
Business Innovation driven by Blockchain

11/13/2017

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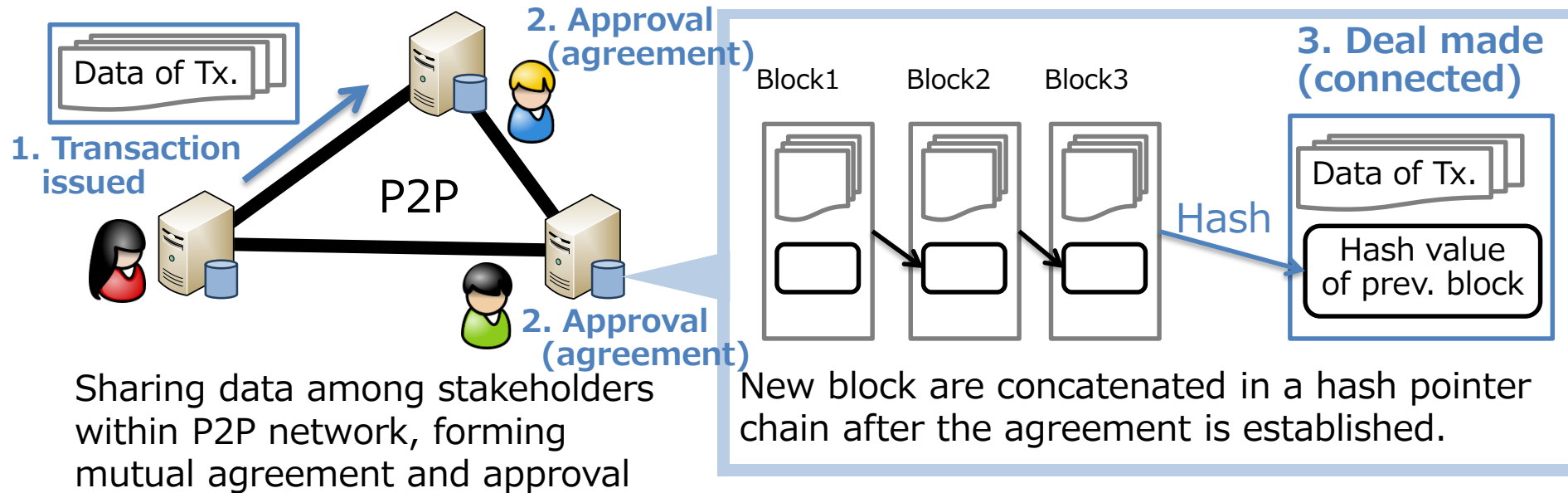
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1 . Blockchain technology overview

Distributed processing technologies based on many tech., P2P comm., digital signature, consensus building, etc.

- Each node has signed a transactional record and issue it.
- All nodes are connected to each other by P2P way, and process it by getting agreements.
- The blockchain system has kept a chain of all the data by "Block" structure, which contains several transaction records.



Benefit: Sharing reliable data among multiple entities

Many people expect for applications in various fields such as asset mgmt., general transactions, etc.

