



# Introduction of Blockchain miyabi



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## miyabi

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# What is Blockchain?

Blockchain is the underlying technology that powers bitcoin, allowing it to function as a value transferring application. It is a new type of high-security database which achieves Byzantine fault tolerance in addition to distributed ledger technology. Blockchain is different from current distributed databases because it implements a hash chain and consensus algorithm.

## Distributed Ledger

A distributed ledger is a means of storing data across several servers rather than on a single server. Since the data in the ledger is distributed to multiple servers, the data will not be lost even if the data in one server is corrupted. A distributed ledger does not have a single point of failure and as a result, allows for high availability.

## Byzantine Fault Tolerance

A Byzantine fault-tolerant blockchain will continue working as long as the number of Byzantine nodes are less than a certain threshold. Legacy systems did not have Byzantine fault tolerances, and server corruption would result in the entire system being compromised. To prevent this kind of system failure, servers may have double or triple redundancy. However, the system still may not be completely resistant to hacking.

## Consensus Algorithm

A consensus algorithm is a rule governing the distribution of data between multiple servers. Setting a rule to reach consensus in advance allows for the elimination of data manipulation and illicit transactions.

## Hash Chain

A technology used for the prevention of data manipulation on a distributed ledger. It is constructed of data "blocks" which are connected in a line to form a "chain."



# Feature of Blockchain

## Resistant to data tampering

The transaction data in the blockchain is stored in the block which are connected one after another. Since future blocks are dependent on the data previous blocks, when past data is manipulated all the data that follows must also be updated otherwise there will be transactional inconsistencies. This leads to a high degree of tamper-resistance.

## High transparency of recording data

To record the data in the blockchain, the authenticity of the writer must be verified. Because data records are always checked by all participants, data management with high transparency can be achieved.

