



International Cross-Industry Data Sharing for Realizing Carbon Neutral, Resource Recycling and SDGs

Koki Mitani

The Rise of New Values for a Sustainable Future

In today's world, these new values are emerging as key drivers of a sustainable future.

Climate and Carbon Neutrality



- From a regulatory standpoint, companies are required to disclose and reduce greenhouse gas emissions throughout the entire supply chain.
- To encourage emissions reduction, the implementation of carbon pricing mechanisms has become essential.
- Improving energy efficiency and optimizing operations are critical management priorities in both product development and overall business processes.

Circular Economy



- Regulations require manufacturers to disclose reports on the total amount of chemicals contained in their products and the recycling rates.
- Across the entire supply chain, there is a need to establish a traceability system for products. This system should cover everything from natural resource extraction and manufacturing to sales and product use, all the way through to recycling.

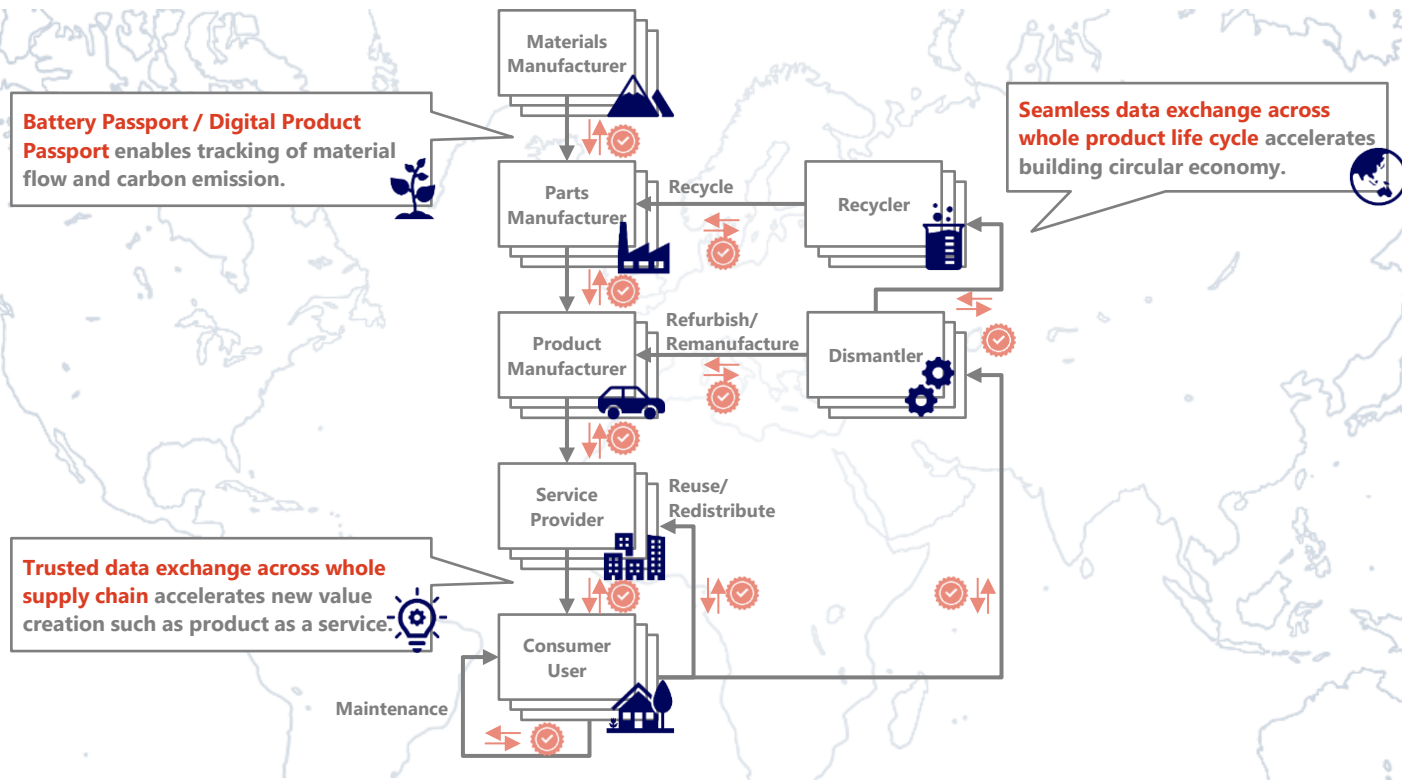
Human Rights and Compliance



- In regulatory contexts, transparency and reporting on diversity, social contributions, and compliance information are required.
- Due diligence on human rights across the entire supply chain is necessary.
- The ethical stance of a company impacts consumer purchasing decisions.

Data Spaces – Enabling Data Sovereignty Across Use Cases

Data spaces enable trusted data sharing across global value chains while protecting data sovereignty — the right of each data provider to decide how their data is shared and used.

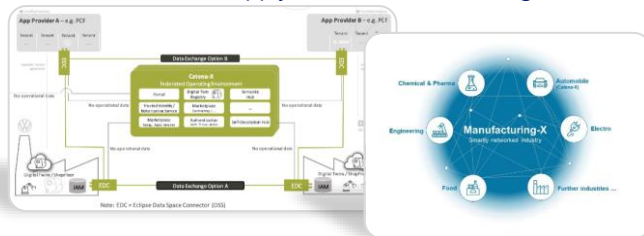
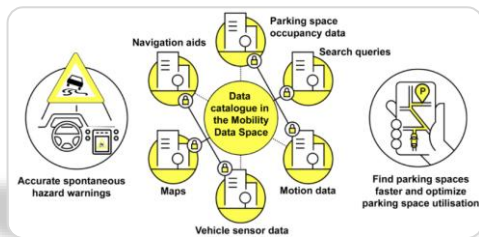


Data Spaces Need to Be Interconnected Globally

To support a globally connected value chain, they must be interconnected based on rules and standards.



Mobility Data Space (Mobility)



Smart Connected Supplier Network (Supply Chain of Precision Manufacturing Equipment)



International Connection Gateway



Catena-X, <https://catena-x.net/>
Manufacturing-X,
<https://www.plattform-i40.de/IP/Navigation/EN/Manufacturing-X/Manufacturing-X.html>

Mobility Data Space, <https://mobility-dataspace.eu/>
Smart Connected Supplier Network, <http://smart-connected.nl/>

Gaia-X, <https://www.gaia-x.eu/>
IDSA, <https://internationaldataspaces.org/>
DATA-EX, <https://data-society-alliance.org/>

Challenges in Data Sharing Between Businesses

To share essential business data with partners, companies must overcome the following challenges.