Two types are known: Public and Consortium ones

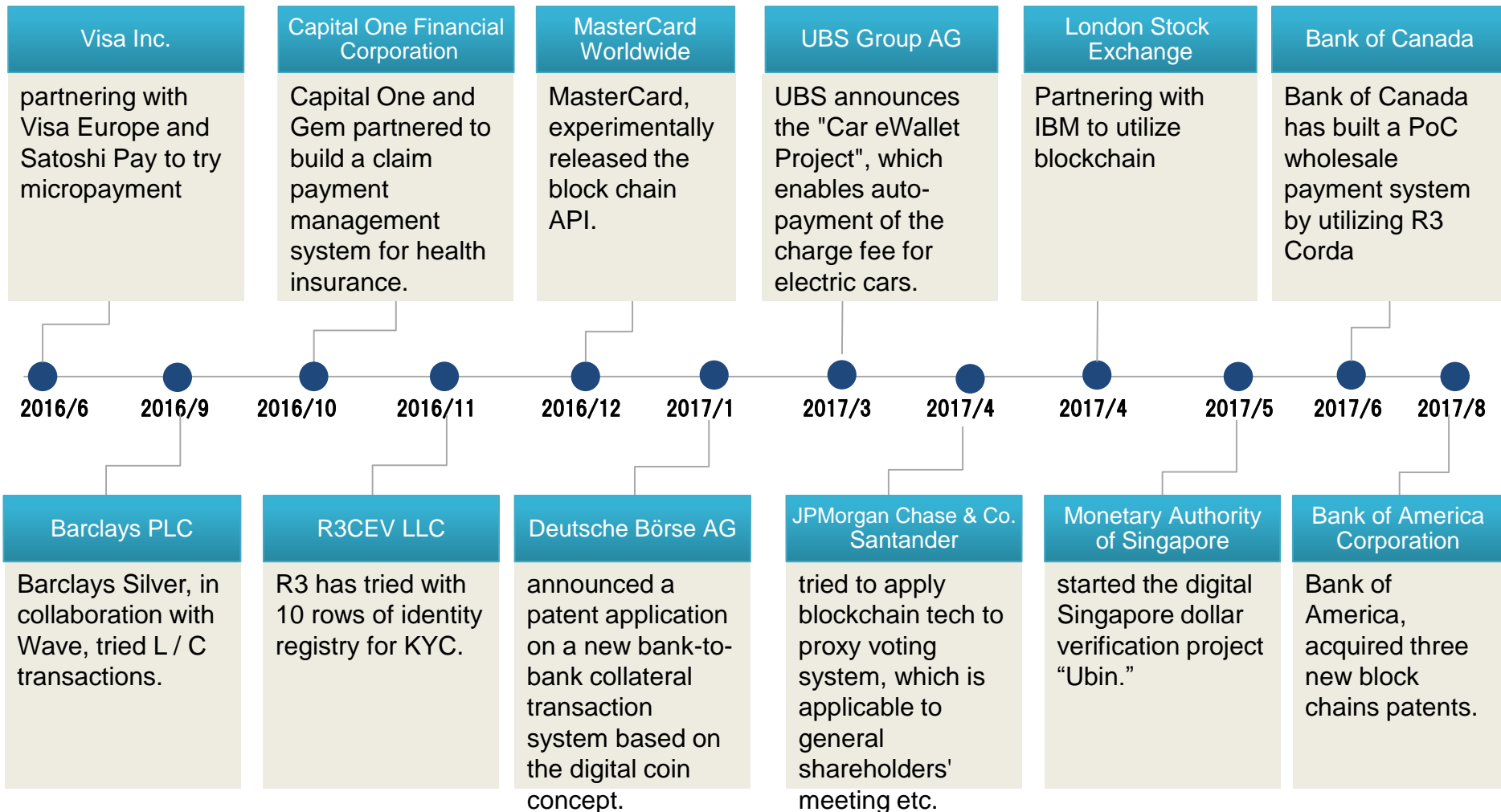
- In the financial industry, Consortium/Private type of blockchain would be adopted quickly in order to meet the requirements of performance and compliance.
- We are considering the balance of each requirement related to use case for financial application.

Type	Public	Private/Consortium
Requirements	Trading reliably b/w many of unknown nodes	Trading frequently b/w known nodes
Technical Origin	derived from Bitcoin	derived from distributed system software
Examples	Bitcoin, Ethereum	Hyperledger Fabric
Nodes authorization	Many and anonymous nodes join the network	Reliable and autholized nodes join the network.
Strictness of consensus building	Mandatory (ex. Proof of Work: tamper prevention by imposing a large amount of calculation process)	Optional (only authorized nodes can approve each transaction)

Enterprise users can use this easier.

Many efforts and PoCs are undergoing

Many of oversea financial institutes and central banks are accelerating the studies and increasing the investments into blockchain world.



2 . Hitachi's activities related to Blockchain

Hyperledger is an open source project hosted by The Linux Foundation to develop de-facto standard blockchain platform.

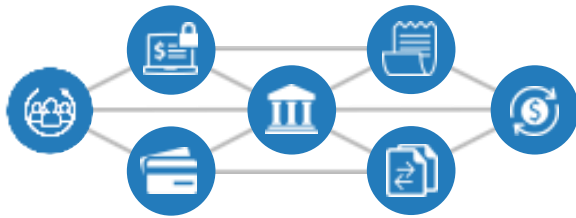
Hitachi began researching blockchain technologies in the early 2000's with its first patent issued in 2003, and now is a board member of this project.

Hyperledger is a global collaboration including leaders in finance, banking, Internet of Things, supply chains, manufacturing and Technology.

