Data Governance

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DataPorts
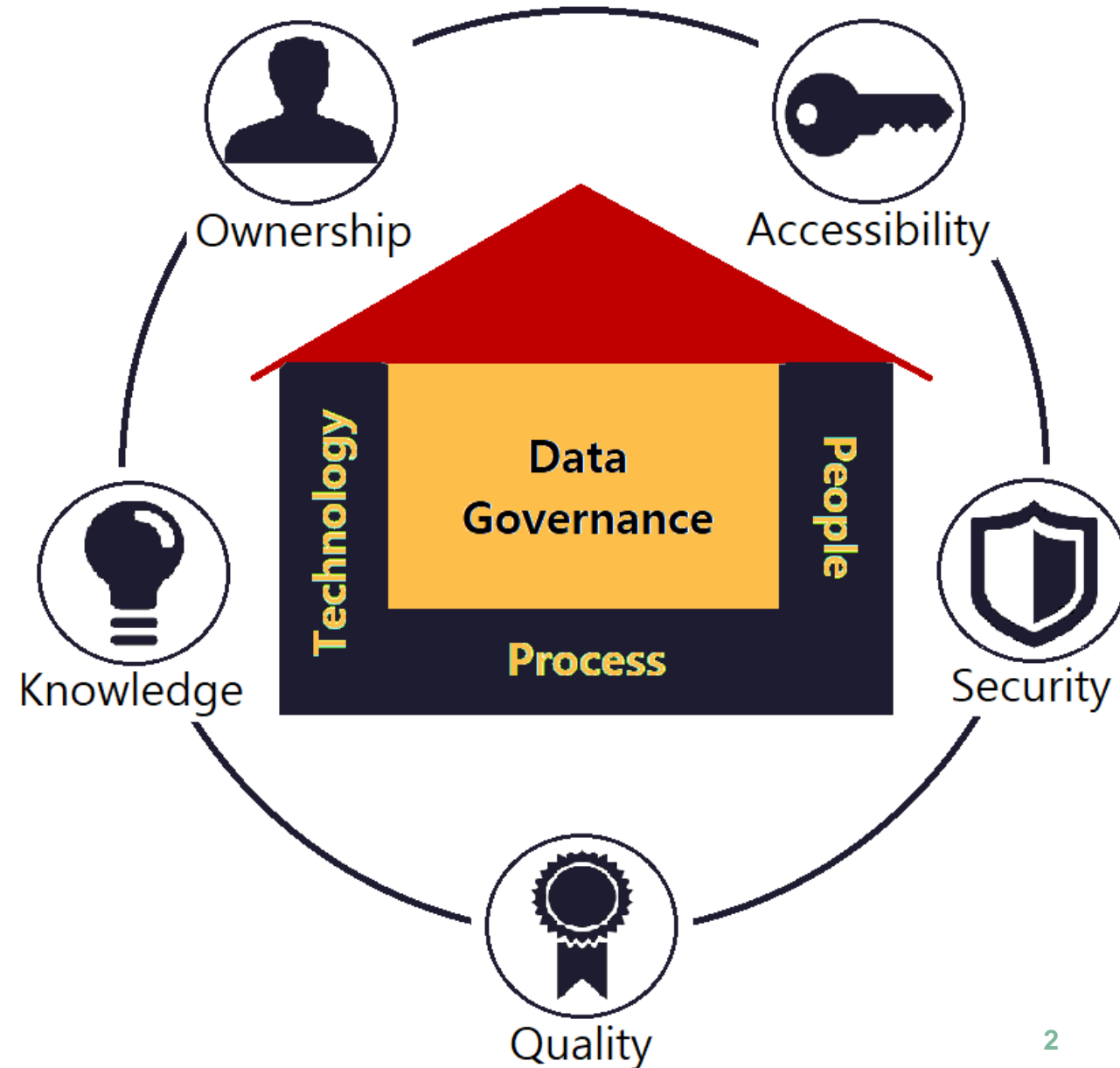Data Platform for the
Connection of Cognitive Ports

29th November 2022

Objectives of Data Governance

- Data governance is a mechanism that enables the *enforcement of access rules* to business data assets in a **transparent**, **verifiable** and **non-repudiable** way

- Data Governance increases confidence in the registered data, all the while ensuring data sovereignty

Blockchain for Data Governance

- The aim of including **data governance** in DataPorts is to provide a secure platform for defining **data sharing rules** for ports operations