Company's data cannot be shared with other companies because of risk that important data and business secrets could be exposed

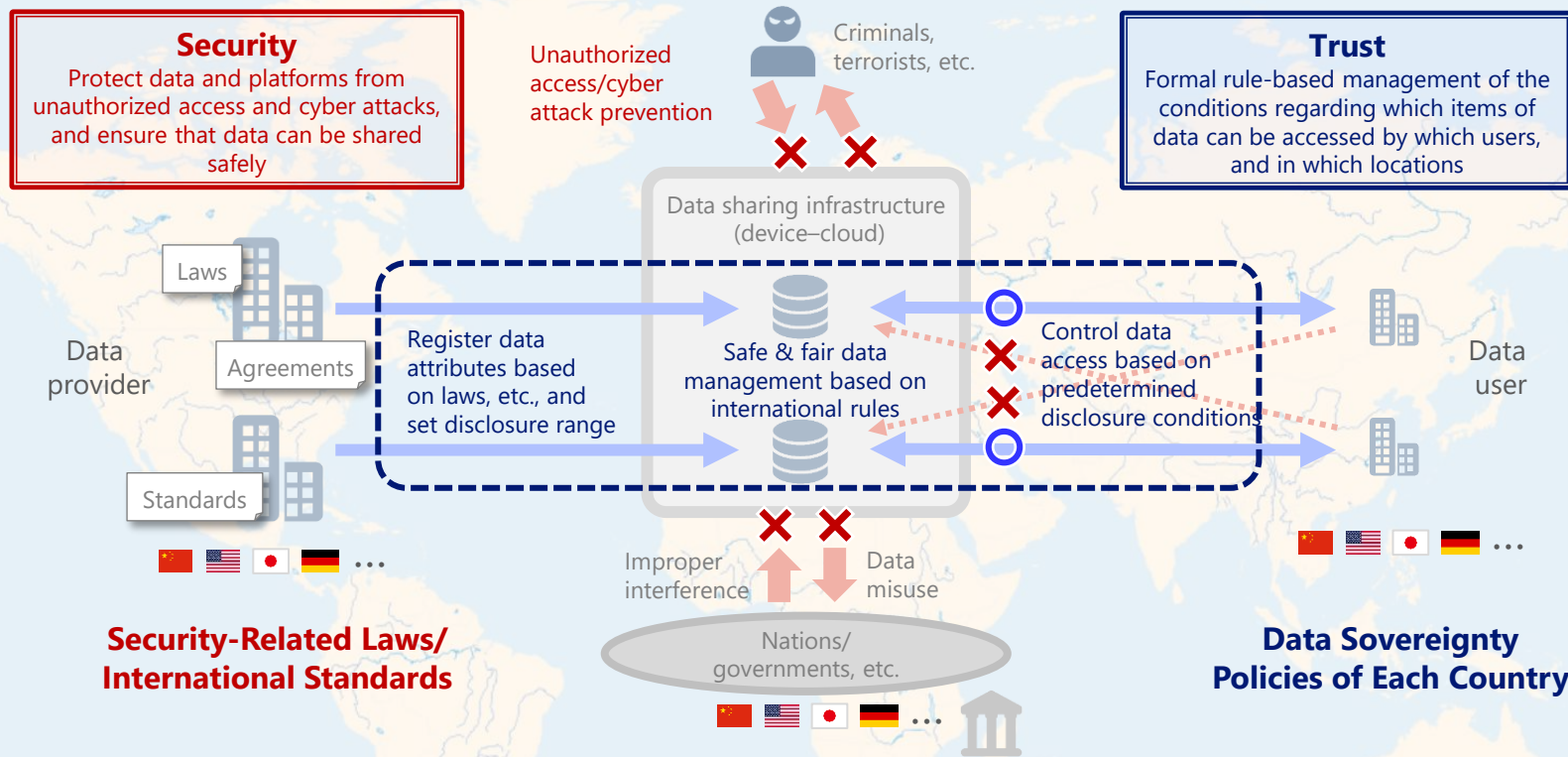
Impossible to check who will use the company's data and how they will use it when sharing data with other companies

Impossible to check if data provided by other companies is accurate and generated by legitimate means or whether it benefits one's own company

Many platforms, but ID systems and data are siloed for each industry, purpose, and company

Mechanisms to Ensure Security and Trust

For data sharing between businesses, it is essential to have security features that protect against cyberattacks, as well as mechanisms that protect the data sovereignty of providers in compliance with laws and regulations.



A Global Data Infrastructure for Data Sharing Between Businesses

NTT has published white papers on "Global Data Infrastructure for Data Sharing Between Businesses".

"Global infrastructure for data sharing between businesses"
(January 31, 2020)

GLOBAL INFRASTRUCTURE FOR DATA SHARING BETWEEN BUSINESSES

PROBLEM STATEMENT / VERSION 1.0.0 / JANUARY 31, 2020

To promote value creation using data, we are working on building an international and open ICT infrastructure that enables data to be provided, shared, and utilized securely, at low-cost, and quickly among companies in all types of industries around the world while maintaining the data owner's data sovereignty. We aim to collaborate and grow with companies, communities, and governments around the world who are working to overcome similar challenges.

PROBLEM STATEMENT

With the development of digitalization technology, the digital transformation of businesses in various industries is accelerating. The digitalization of an entire business's operations, including both internal and inter-company operations, will promote the growth of the world economy by creating new value and is also expected to reduce the risks of society as a whole.

However, although the digitalization of internal operations within individual companies is gradually progressing, the digitalization of inter-company operations is not progressing as desired. For companies to share the data that they need to perform their business with other companies, they must face the following challenges:

- The company's data cannot be shared with other companies because of the risk that important data and business secrets could be exposed.
- Checking who will use the company's data and how those parties will use it is impossible when a company shares data with other companies.
- Checking if data provided by other companies is accurate and generated by legitimate means or whether it benefits one's own company is impossible.

"A Global Data Infrastructure for Data Sharing Between
Businesses" (August 31, 2020)