[PREMIER MEMBERS]

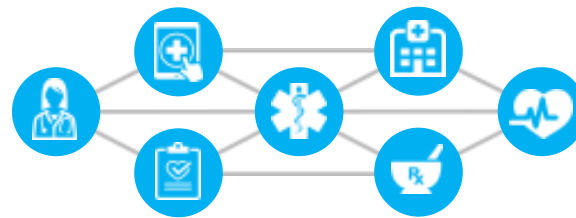
- Accenture
- Airbus
- American Express
- Baidu
- CHANGE Healthcare
- Cisco
- CME Group
- Deutsche Börse Group
- Daimler
- Digital Asset Holdings
- DTCC
- Fujitsu
- **Hitachi**
- IBM
- Intel
- J.P.Morgan
- NEC
- R3CEV
- SAP
- TRADESHIFT
- FFan Technology
under Wanda Group

Blockchain enable multiple participants to cooperate securely, using the common, synchronized, authentic data source, and are expected to be applied to various fields. In the Hyperledger Project, we have already begun activities aiming at application in the following business areas.



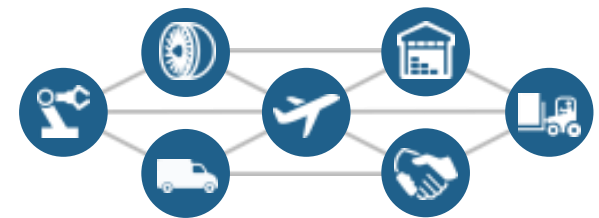
Finance

- Streamlined settlement
- improved liquidity
- increased transparency
- new products/markets



Healthcare

- Unite disparate processes
- increase data flow and liquidity
- reduce costs
- improve patient experience and outcomes



Supply chain

- Track parts and service provenance
- ensure authenticity of goods
- block counterfeits
- reduce conflicts



FOR IMMEDIATE RELEASE

Hitachi and BTMU Start Proof of Concept Testing for Utilizing Blockchain Technology for Check Digitalization in Singapore

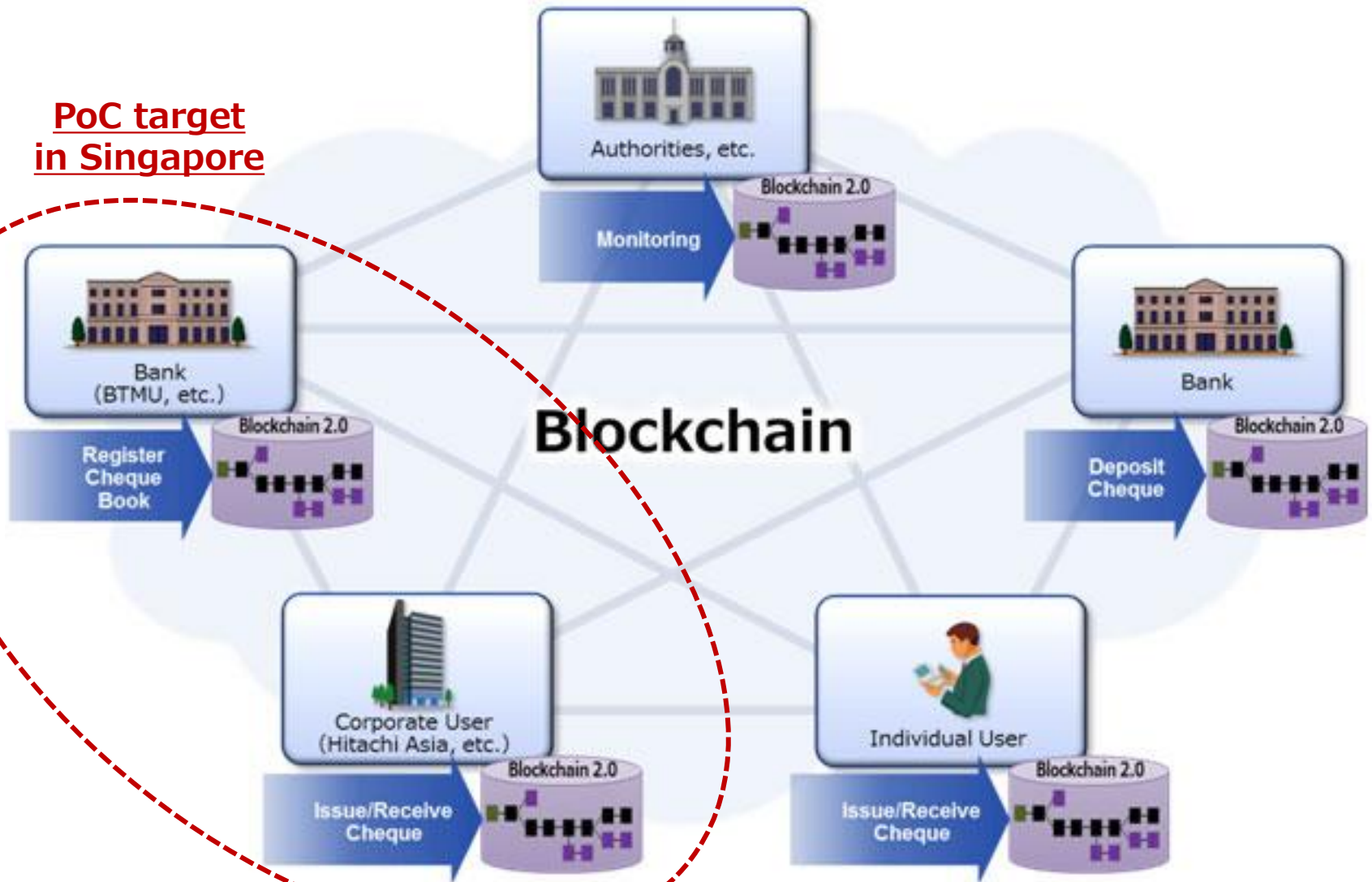
Singapore, August 22, 2016 --- Hitachi, Ltd. (TSE: 6501, Hitachi) and the Bank of Tokyo-Mitsubishi UFJ, Ltd. (BTMU) today announced that they have started Proof of Concept (PoC) testing for using blockchain technology^{*1} for digitalization of checks in the Republic of Singapore.

