



EU-JAPAN DIGITAL WEEK 2025



31 MARCH – 7 APRIL, 2025



TOKYO, JAPAN

THE EU-JAPAN DIGITAL WEEK IS ORGANISED AS PART OF THE EU-JAPAN DIGITAL PARTNERSHIP



DATA-EX Implementation of data spaces in Japan

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The University of Tokyo / Data Society Alliance

IDSA Japan Hub Coordinator (IDSA Ambassador)

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Noboru Koshizuka

越塚 登

Professor, The University of Tokyo
Chair, Data Society Alliance
IDSA Japan Hub Coordinator (IDSA Ambassador)

Director-General, Smart City Social Implementation Consortium
Chair, Green x Digital Consortium, JEITA
Chair, Weather x Business Consortium
Member, National Strategy Special Zone Advisory Council, Cabinet Office
Member, Digital Society Initiative Committee, Digital Agency
Member, Communications and Information Technology Council, MIC
etc.

PART 1

Society 5.0 and Dataspaces

“Era of Data”

EU JAPAN DIGITAL WEEK 2025

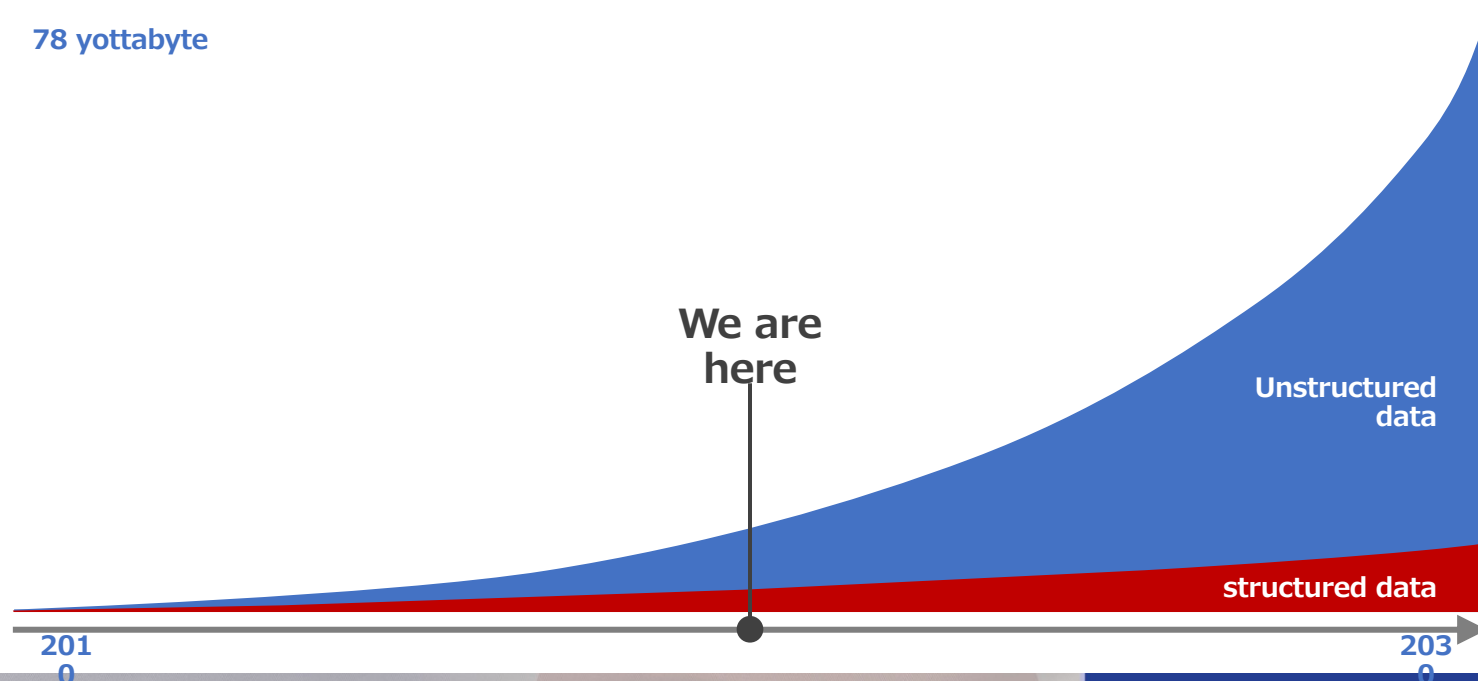
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Data Growth over the years