A Global Data Infrastructure for Data Sharing Between Businesses

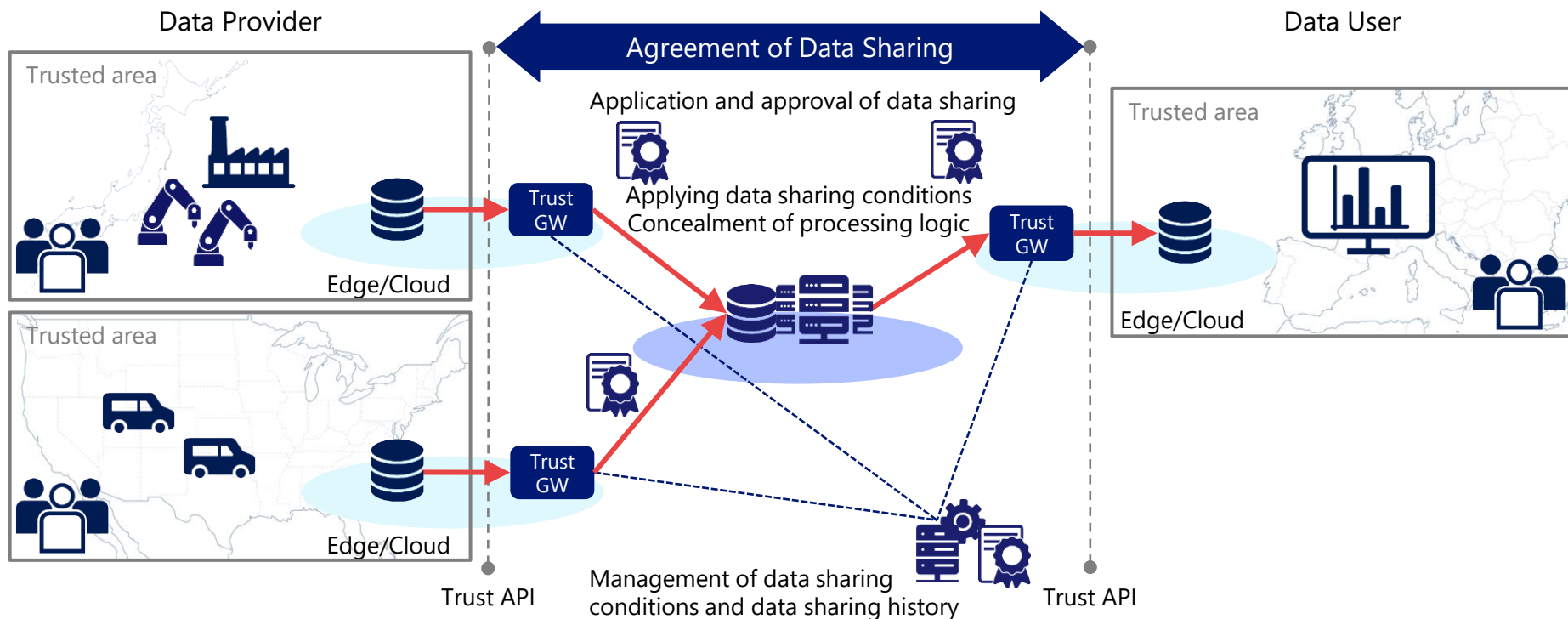
Version 1.0
August 31, 2020

<https://www.rd.ntt/e/sic/news/research/2020/326.html>

<https://www.rd.ntt/e/sic/news/research/2020/363.html>

Technology for Managing Data Sharing Conditions

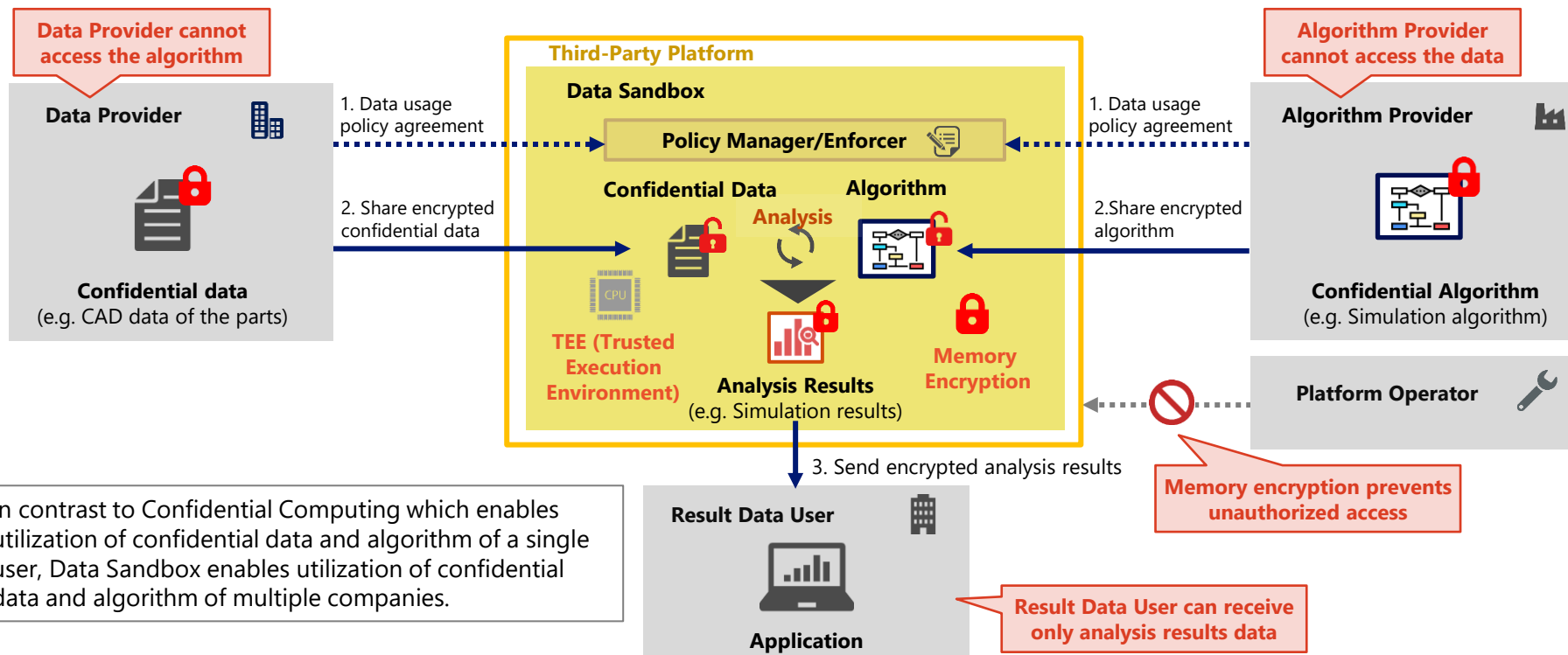
NTT has developed a technology to manage data sharing conditions.
It enables data to be shared with business users while protecting the data sovereignty of data providers.



Data Sandbox Technology for Data Usage Control

NTT is developing a technology to enforce data usage conditions.

Data Sandbox enables value creation by allowing multiple companies to use each other's confidential data and algorithms without actually sharing them, using a Trusted Execution Environment.