In this PoC testing, Hitachi and BTMU communally developed a system in which blockchain infrastructure are used for issuing, transferring and collecting electronic checks. Using the system, BTMU issues and settles checks and some of Hitachi Group companies in Singapore receive the electronic check and deposit the funds.

Through the PoC testing, Hitachi and BTMU will be able to identify issues from various perspectives such as technology, security, operation, and legal perspectives, and aim to realize new FinTech^{*2} services including digitalization of checks.

In recent years, various efforts towards providing new financial services that utilize blockchain technology and making financial services more efficient have been accelerated. Blockchain is a technology which makes difficult to tamper the data, sharing the data related to processes among multiple computers over networks. With

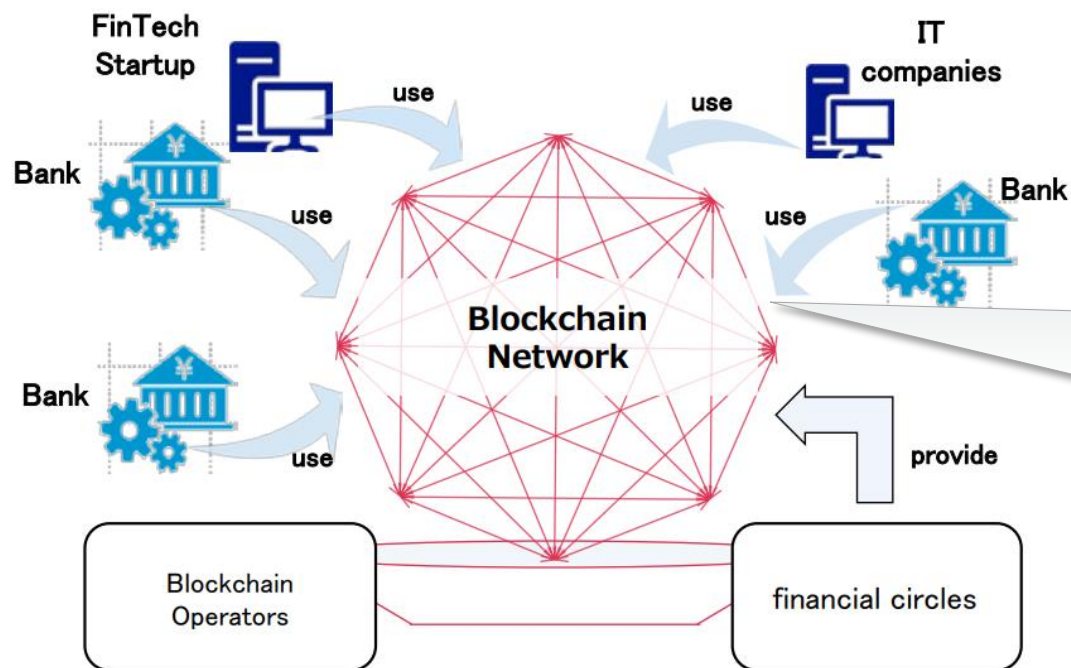
**PoC target
in Singapore**



JBA plans to provide “Collaborative Blockchain Platform” based on Hyperledger fabric for banking industry at Oct. 2017. It is aimed to make the cooperation and collaboration activities easier among stakeholders and reduce development cost of examination environments.