78 yottabyte



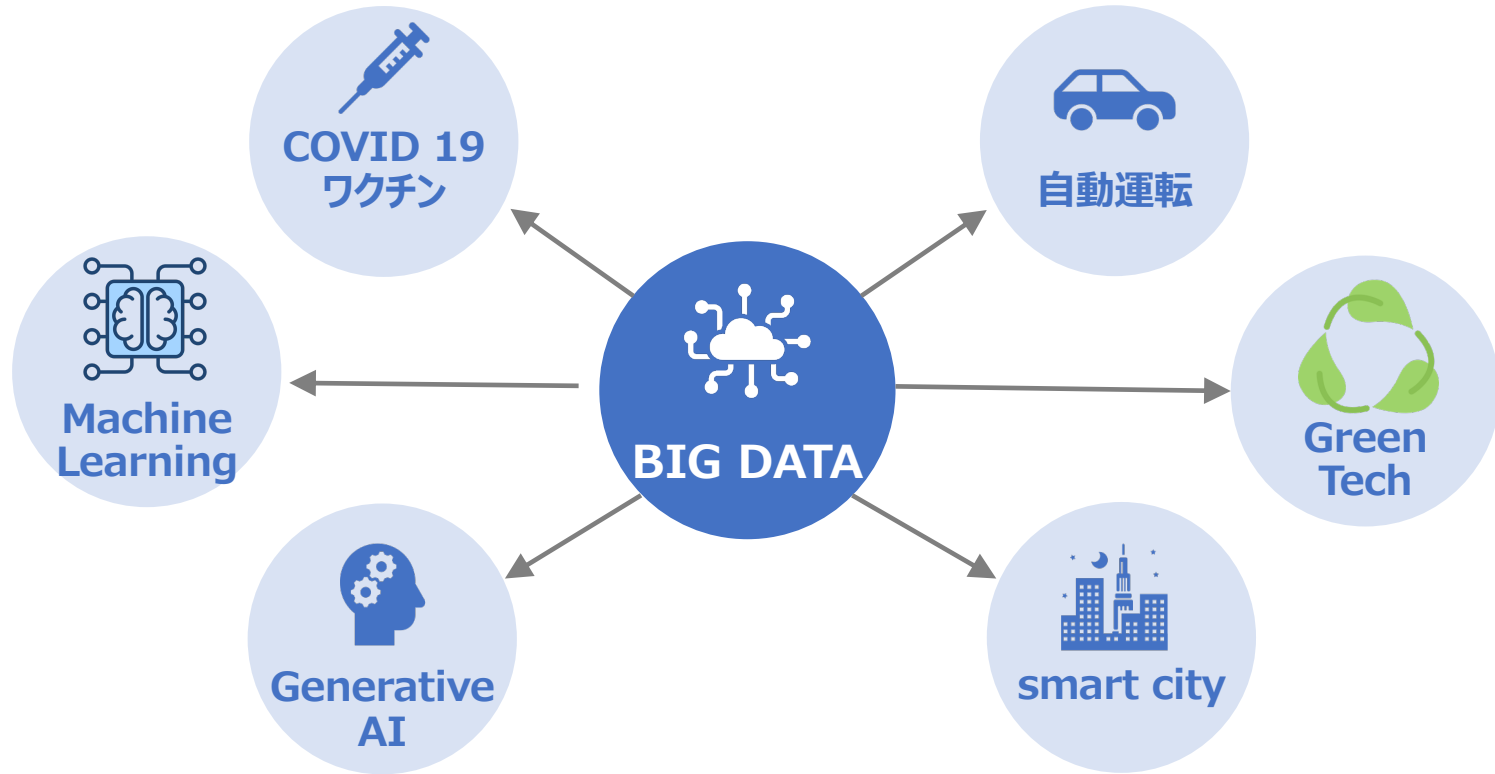
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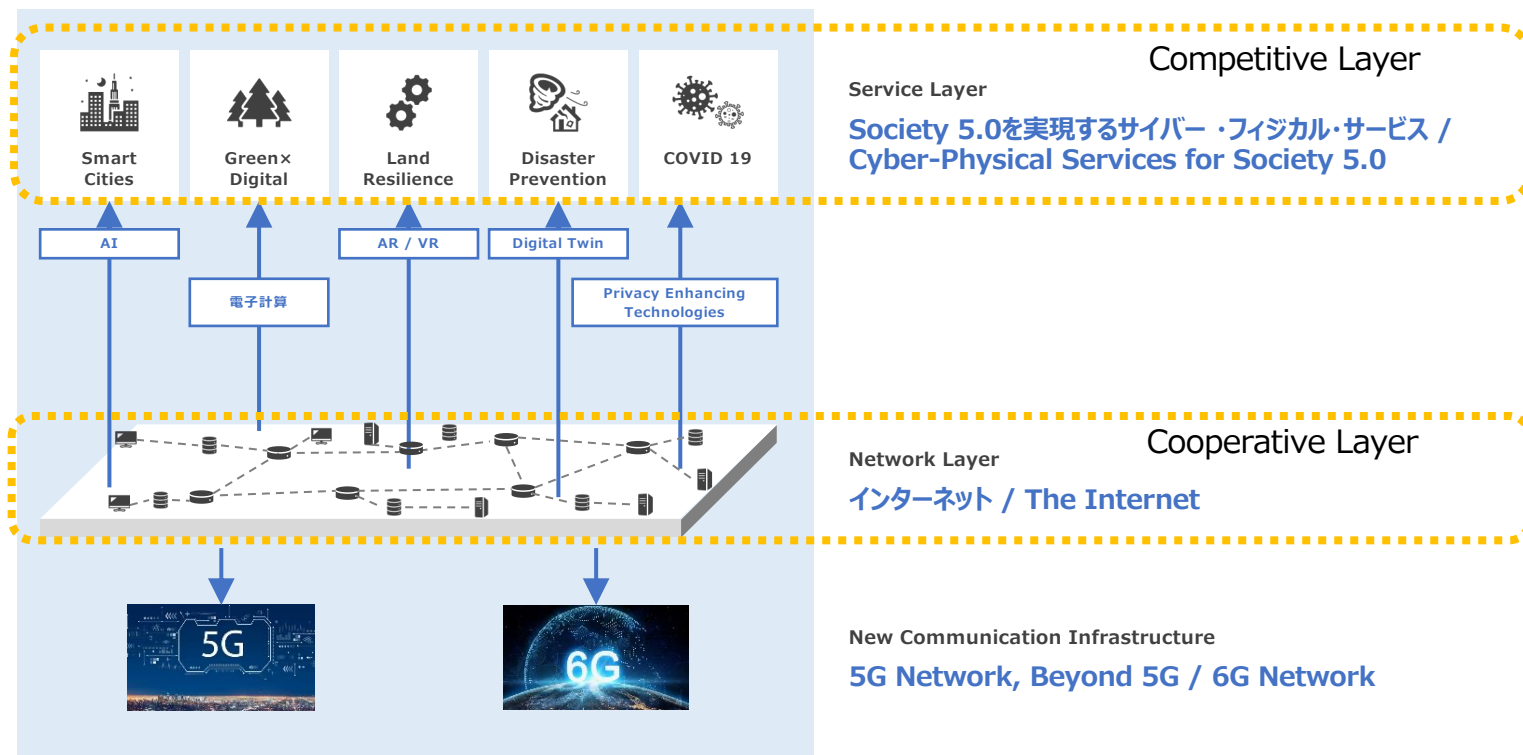