- A **blockchain network** can effortlessly provide the features needed for a data governance platform

- Taking advantage of blockchain features, it is easy to define **data ownership** and have a foolproof way for participants to mutually agree to **data distribution policies**

Blockchain main concepts

Append-only distributed system of records, shared accross business network

Shared ledger

Smart contract

Business terms encoded in a computer program and executed as part of a transaction

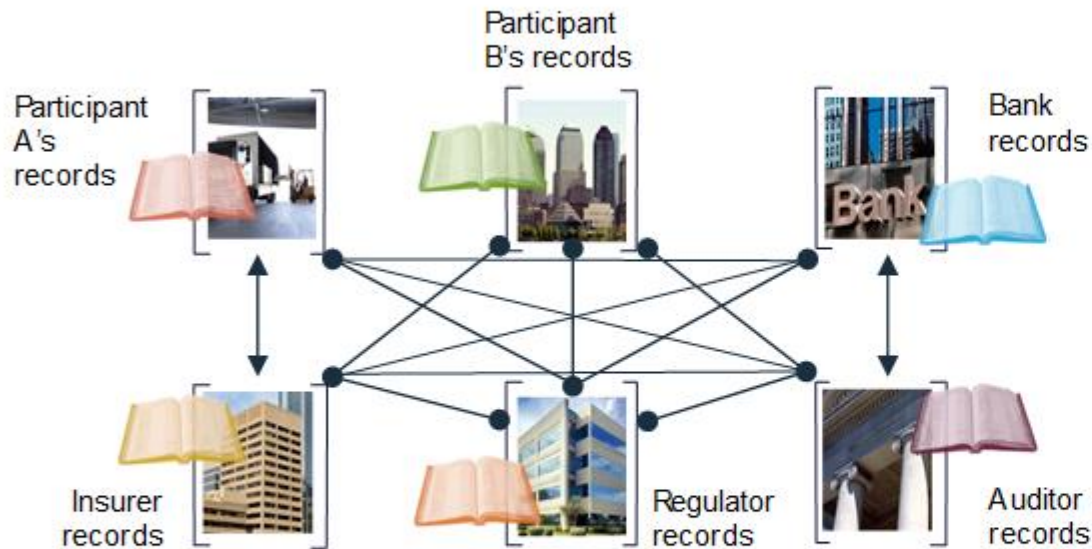Transactions are secure, authenticated and verifiable, thus ensuring appropriate visibility

Privacy

Consensus

A critical number of participants agree on the validity of a transaction
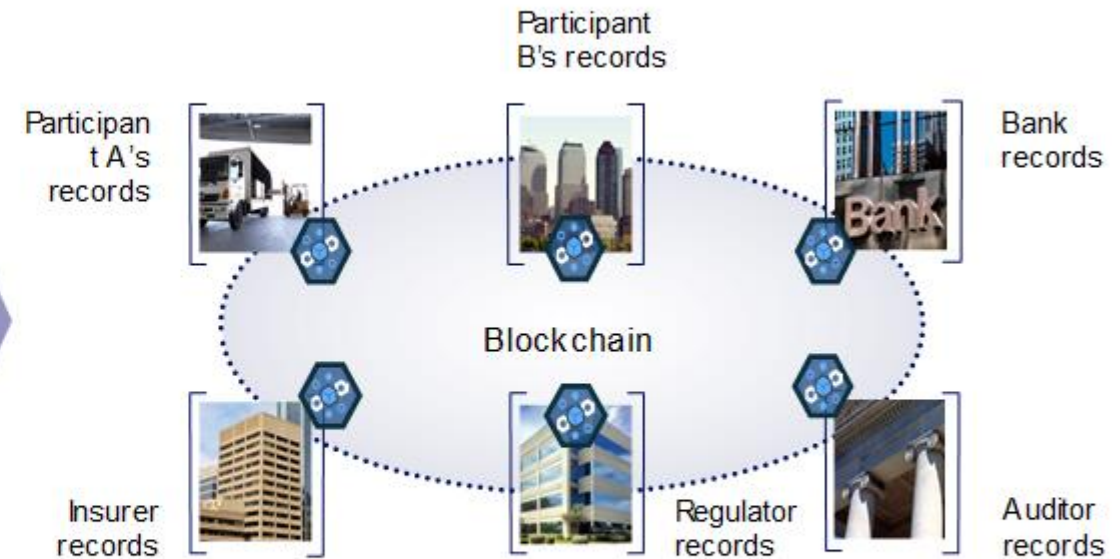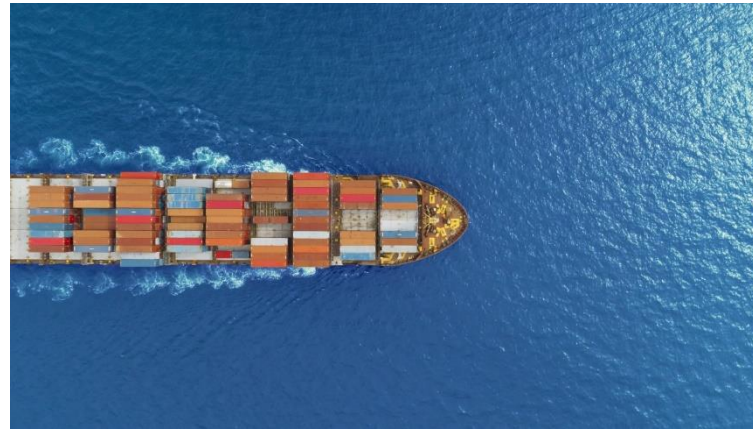
Blockchain in business processes