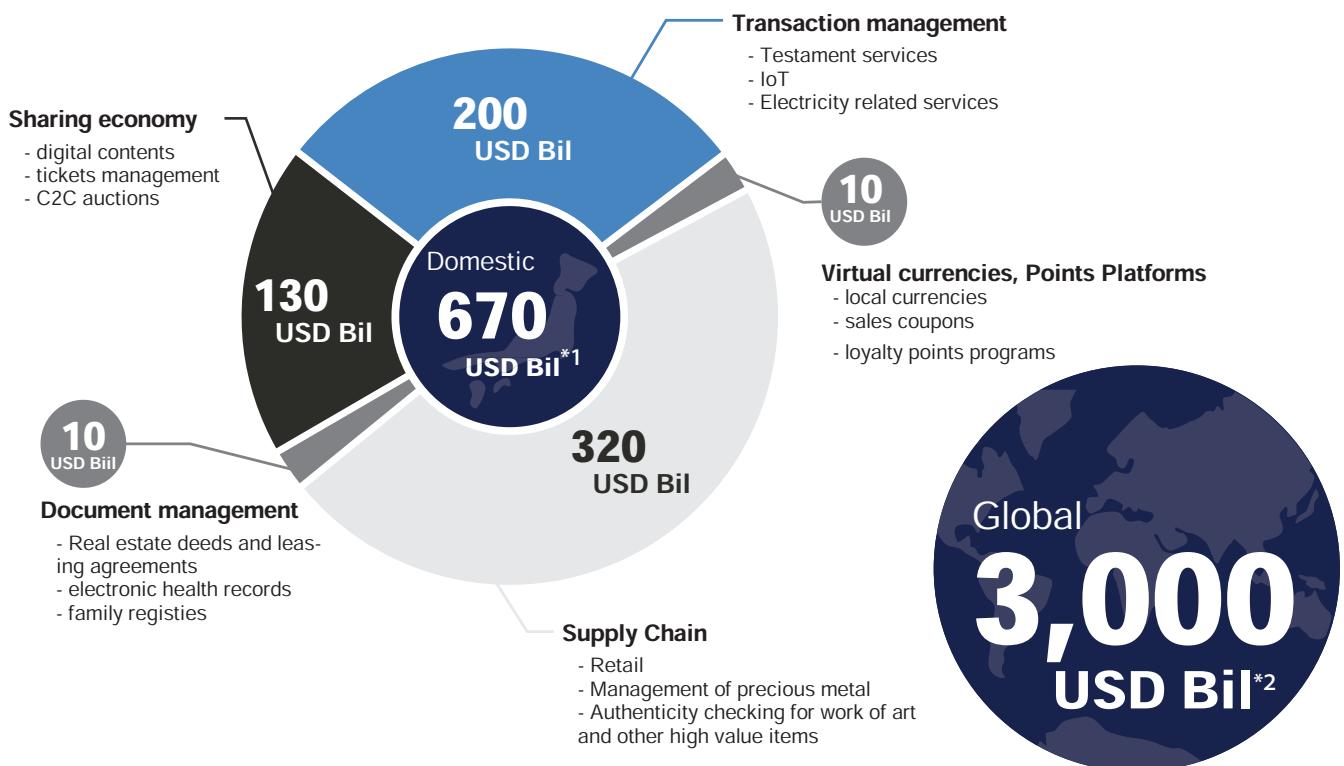
## Automation of transaction execution

Many types of operations along with data processing can be automated on the blockchain by creating programs which interacts with transactions. Secondary transactions or escrow transactions can be performed by using blockchain.

## Blockchain technology applications

Although there are only few use cases in Japan, blockchains are still widely used globally.

### Estimate of the size of the industries impacted by blockchain in 2030 (1 USD=JPY 100)



\*1 Source: "平成27年度 我が国経済社会の情報化・サービス化に係る基盤整備" METI (April 28th, 2016)

\*2 Source: "Forecast: Blockchain Business Value, Worldwide, 2017-2030" Gartner (March 2nd, 2017)

# Types of Blockchain

## Private Blockchain / Consortium Blockchain

There are administrators on the blockchain and those administrators make decisions. There are many benefits to using them, for example, it is easier to reach consensus and throughput is relatively high compared to public Blockchains. Therefore, it is used by corporate clients as the enterprise blockchain solution.

## Public Blockchain

There is no administrator on the blockchain and anybody can freely join the network, browse records and approve transactions. Since the network is decentralized, data manipulation becomes more difficult as more participants join the network.

	Public	Consortium	Private
Administrator	None	Multiple companies / Organizations	Single
Network Participation	Free	Registration required Single	Registration required Single
Consensus Algorithm	Mining (PoW / PoS)	Voting / Authenticity	Self-approval
Restriction of transaction browsing	No restriction		Can be restricted
Use case or application	Virtual currencies		Supply Chain Transaction management Sharing economy Wire transfer etc
Platform/Product	Bitcoin Ethereum		 miyabi Hyperledger fabric Enterprise Ethereum Alliance



# What is miyabi?

"miyabi" is bitflyer's original blockchain. By applying the characteristics of blockchain, we have been able to transform a public blockchain into a consortium/private blockchain by removing the public blockchain pain points.

## Incredible speed compared to public blockchains

By using our original consensus algorithm, we have been able to reduce the time for transaction approval (adjustable between 1-4 seconds) and achieved the highest standard throughput (1,500-4,000 tps)

## Securing finality

Public blockchains only have a slight possibility to nullify the past consensus. Since miyabi uses its own original consensus algorithm, an authenticated transaction will be permanently finalized.

## Customization

As there is a flexible smart contract, it can be customized so that the blockchain can be utilized for various operations.

## Securing the safety of transactions

As miyabi can detect abnormal transactions before it creates a block, it secures the safety a distributed ledger.