Hitachi is one of the partner vendors of JBA for this platform.

Image of Collaborative Blockchain Platform



Hitachi Blockchain PoC Environment Provision Service for Hyperledger Fabric

They have utilized our cloud platform powered by Hyperledger Fabric as their blockchain network basement.

(Note) Details will be deliberated in the banking industry

September 21, 2017

Hitachi, Ltd.

Mizuho Financial Group, Inc.

Mizuho Bank, Ltd.

Hitachi and the Mizuho Financial Group to Begin Proof of Concept Regarding the Utilization of Blockchain Technology in the Supply Chain management Field

Tokyo, September 21, 2017 --- Hitachi, Ltd. (TSE: 6501, Hitachi), the Mizuho Financial Group, Inc., (TSE: 8411) and Mizuho Bank, Ltd. will begin proof of concept (PoC) in October 2017, with the goal of advancing the utilization of blockchain technology¹ in the supply chain field.

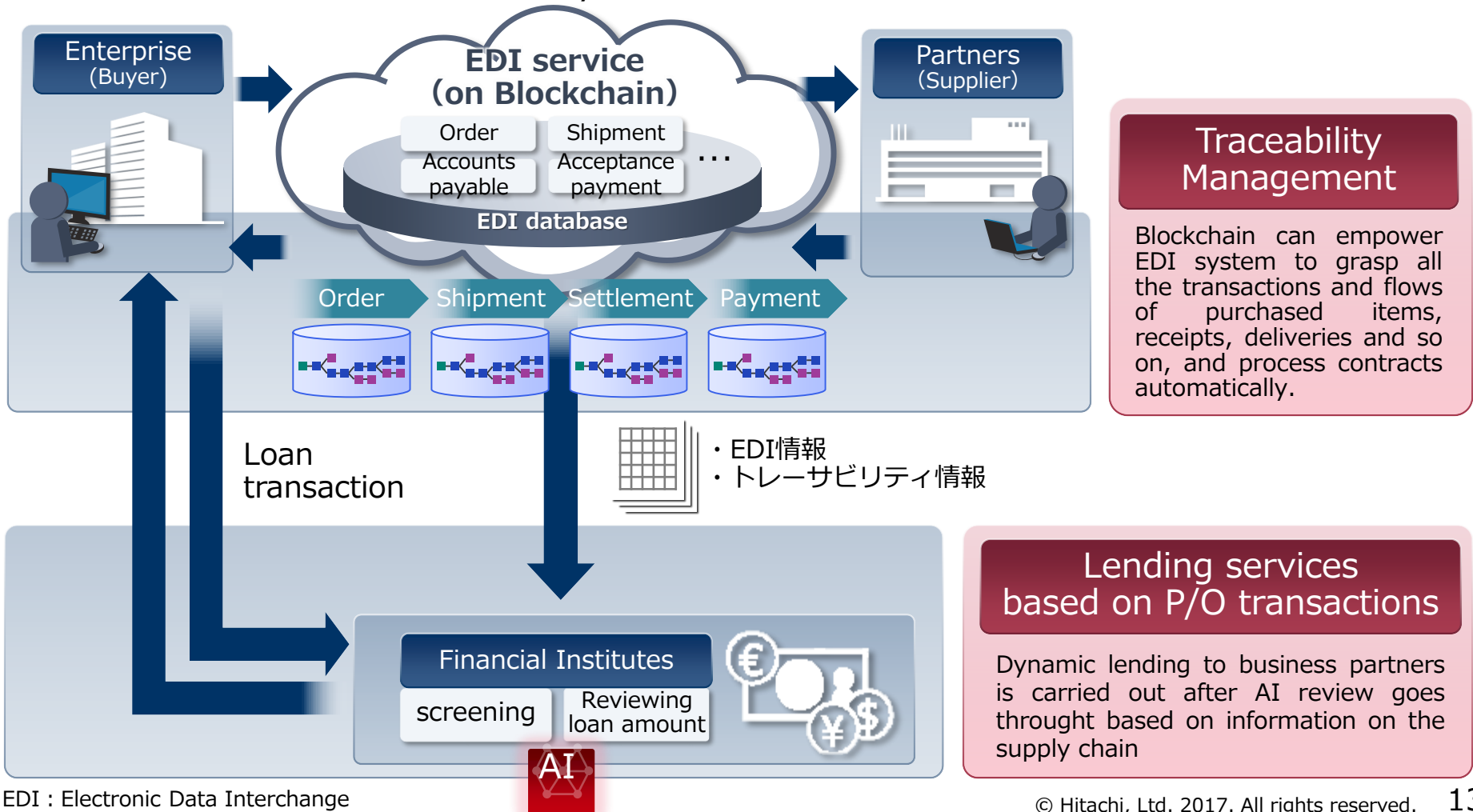
Through this PoC, Hitachi and Mizuho hope to work toward the implementation of blockchain technology in supply chain management systems, while also examining the future implementation of supply chain finance².