Data exchange challenges in Maritime

- **Data** are in **silos**. Information is exchanged in a bilateral manner and is held in various paper and digital systems.
- **Processes** are **time-consuming**, as they are mostly **manual** in nature, and many **exceptions** exist that have to be dealt with to keep operations going.

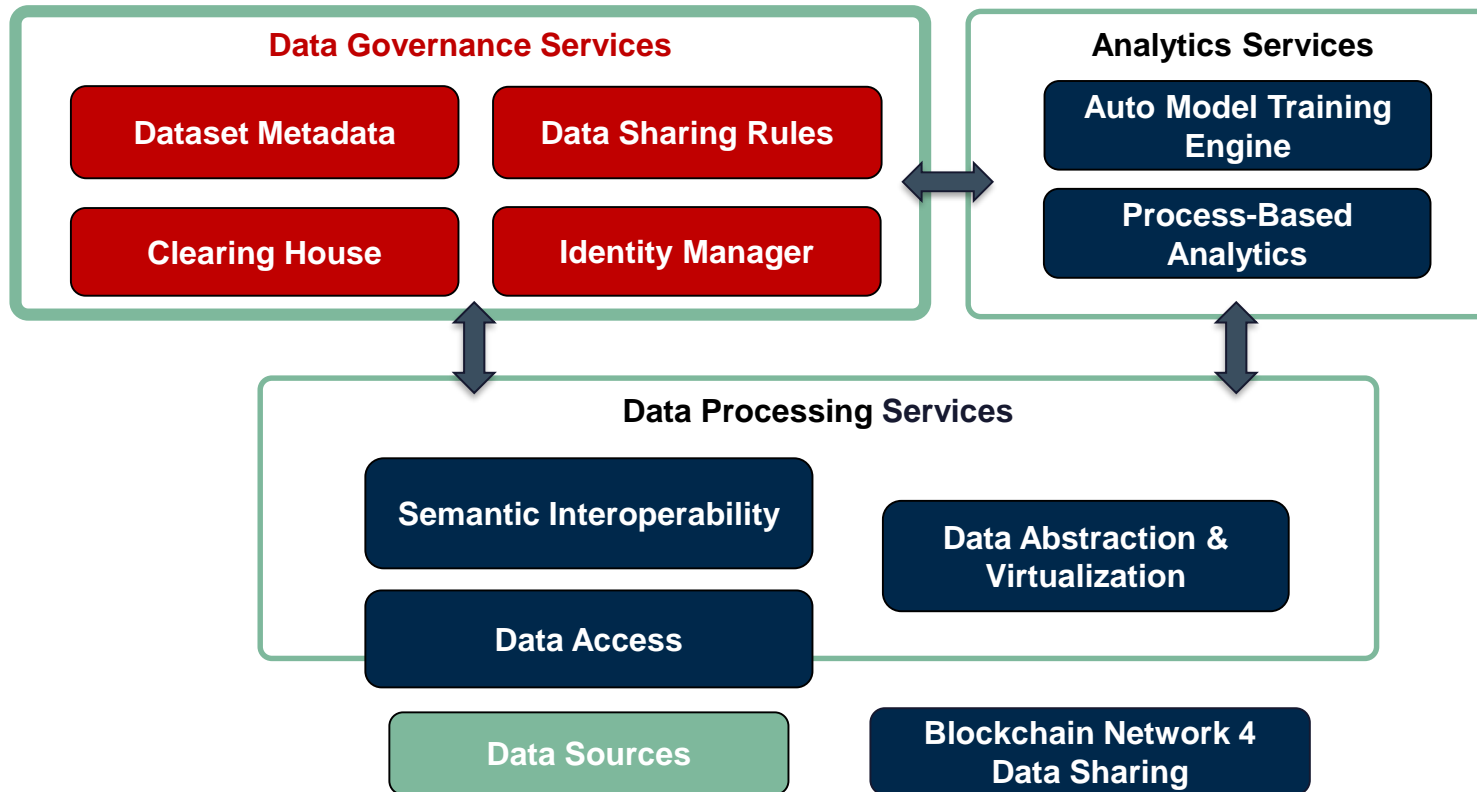# Impact of blockchain-based DG in Maritime