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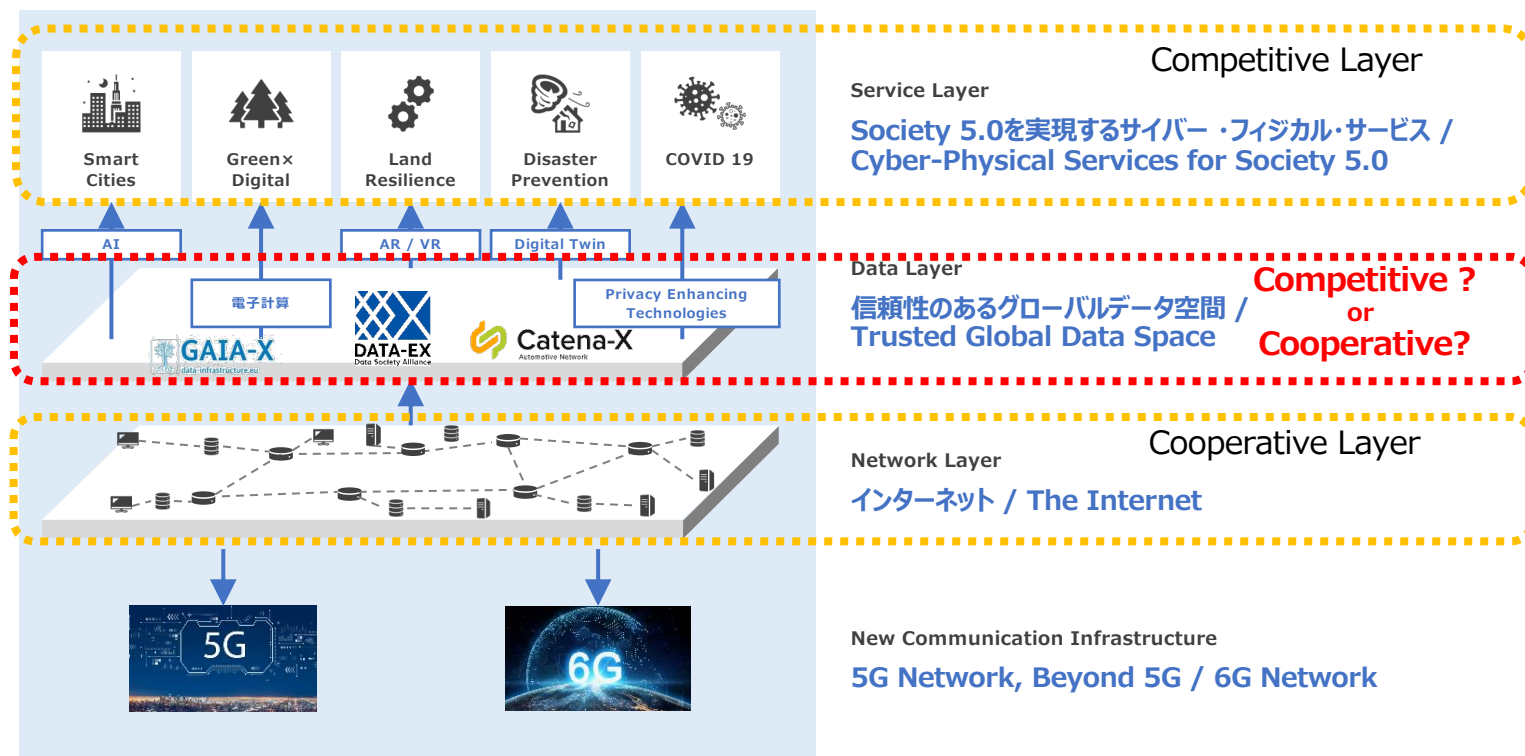
Recent innovations are “**data**-driven”