# Superiority of miyabi

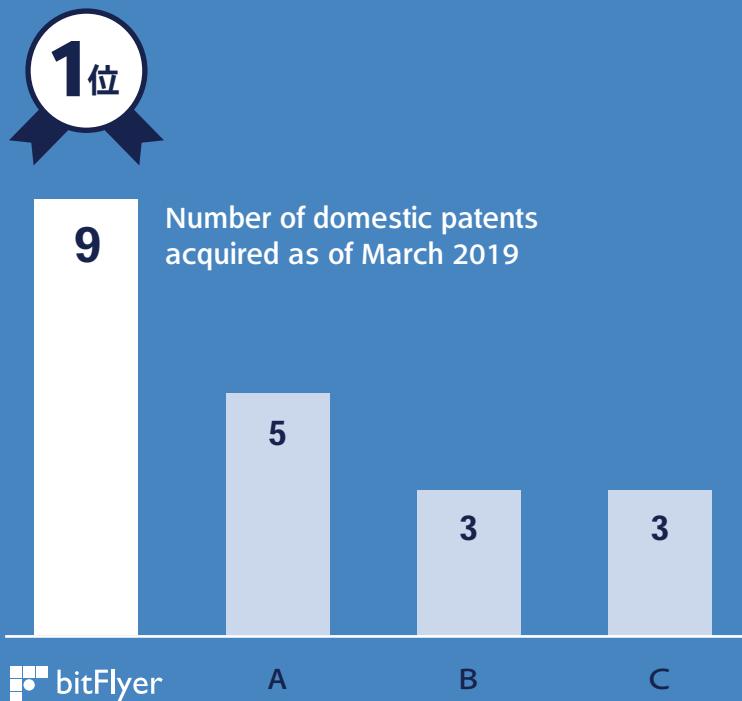
## Deep understanding of blockchain

### Experiences in the development and the operation of cryptocurrency exchange

As Japan's No.1 cryptocurrency exchange with the largest volume<sup>\*1</sup>, we gained the experience and cutting-edge knowledge about how blockchain truly functions and how we should manage it through the development of wallet services and daily operations for trading.

### Patent for blockchain-related technologies

During our research, we have obtained patents by changing ideas and understanding to utility model. The number of blockchain-related patents we possess is one of the highest in Japan.<sup>\*2</sup>



<sup>\*1</sup>: based on research by Bitcoin Japan. Then number is from Nov. 2016 to Nov. 2018. It is the total volume including actuals trading, leveraged trading and derivatives.

<sup>\*2</sup>: researched by us. The number of patents which includes the word "blockchain" in the name of utility model, explanation, and claims. We excluded the patents which had been taken before Satoshi Nakamoto announced his thesis in 2008.

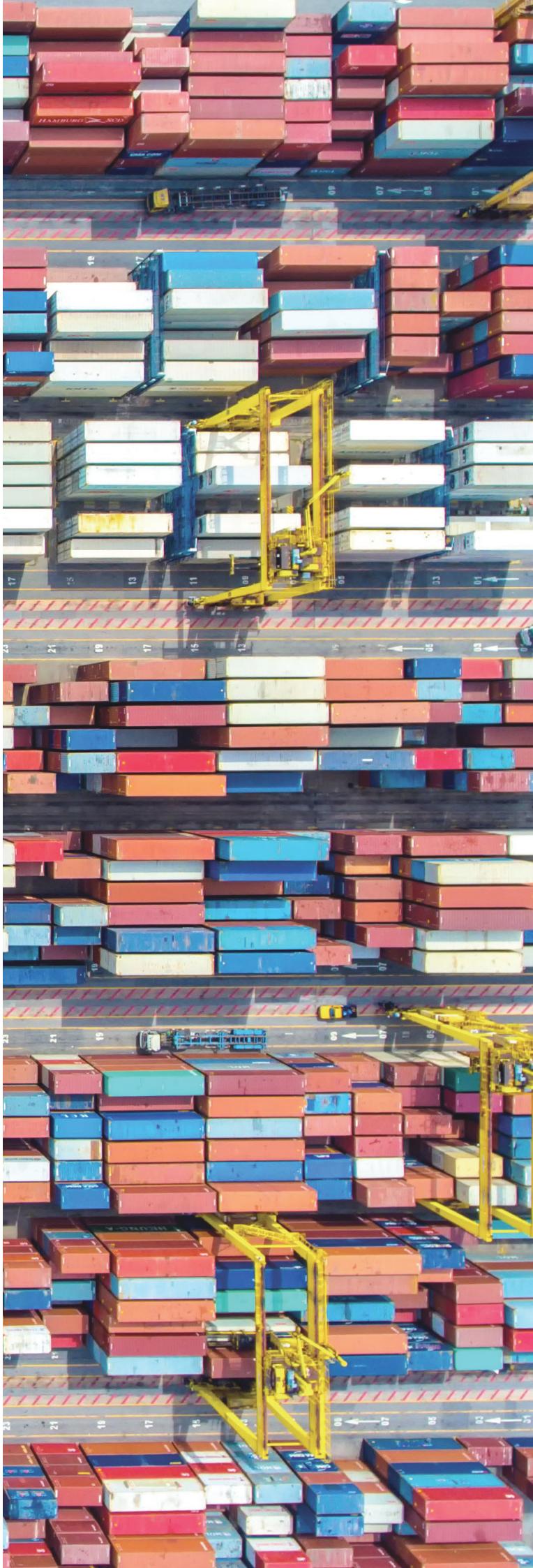
### Best in class capabilities and performance

as of March 12th, 2019

Architecture (Type of blockchain)	<b>Consortium / Private blockchain</b>
Consensus Algorithm	<b>BFK2</b>
Network Participation	<b>Approval required</b>
Finality	<b>Yes</b>
Smart Contract	<b>Yes</b>
Throughput	<b>4,000tps at maximum Read time until the block is finalized</b>
Read time until the block is finalized (Latency)	<b>1-4 seconds Default 4 seconds (adjustable)</b>