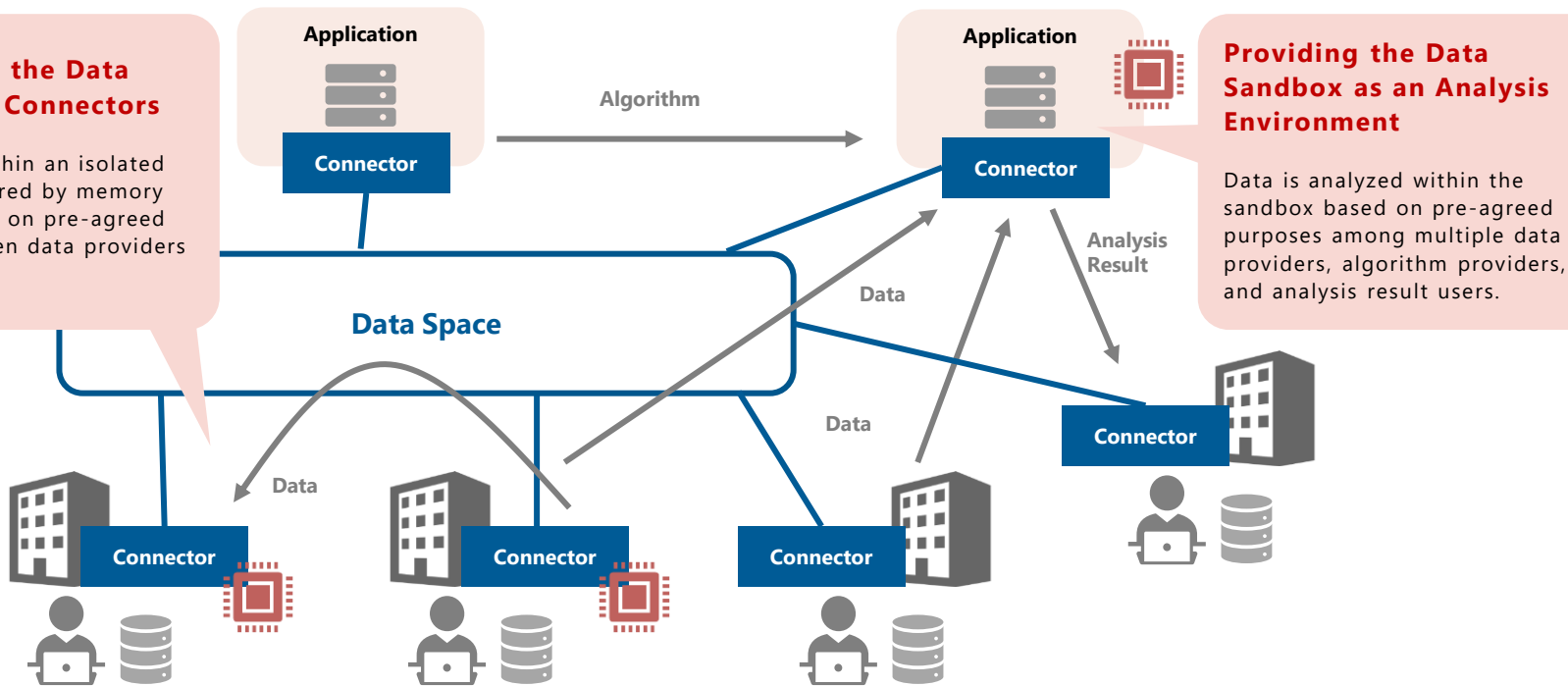


Data Sandbox Technology in Data Spaces

Data Sandbox can be integrated with connectors and serve as a platform for analysis applications within data spaces.

Integration of the Data Sandbox with Connectors

Data is shared within an isolated environment secured by memory encryption, based on pre-agreed conditions between data providers and data users.



Providing the Data Sandbox as an Analysis Environment

Data is analyzed within the sandbox based on pre-agreed purposes among multiple data providers, algorithm providers, and analysis result users.

IOWN : Innovative Optical and Wireless Network

NTT Group is developing IOWN to build next-generation communications infrastructure.

Innovative Optical and Wireless Network (IOWN)

Target Performance by FY 2030+

Low-Power Consumption

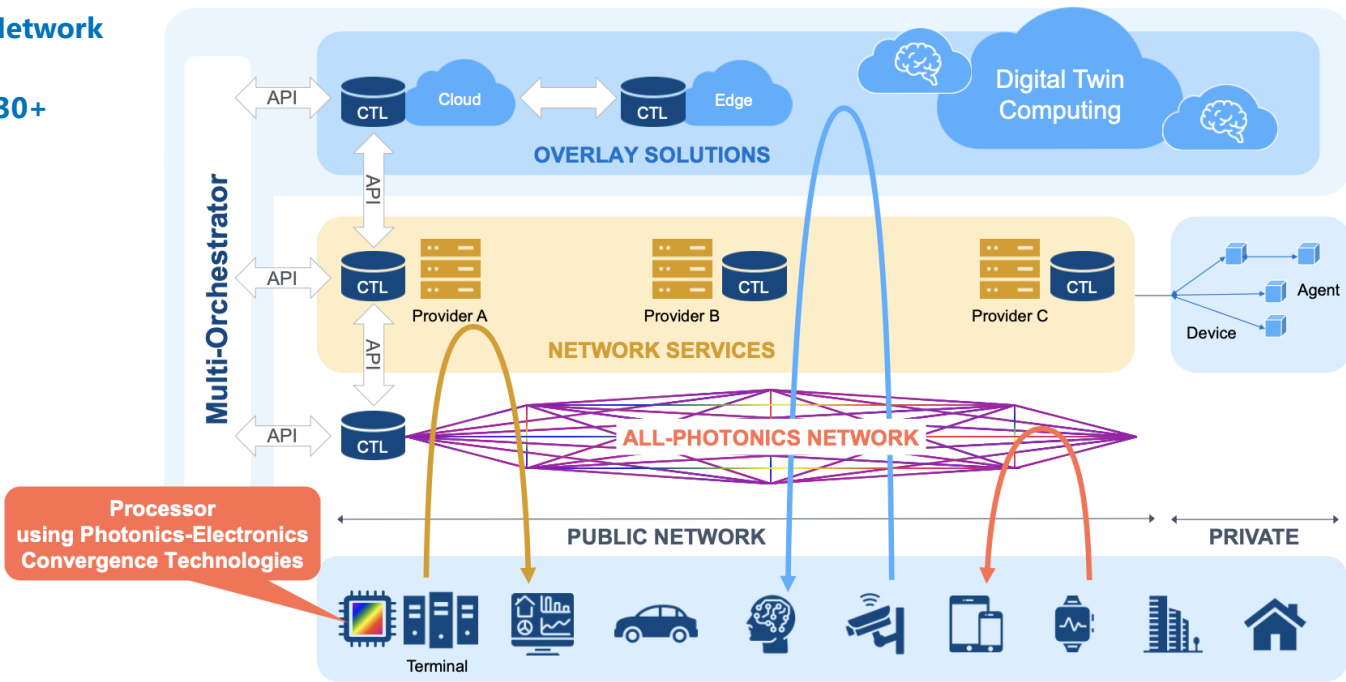
Power efficiency¹
100-times

High-Capacity/ High-Quality

Transmission capacity*²
125-times

Low Latency

End-to-end latency*³
1/200



¹ Target power efficiency of the parts to which photonics technology is applied.

² Target communication capacity per optical fiber cable

³ Target latency for video traffic within the same prefecture, requiring no compression processing.

IOWN PETs: IOWN Privacy Enhancing Technologies

IOWN includes a new approach that combines the All-Photonics Network with Privacy-Enhancing Technologies.