International procurement operations that span multiple countries involve the complicated task of managing information (ledgers) related to ordering and deadlines at each entity and for each business. Because it takes a long time to register orders, to reconcile order forms and invoices against each other for verification purposes, and to manage overall costs, these tasks have become an issue for many companies which procure internationally. By utilizing blockchain technology for procurement operations, ordering and credit data can be shared among sites and businesses, making it easy to understand the overall state of the supply chain. In addition, by recording information such as the supplier of each part, highly reliable traceability management can be achieved.

New App Proto.(1): SCM enabled by Fintech.

Future banking players can provide new financial applications for manufacturing industry by combining former EDI services /w blockchain and AI technologies.

Traditional business system + AI + Blockchain = New service



New App. Proto.(2): Information sharing b/w stakeholders in auto. and insurance industries

For automotive related market of USA., we have developed prototype app. for P2P information sharing system to support many stakeholders to process many of business steps automatically, such like making new insurance contracts, reports of accidents, claims, payments, etc.

Automobile Policy Blockchain by Hyperledger fabric

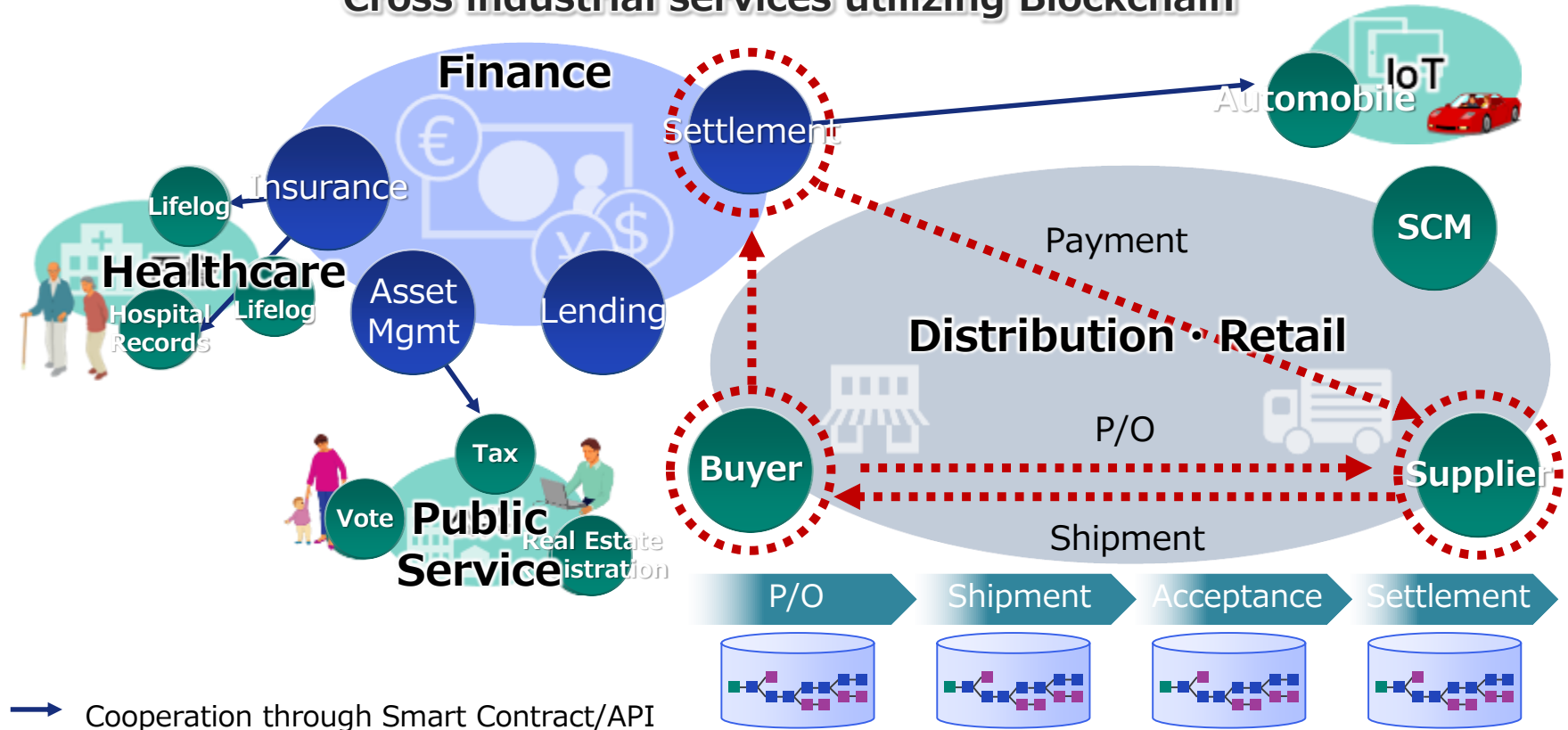
CATEGORY	ISSUER	NO	CONTENTS	DATE
Approve a Claim	North Insurance	630ANQT72R	Approved	2016-11-21 21:34:38
Make a Claim	Penguin Car Repair	630ANQT72R	Front Glass: 5/N 5BC-1029B-02L, \$800	2016-11-21 21:34:11
Accident Report	Alice	630ANQT72R	629F8Q6DXMFR448P9 / 6HLZQQBMSUF36MBT	2016-11-21 21:33:00
New Policy	Alice	629F8Q6DXMFR448P9	North Insurance Insurance, Plan:Gold, exp:6	2016-11-21 21:32:17
New Policy	Bob	6HLZQQBMSUF36MBT	South Insurance Insurance, Plan:Silver, exp:12	2016-11-21 21:31:53