# miyabi's Solutions

miyabi's various use cases allows us to provide a solution to suit your needs





## Coin Solution

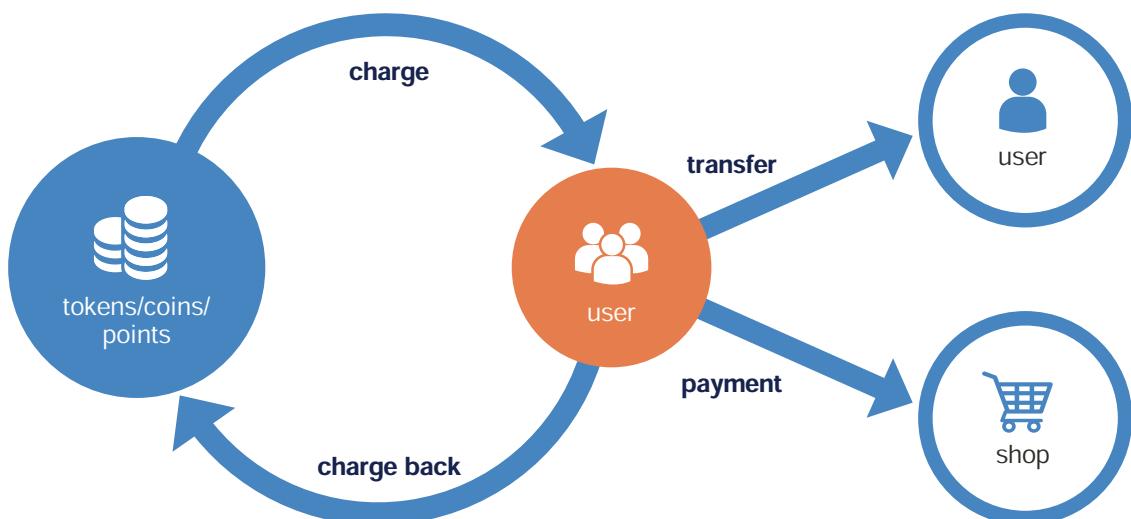
Issuing tokens/coins/points and transferring them

You would be able to issue and transfer your original tokens/coins/points to your employees and clients immediately without a significant investment.

### Estimated use case

- | Internal coins / benefit packages
- | Real-time transactions between corporate clients
- | Points or royalty programs which could be used to your clients on EC sites or retail stores

### Coin Solution overview





# KYC Solution

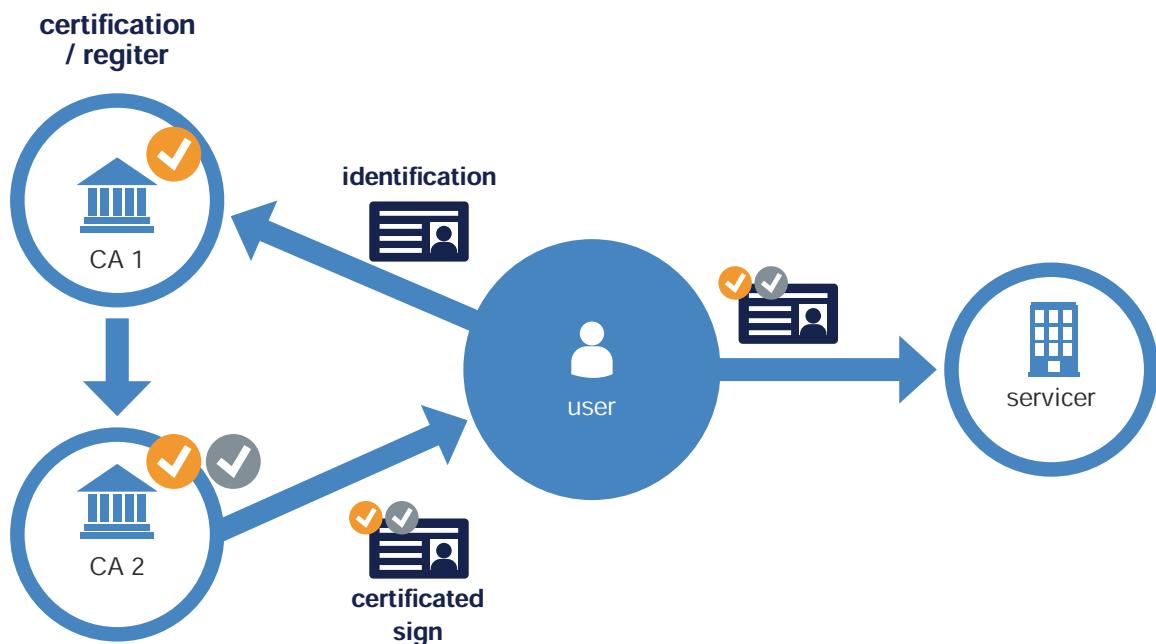
KYC platform which could be used across multiple companies