Innovative Optical and Wireless Network (IOWN)

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100-times

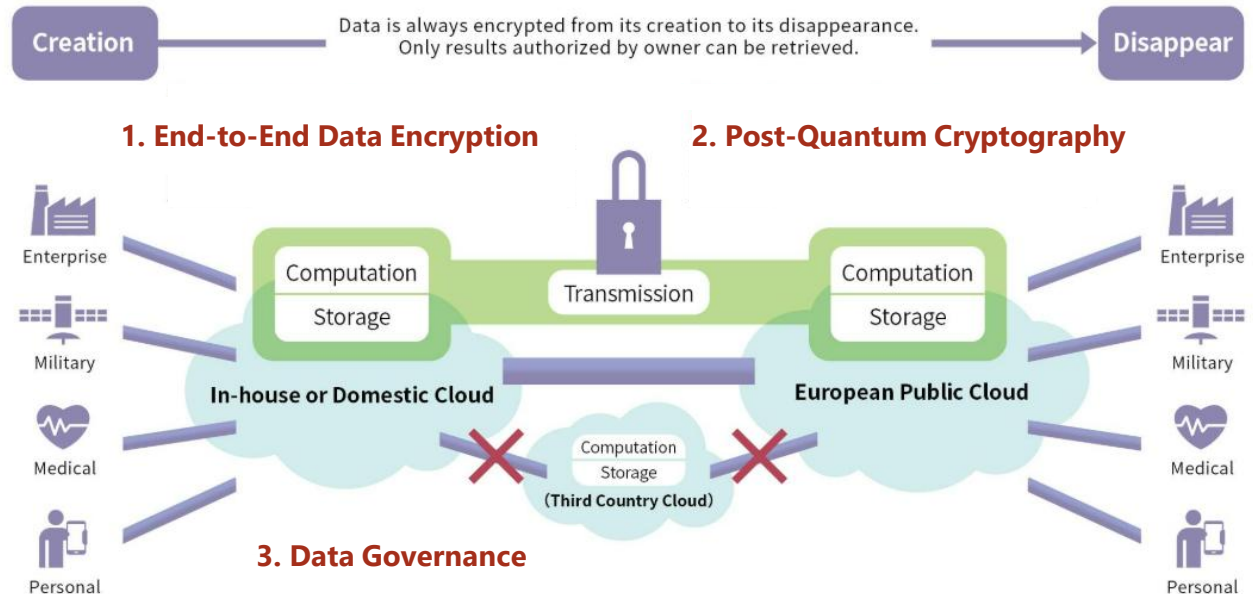
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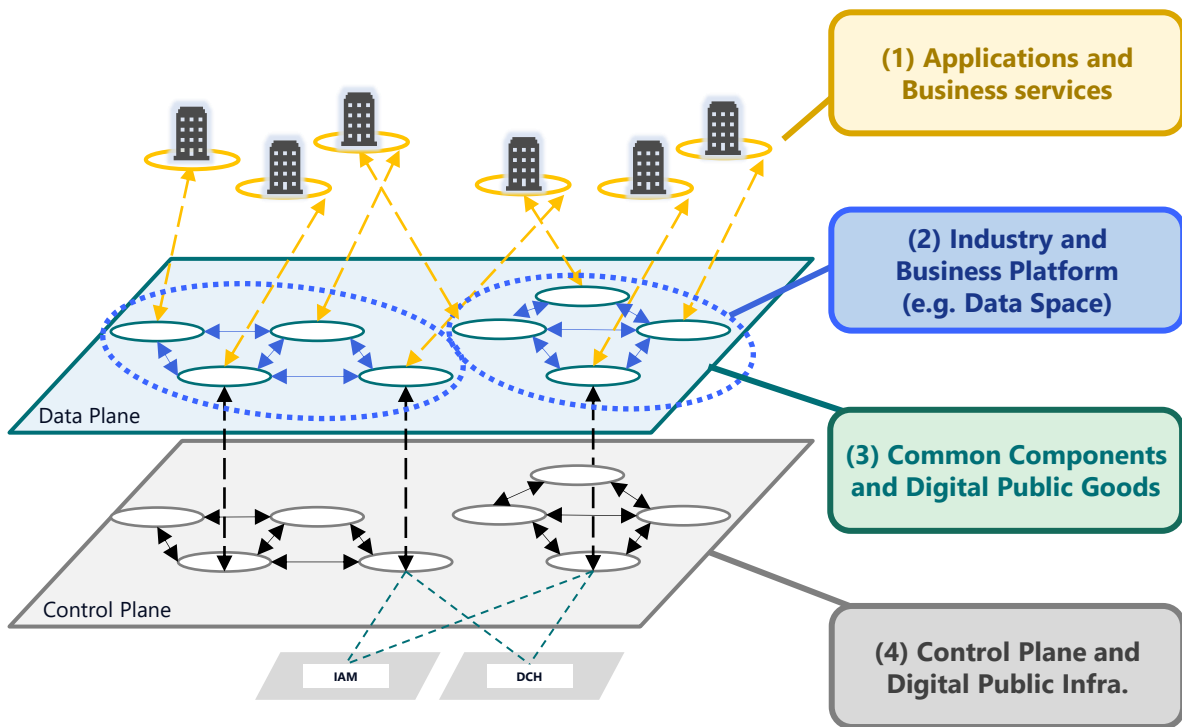
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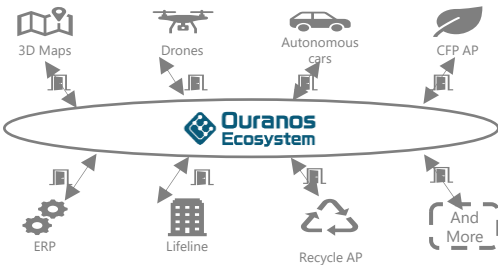


NTT Group's Initiatives for Cross-Domain Data Sharing

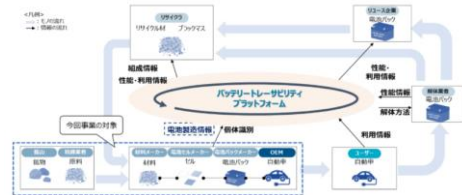
NTT Group is focusing on four key areas to ensure trusted and interoperable data sharing across companies.



JMDS (Japan Mobility Data Space)



Battery Traceability Management System



NTT Group's Global Data Space Solutions

NTT Group offers comprehensive global data space solutions in four strategic areas.