- **Blockchain** can help to transition from a bilateral model to exchange information to a decentralized. The relation from one-to-one is turned to one-to-many.
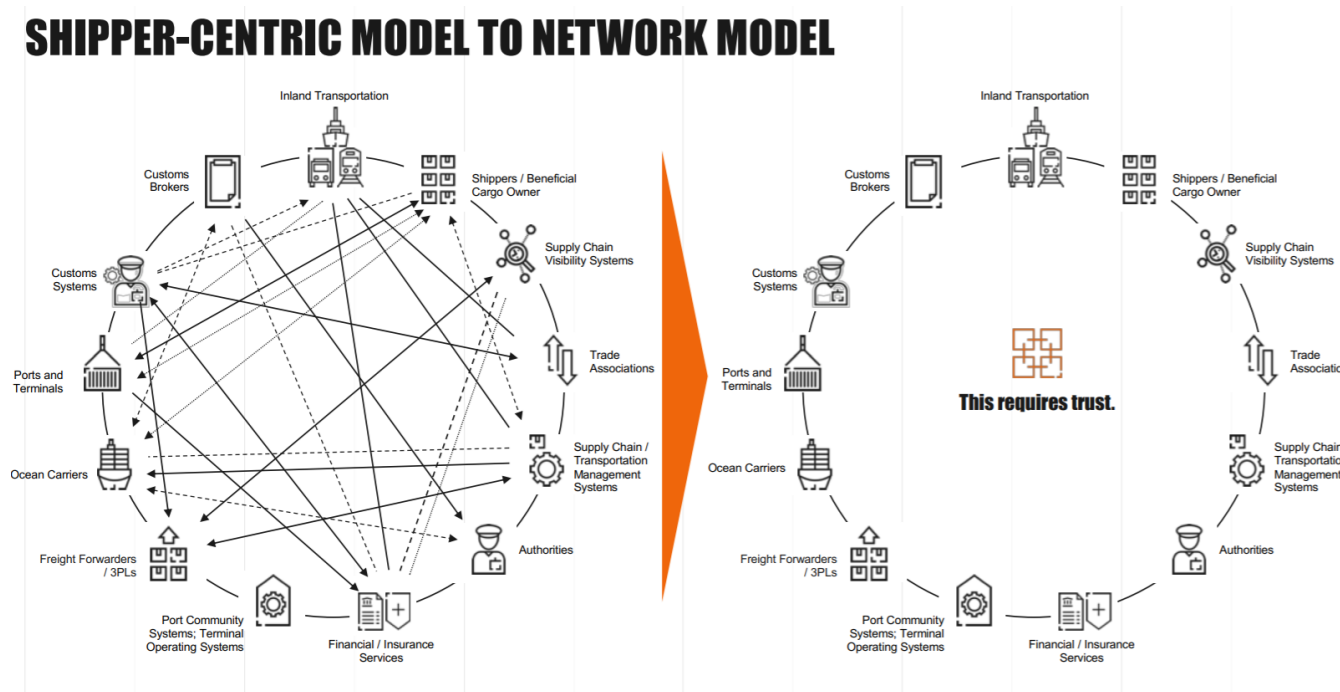
Traditional vs Blockchain
Source: Musienko, Yuri. December, 2019. MAERSK Blockchain Use Case.