By participating a network which enables access to the certificate authority that holds KYC information on behalf of corporate clients, it is possible to improve convenience and streamlining of KYC operations.

## Estimated use case

- | KYC when buying/selling real estate
- | Opening accounts for financial institutions

## KYC Solution overview





# Smart Contract Solution

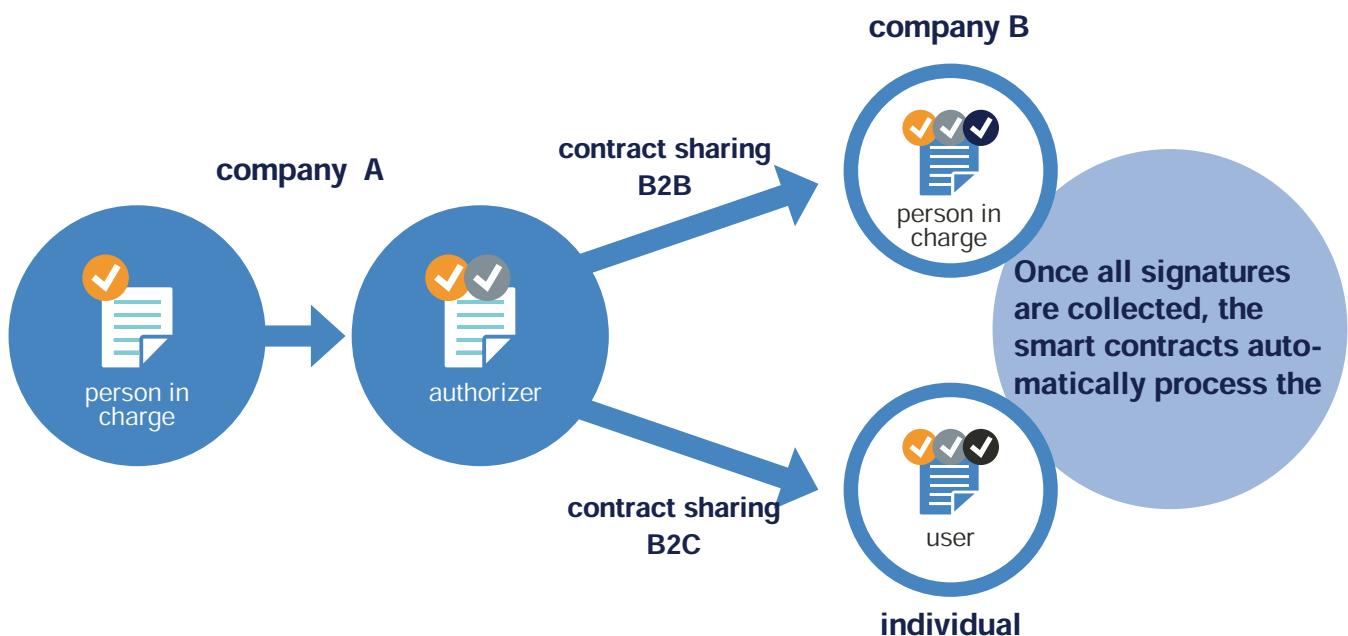
Electrify internal approval and contracts by using electronic signature

By protecting the data from tampering, it streamlines the process of internal approvals and eliminates paper-based communication.