(1) Applications and Business services

Business Consulting

Enterprise Application

SaaS

(2) Industry and Business Platform

Data Space
Building Consultation

Data Enrichment
(Data processing, Analysis)

Managed Service

(3) Common Components and Digital Public Goods

Connectivity
(Connector,
Interoperability)

Digital Trust
(ID Management)

Data Governance
(Usage Control, Catalog)

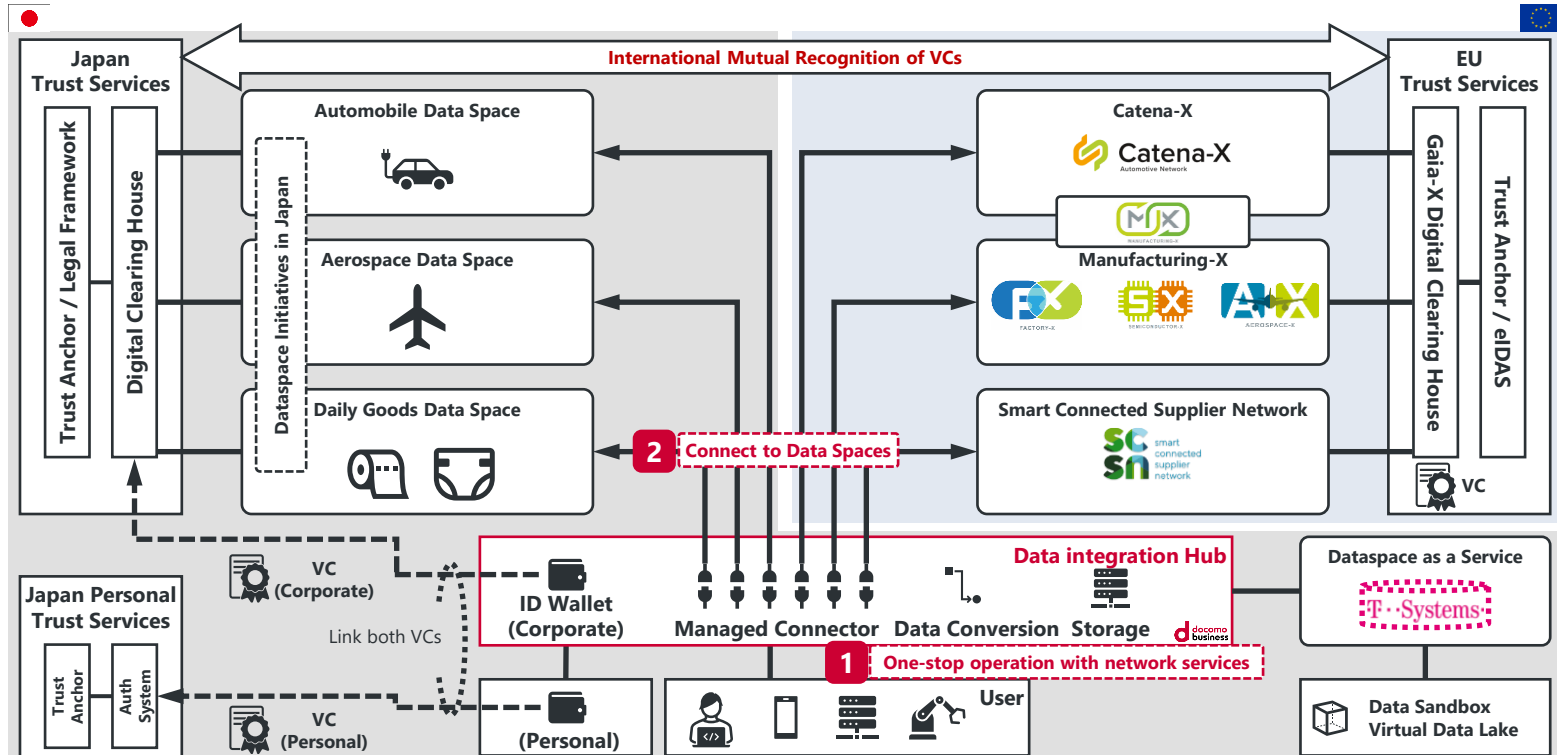
(4) Control Plane and Digital Public Infra.

Privacy Enhancing Technology

Infrastructure Service Technology

Solution Concept: Data Integration Hub

NTT Communications is developing the “Data Integration Hub”, a solution that enables secure data sharing through globally interconnected data spaces.



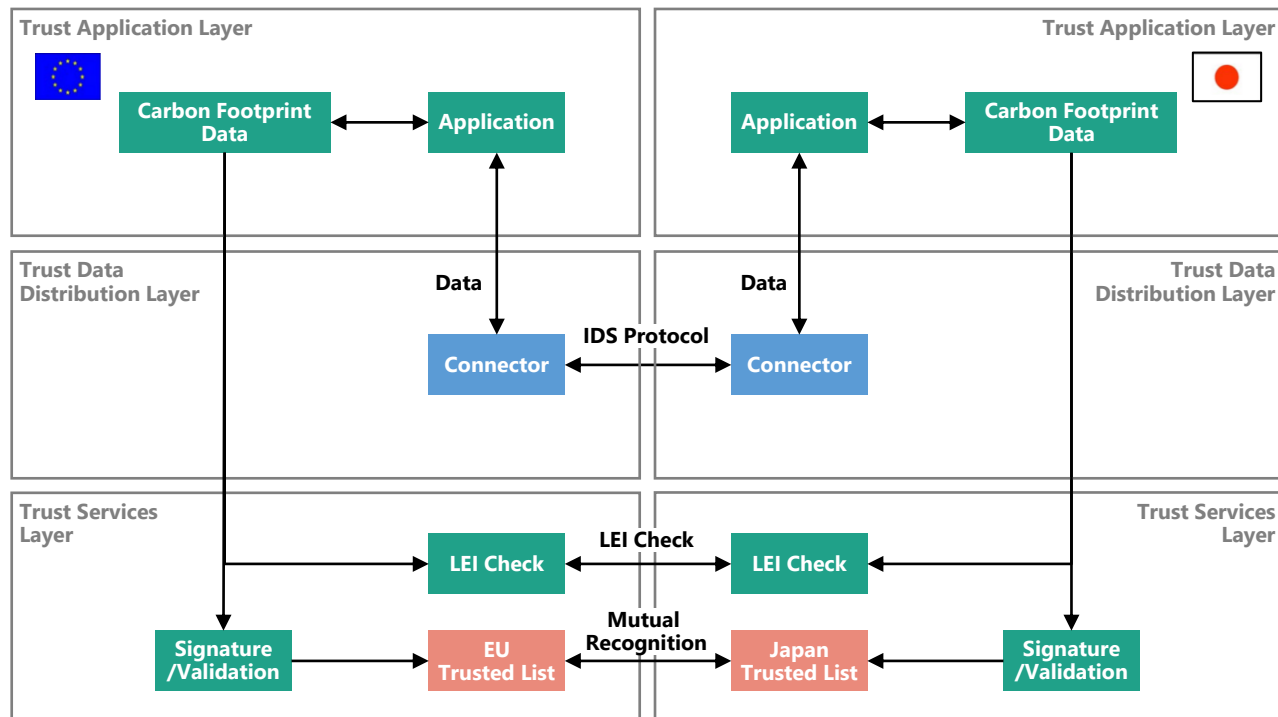
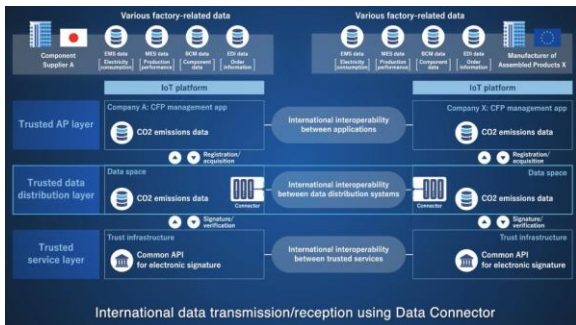
Connected Data Spaces Demo at Hannover Fair 2022

NTT Com has demonstrated connected data spaces with Fraunhofer, IDSA, Omron, Sovity, TNO and SCSN.



