing People data which now includes heightened risk individuals from the Worldcheck database

It takes one week to deliver insights and analytics with Data Fusion – vs. 18 months which is typical time for self build solutions

5 Billion Triples

are captured in our Knowledge Graph feed – and this number is constantly growing

Over 8 years of expertise building an information model and mastering our data around PermID

20 minutes to get up and running with Data Fusion software

We have been training Intelligent Tagging engine since 2007

100 data scientists and developers working on TR’s BOLD Solutions
Reuters News:
How does one quickly and consistently tag massive amounts of unstructured text?

We can now link unstructured and structured data

Doesn’t it just make sense to connect it all?

TR Intelligent Tagging:
Natural Language / Unstructured Text Processing

PermID:
Unique and permanent identifier for every entity, all open source. Matching capabilities

Knowledge Graph:
Billions of relationships mapped precisely across millions of data points

One out of Hundreds of Sources...
How can we scale the solution? How do we disambiguate terms? How do we combine this with our curated and structured data?
TR Knowledge Graph – A Wealth of Knowledge

- **Currency**: Canadian Dollar
  - PermiID: 500140

- **Asset Class**: Ordinary shares
  - PermiID: 300281

- **Instrument**: TR Ord Shares
  - PermiID: 85909928696

- **Geography**: Canada
  - PermiID: 100052

- **Organization**: Thomson Reuters Corp
  - PermiID: 4295861160

- **TR Industry Classification**: Professional Information Services (NEC)
  - PermiID: 4294951759

- **Quote**: Primary Ticker – TRI
  - Primary Exchange – TSX
  - Primary RIC – TRLTO
  - PermiID: 55838860337
Advanced Analytics and Data Visualization
ANY QUESTIONS?
Digital Identity is Fundamental to the Digital World We Live In

Identity is a central tenant to the digital economy, the essence of how individuals, organizations and assets operate on a daily basis.

We leave digital attributes scattered everywhere, as they are needed to interact across every vertical of society.

When combined with emerging technologies, digital identity will drive societal transformation:

- Consumer-driven economy
- Technology-driven economy
- Data-driven economy
- Integrated economy
- Innovation leads regulation
- Security
- Ethics & Privacy
- Interoperability

A necessity for everyday transactions:

- Banking transactions
- Online purchases
- Access to services
- Government security
- KYC / Supplier Risk Assessment
- Access to email, social media
- Employee onboarding
- Access to utilities / transportation

But there are systemic challenges:

Increase in US Credit Card Fraud
Percent of total Identity Theft complaints

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>17.4</td>
</tr>
<tr>
<td>2016</td>
<td>32.7</td>
</tr>
</tbody>
</table>
BlockOne IQ provides developers with access to Thomson Reuters market data for inclusion in blockchain / distributed ledger applications.

At the time of the Beta launch (June 2017), a limited subset of the wide market data universe is available via the Oracle which includes:
- Corporate Actions
- Historical Pricing (Equities and Foreign Exchange only)
- Benchmark Data e.g. LIBOR
- Other content sets will be considered based on market demand

BlockOne IQ is currently compatible with:
- Ethereum
- Corda
- Others considered based on demand

BlockOne IQ
- May only be used for Proof of Concepts
- May not be used in production systems
- May not be used on public chains
Unstructured Content
Content uploaded from news articles, blog postings, proprietary data, catalogs, social media, and more

Extract, classify and tag metadata

Structured Metadata
Our unique identifiers leverage the deep knowledge in Thomson Reuters’ professional data, creating semantic metadata to enrich your own content – and also mapping it to Thomson Reuters’ content to give the best of both worlds.

Permanent Identifiers
Thomson Reuters' key advantage is assigning unique identifiers, or PermIDs, which go beyond keywords, returning the right connections you’d otherwise miss.