## Estimated use cases

- Related to contract conclusions

## Smart Contract Solution overview





# Traceability Solution

Certification of raw materials and manufacturing processes in supply chain

By recording the process from the procurement of raw material to sales, it is used to certify the quality of products. It may also be used for audits as well.

## Estimated use case

- | A food maker can certify the quality and safety of the product through a QR code
- | Certification for land of origin of conflict minerals when submitting the report

## Traceability Solution overview





# Intellectual Property Solution

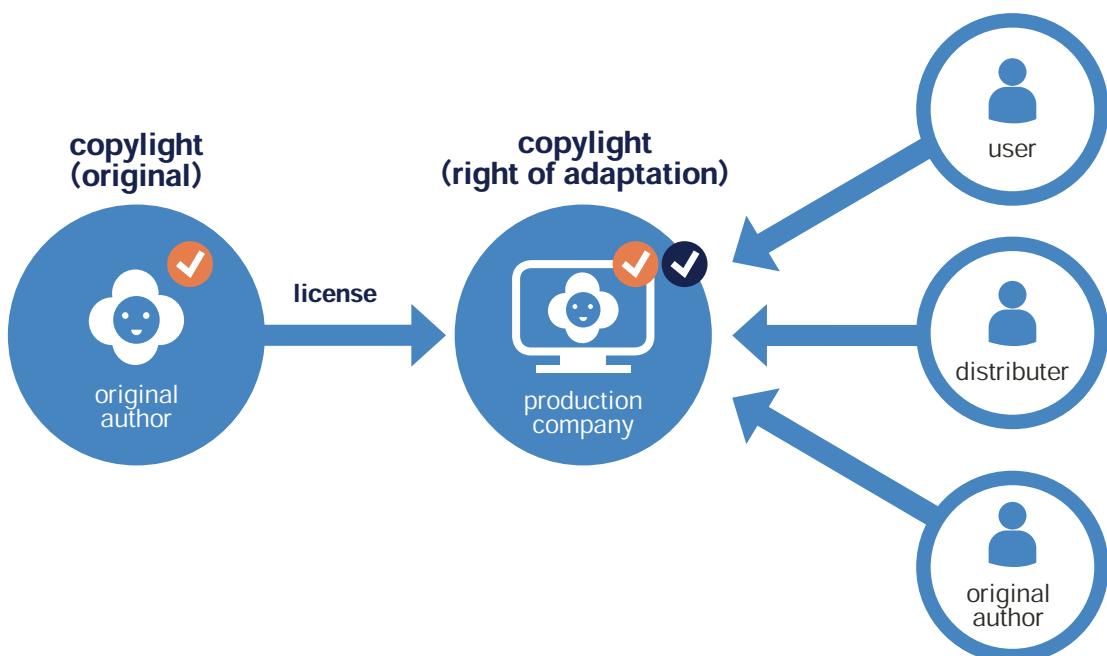
Certifying and securing the transparency of intellectual property rights

It enables to management the intellectual property right by making the process transparent

## Estimated use case

- To manage the copyrights of movies and music which would be used in program production and game creation, and the copyright of photographs which would be used for advertisements and articles.

## Intellectual Property Solution overview





# Open Data Solution

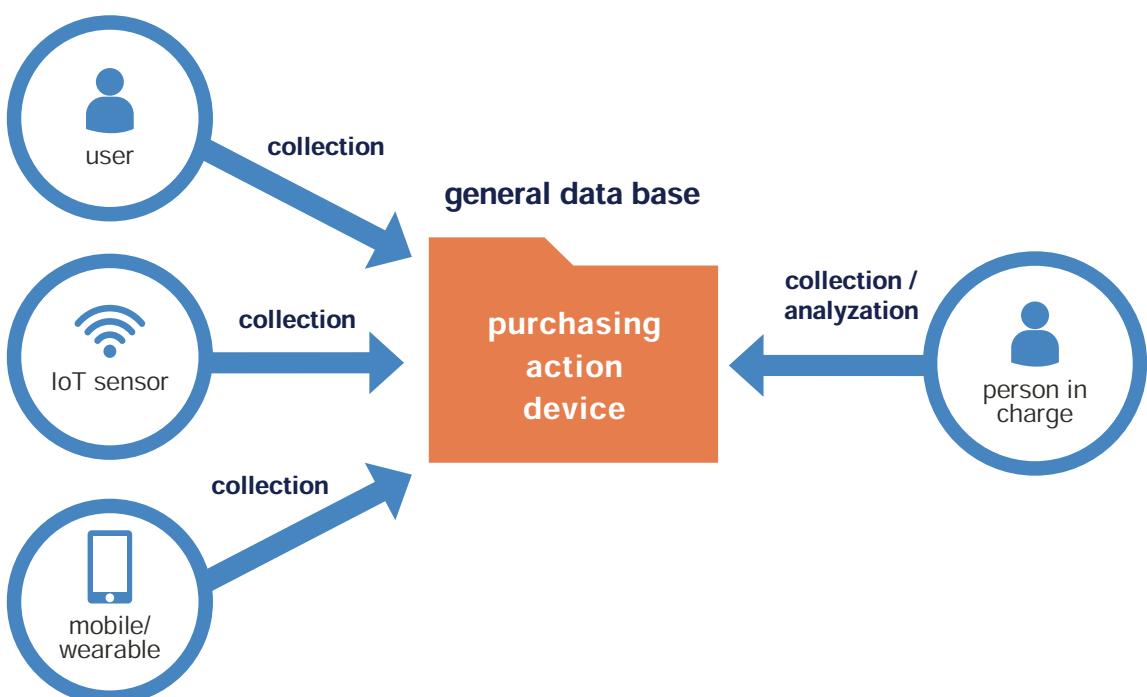
## Big data collection and application platforms