EU - Japan Trust Service PoC by Using Connectors

The Digital Agency of Japan and the European Commission demonstrated international mutual recognition of trust-related services and connected data spaces during the G7 Digital and Tech Ministers' Meeting in Takasaki.

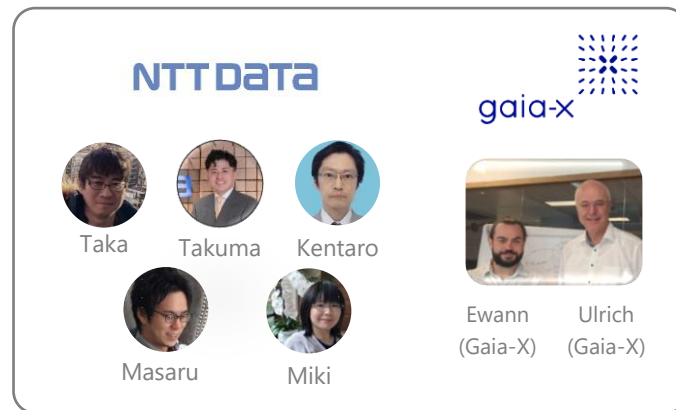


Experiments on Global Deployment of Trust Frameworks

NTT DATA is integrating connectors with trust mechanisms like the Gaia-X Digital Clearing House, which is implemented on the University of Tokyo testbed with Gaia-X.

October 8, 2024

NTT DATA and Gaia-X Expand Global Reach with Deployment of Gaia-X Digital Clearing House in Japan



Pilot Projects on Cross-Jurisdictional Data Transaction

NTT Com, Fujitsu, and T-Systems have tested a “Cross-Jurisdictional Data Transaction Scenario with Federated Identities and Trust Anchors”, supported by the University of Tokyo and NTT DATA.



Establishing global trust framework initiative for data spaces

Our vision

- ✓ Establish technical federation of trusts across countries (e.g. trust anchors and trust services)
- ✓ Foster interoperability among dataspace initiatives worldwide
- ✓ Ensure secure and efficient data collaboration
- ✓ Prepare to establish a governance body



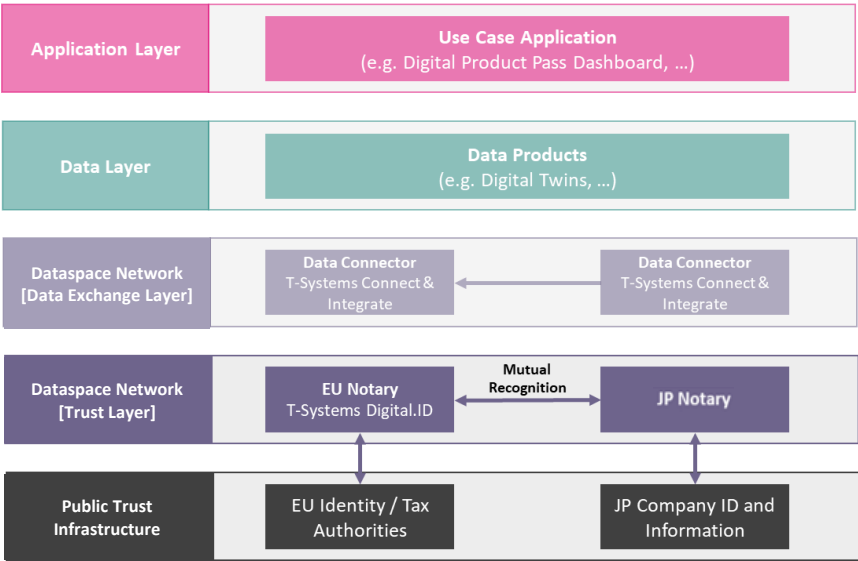
Technical pilot overview

- Phase 1** Prototype the trust anchor on a testbed in Japan for broad participation.
- Phase 2** Integrate Tractus-X sandbox to test interconnectivity with the prototype of the trust anchor and identify technical gaps
- Phase 3** Deploy cross-regional use cases with partners to assess interoperability
- Phase 4** Develop tools for technical mutual recognition and international interoperability of trust services and anchors



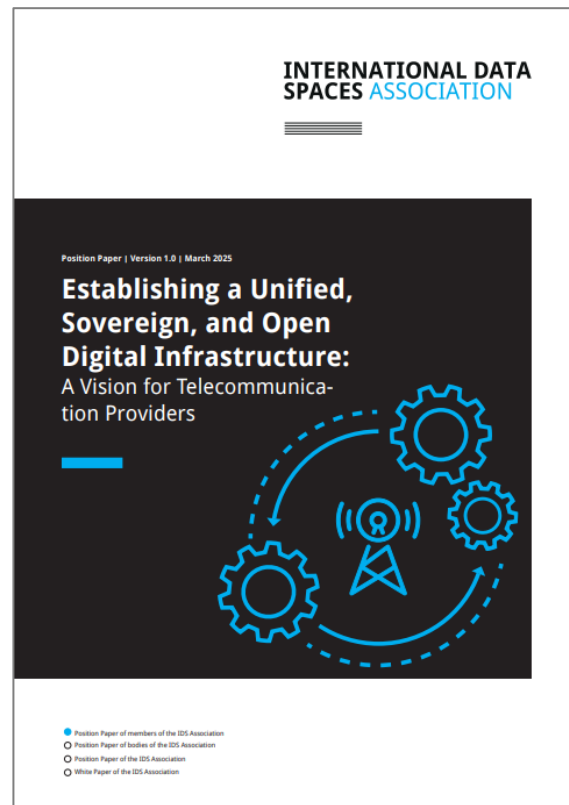
Technical infrastructure

- Use existing components and knowledge, examples are:**
- Gaia-X solutions**
Leverage Digital.ID and Gaia-X Digital Clearing House by T-Systems and NTT
- Federation expertise**
Use Fujitsu & NTT's trust service and trust anchor federation knowledge and technology
- Catena-X / Tractus-X Sandbox**
Use T-Systems' IDSA & Gaia-X compliant testbed at University of Tokyo