Position in the Platform

Data Governance Services

Dataset Metadata	Data Sharing Rules
Clearing House	Identity Manager

Analytics Services

Auto Model Training Engine

Process-Based Analytics

Data Processing Services

Semantic Interoperability

Data Abstraction & Virtualization

Data Access

Data Sources

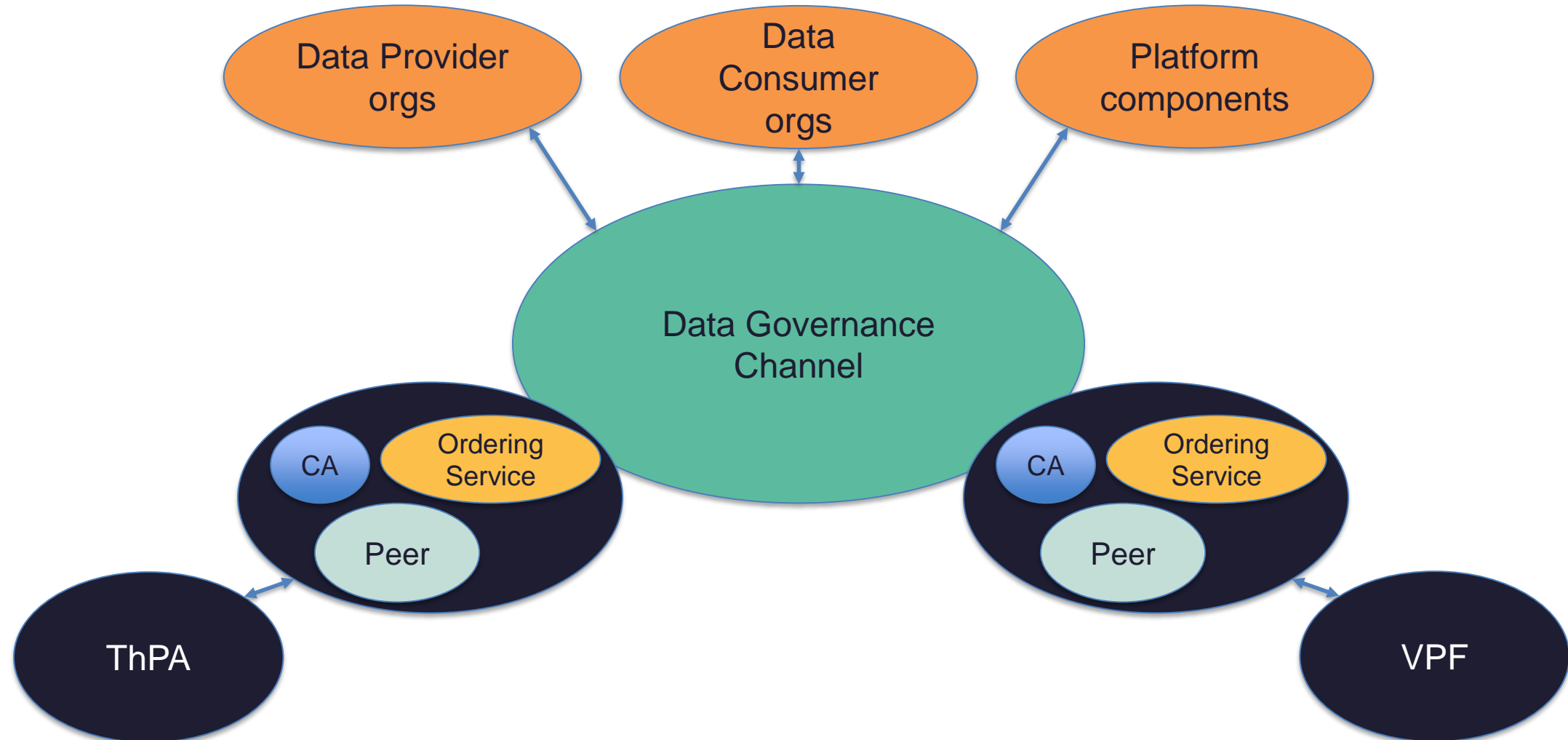Blockchain Network 4 Data Sharing

Technologies

- Blockchain Network based on Hyperledger Fabric

- Hyperledger Fabric SDK for Node.js

- Storage state of transaction: CouchDB

- Smart contracts to allow/deny access to data and store transactions: Go

Blockchain architecture

- The Data Governance component follows the Hyperledger Fabric architecture model.