Benefits of stakeholders (ex., our assumption) :

- DMV (Department of Motor Vehicles) can investigate vehicles if it is covered by insurance.
- Used-car dealer can prevent sellers from false reporting reviewed by repair history.
- The manufacturer can detect the deterioration situation of the parts before the failure occurs.

The wave of smartization of other industries is thought to enable business model transformation to connect different industries and solve social problems. It is expected to bring new business opportunities through direct chain transactions and information sharing between different industries via block chains.

Cross industrial services utilizing Blockchain



- Cooperation through Smart Contract/API
- Service/Function

“Smartization” of our society has been under development among connected industries to create new values and solutions for all people. IoT and smart contracts will be the key technologies for this world.

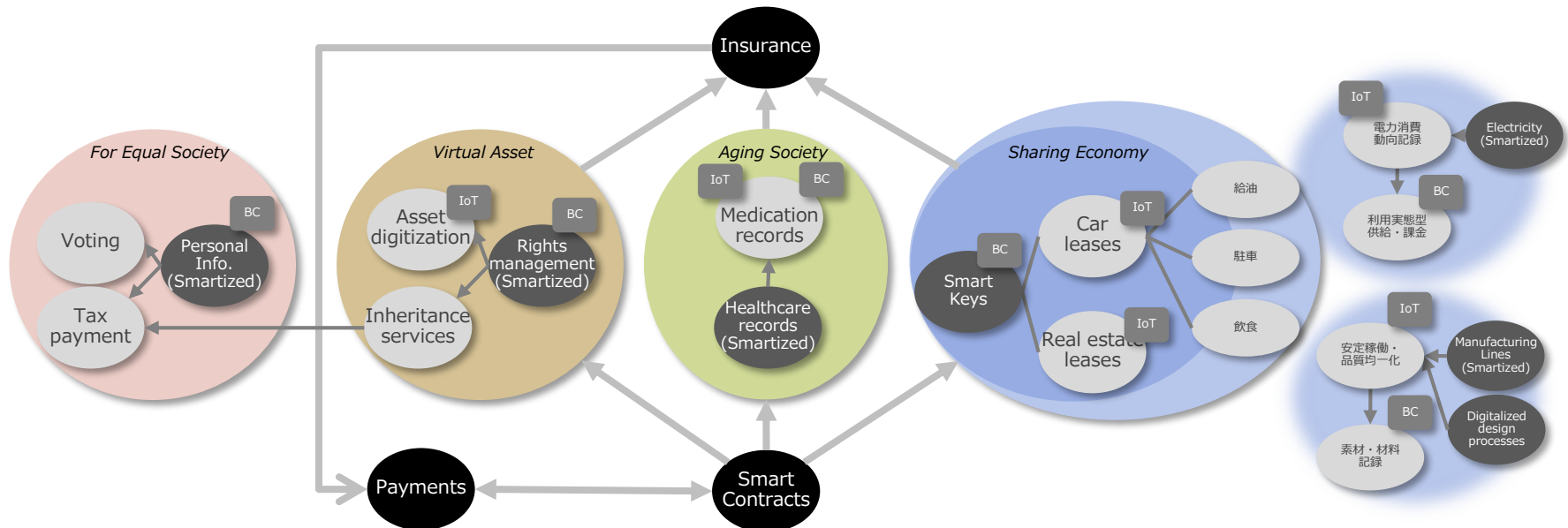
“Smartization” of our society

- Automated contract and payment caused by the rapid penetration of sharing and economy
- Tailored treatment and value-based medical care for reduction of medical expenses in aging society
- New rights management and business model for asset digitization era.

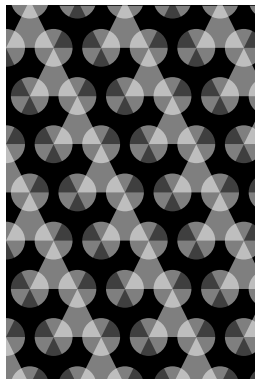
New user needs

All individuals are much responsible to their own credit decisions regarding to expansion the P2P transactions and purchase agreements.

They need new services to find out suitable partners for business and helps to make secure contracts.



We developed 11 typical pattern of Blockchain use case to find killer use cases interactively and collaboratively.



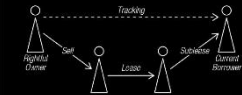
HITACHI
Inspire the Next

BLOCKCHAIN PATTERN BOOK

#01 RESELL/ SUBLEASE TRACKING

Traceability of resold/subleased items

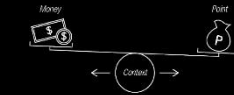
- It allows users to resale/rental values and enables to identify the current owner/contractor.
- The right holder can change/refuse the contract dynamically.
- Resale/rental conditions can be determined freely.