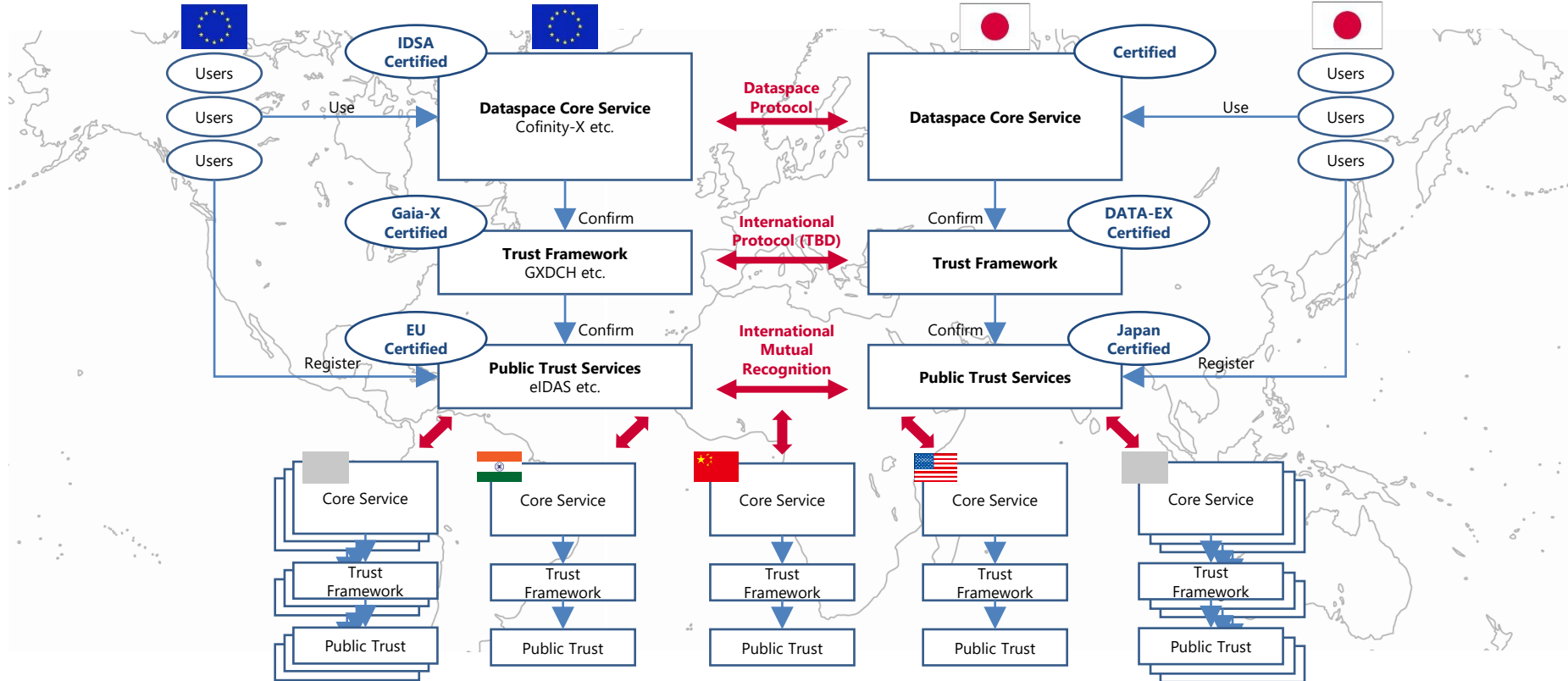
Joint Position Paper: A Vision for Telecom Providers

NTT Com and NTT DATA are collaborating with other global telecom providers to establish a unified, sovereign, and open digital infrastructure.



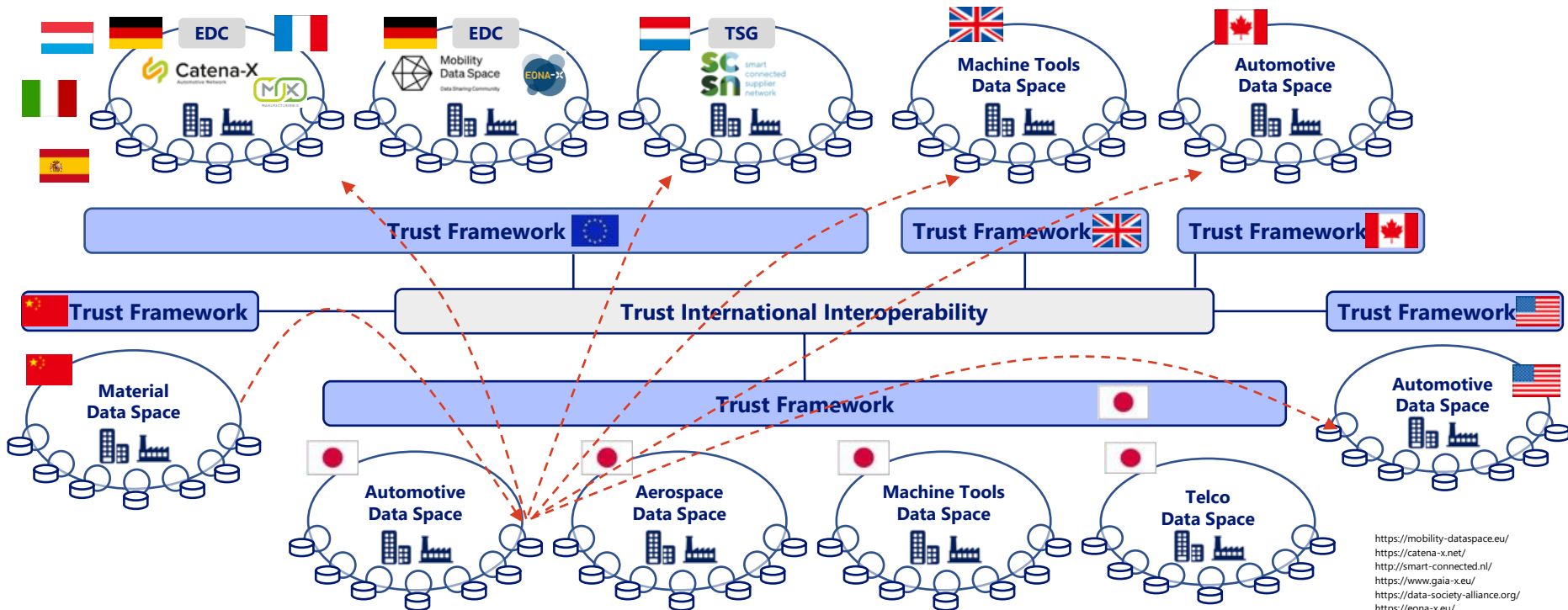
We Need an International Interoperability Framework

We need to accelerate discussions on an international interoperability framework to interconnect data spaces, trust frameworks, and public trust services.



Towards the International Interconnection of Data Spaces

Let's work together on a joint study to build an ecosystem for trusted data sharing across global value chains.



<https://mobility-dataspace.eu/>
<https://catena-x.net/>
<http://smart-connected.nl/>
<https://www.gaia-x.eu/>
<https://data-society-alliance.org/>
<https://eona-x.eu/>
<https://www.plattform-i40.de/IP/Navigation/EN/Manufacturing-X/Manufacturing-X.html>

Your Value Partner