Subcomponent layers

- A network participant performs the role of data provider when it provides data to others and performs the role of data consumer when it collects data from others.

- Participants in the DataPorts ecosystem can potentially interact with the blockchain to perform any of these actions: upload metadata of a dataset and define the access rights to it, search for datasets and request access to an existing dataset, revoke access to an uploaded dataset, and view audit log of registration and access of datasets.
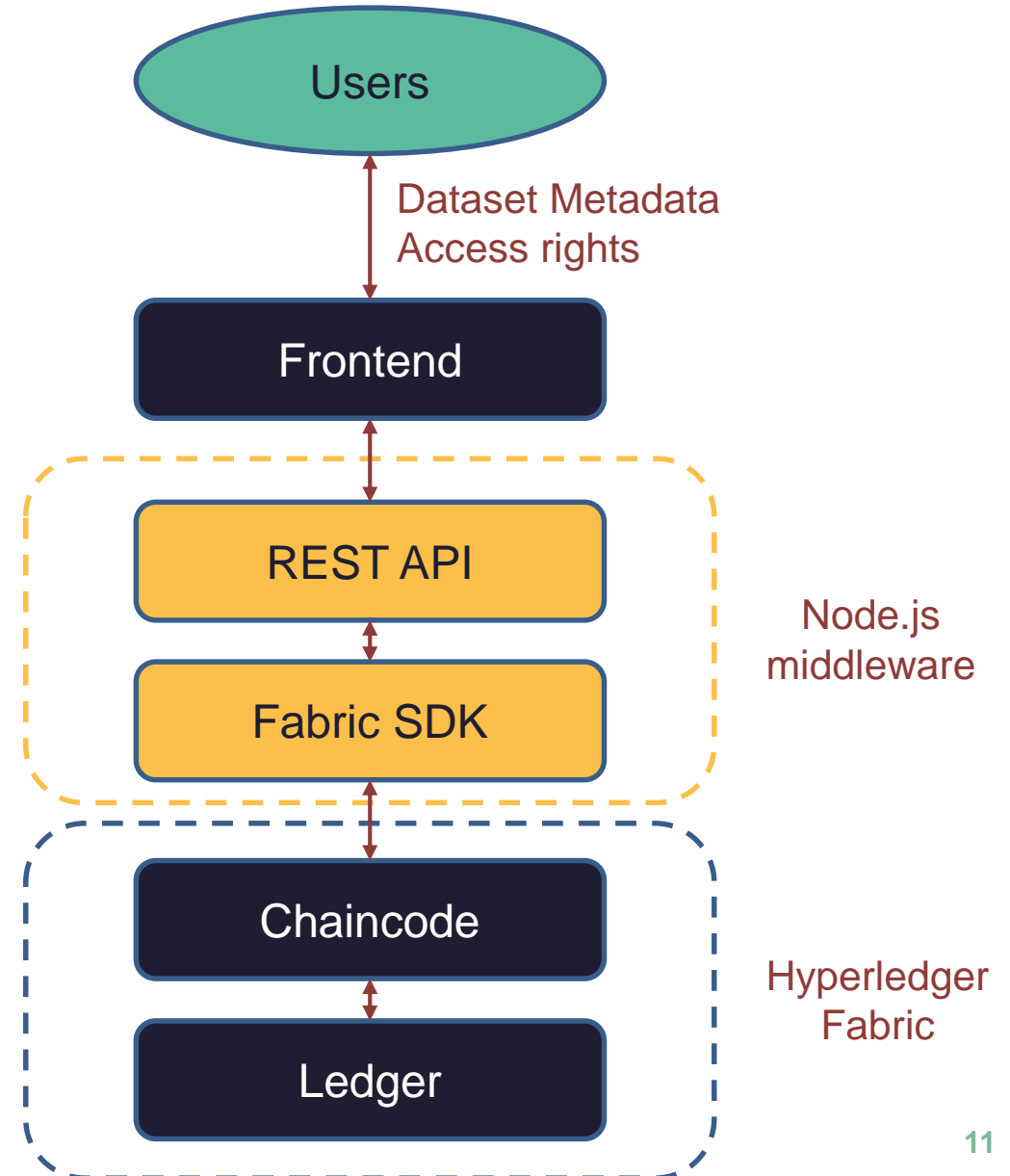
Thank you for your attention

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