The database which could certify the all data sources can be utilized in many ways such as digital marketing and IoT analysis.

### Estimated use case

- | Segmentation information analysis for data marketing
- | Insurance services which are provided according to clients' health data
- | Optimized production and efficient sales order management for manufacturers

### Open Data Solution overview



## Case Study

miyabi has already been used in several industries. One of Japan's top corporate clients uses them for daily operations and services. Here is a preview of what we've done.



## Production

### Sekisui house

#### Rental real estate management

It is the first project to manage real estate information with blockchain technologies. Rental property information can be browsed via miyabi. In addition to the property information, owner information, contract information, rentee information is recorded. Also, such activities as information, payment reports for house rent are recorded. There are plans to record repair and renovation information in the future as well.

We are also considering to form a consortium across different industries as well as cooperating with other real estate related companies.

### Insurance company

#### Insurance office work

The communication between operation centers and sales offices used to be paper-based, such as using Fax which was extremely time consuming. miyabi has replaced the paper-based communications, and operations have been streamlined. As a result, issuing insurance policies has become much quicker than in the past, and the risk of information leakage and loss has been minimized. Operating costs have been reduced as well since there is no need to maintain a security infrastructure anymore.

### Manufacturer

#### Internal coin

Handling digital currencies using miyabi. Transferring, transactions, charging coin and charge backs have been achieved through miyabi. The client is aiming to use digital coins for inter-company transactions, sharing services, leases, and tokenized securities. The client expects to develop a lot of business by using blockchain.



## PoC

### Japanese bankers association

#### A platform for PoC

bitFlyer has provided a platform for PoCs so members can conduct their own PoCs using the environment.

### Travel company

#### Blockchain data management

bitFlyer designed the architectural system to reduce the burden of information management which required operators to gather information scattered in each service system.

### Internet bank

#### Financial platform with digital currency

An infrastructure to manage coins to enable money transfer, factoring, contract management, and risk management.

### Prepaid card company

#### Prepaid card Payment

Developed a system to substitute magnetic cards with an expiry date. Issuance of the cards, balance charges, and payments at the retail store were achieved by using blockchain.

### General trade company

#### Renting property management platform

Designed a platform to manage KYC, explanations of important notices for renting a property, lease contracts, and activity data utilization.

### Trust bunk

#### Housing sales contrat

Designed a platform to prepare housing sales contracts, to process until the execution by using blockchain.

### Blockchain study group

#### Domestic trasfer

Developed a system to make domestic payments between banks by using blockchain.

### Insurance company

#### Anti-social power information management

Designed a system to share information of anti-social organizations with multiple financial institutions so they may create new ecosystem for information sharing.

### Real estate company

#### KYC

Designed a system to issue a certificate for electronic signatures so that the company may operate as a certificate authority.

### Mass medium

#### TV coin

Designed a system to provide coins and coupons during the TV shows to collect marketing data.

### Telecom company

#### Insentive points

Designed a result-reward system for sales people to incentivize them through points.



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\* This document is intended to give an overview of the blockchain and introduce our blockchain business. It is not intended for solicitation in the Group's virtual currency exchange business.  
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