#02 ADJUSTIVE VALUE

Mutually adjustable value

- Sellers/buyers can mutually revise odds of value.



#03 SELECTABLE TRACEABILITY

Distribution route selection

- They can deal valuable things according to the route they come.



#04 SEAMLESS WALLET

Value exchange with mixed values

- Payment can be made with a mixture of money and non-currency.
- You can sum the values (currency, etc.) derived from different publishers while the transaction logs are kept.



#05 POSTPAY ALLOCATION

Allocation of payment between payers and payees

- You can automatically allocate payers and payees from actions and logs.
- You can pay for the results (not the processes).



#06 PURPOSE CONTROL

Restriction on non-purpose use

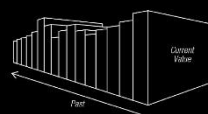
- Without ownership transfer, you can restrict user rights not to refer to items and information for intended purpose.
- You can track usage/reference history of values.



#07 STACKABLE VALUE

Guaranteed accumulated value

- Values can be kept and changeable by evaluation from sensors and certification authorities.
- You can refer to the reason causing the change of value.



#08 TEMPORARY CREDIT

Temporal adjustment of rights/permissions

- You can temporarily secure credit and grant constraint relaxations or additional rights to the specific users.



#09 MASHUP LEDGER

Mutual utilization of industry ledgers

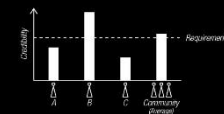
- By exchanging information recorded in the distribution ledgers in different industries, it is possible to provide new enriched services.



#10 COMMUNITY CREDIT

Community credit

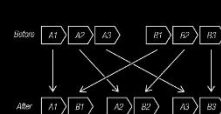
- Assure collaborative contractor's credit and enable complex collaborative contracts.
- Enable purchase/contract by joint guarantee and personal evaluation.



#11 UN/ RE-BUNDLING

Decoupling and reorganization for optimization

- You can disassemble the process and reassign subworks to the best partners.
- Similar works of different processes can be improved efficiently.



END



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