“The Internet”: Cloud-Edge Infrastructure of Today



“Data Space”: Next Generation Cyber-Infrastructure in the era of Society 5.0



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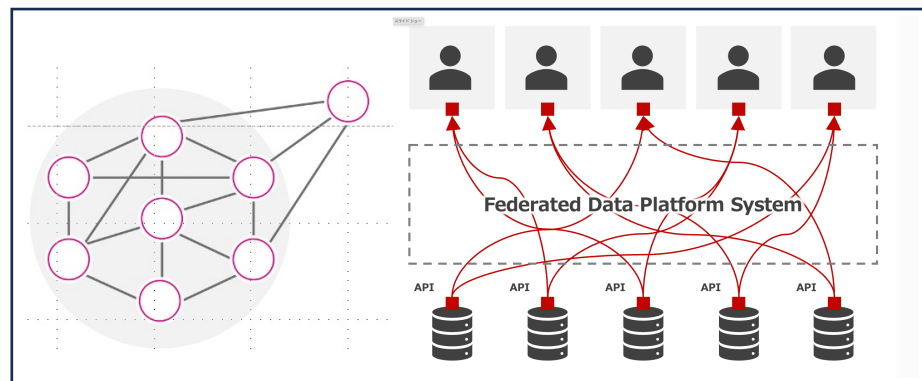
What is“Data Spaces” ?

■ A mechanism to realize the vision of...

- ▶ data sharing/distribution
- ▶ data-driven economy
- ▶ governance rules.

■ A mechanism of...

- ▶ digital technology
- ▶ organizations



■ Important concepts

- ▶ Data sovereignty
 - ◆ Data holders can control their data by themselves.
- ▶ Trust/Reliability
 - ◆ Authenticity of data providers and data users is guaranteed.
- ▶ Governance rules
 - ◆ Control the flow/usage of data in compliance with local laws
- ▶ Federated architecture
 - ◆ not centralized
 - ◆ data are not collected into one place
- ▶ Equality
 - ◆ Everyone can join with simple technologies.
- ▶ Openness
 - ◆ Everyone can join from anywhere in the world.
- ▶ Interoperability
 - ◆ Disclose data silos

PART 2

DSA/DATA-EX



2-1 Data Society Alliance (DSA)

DATA-EX/DSA (Data Society Alliance)

<https://data-society-alliance.org/>

一般社団法人データ社会推進協議会
DATA-EX
 Amount of Data Created Daily (2024)
 explodingtopics.com/.../data-generated-per-d...

Language JP 会員ログイン 入会案内

「DATA-EX」とは トピックス DSAについて 委員会活動 活動ライブラリー お問合せ 検索

HOME > 「DATA-EX」とは

「DATA-EX」とは

DATA-EXとは、データ連携に係る既存の取組が協調した「連邦型の分野を超えたデータ連携」を目指すプラットフォームです。

この取り組みでは、[SIP分野間データ連携基盤事業](#)で開発したデータカタログ検索機能など分野間データ連携基盤技術（コネクタ）に加え、原本性保証・品質評価などの共通機能、データ管理機能、統計・解析、可視化などのデータ利用機能などの機能開発を行います。

DATA-EXは、国内のデータ連携のハブとなるとともに、GAIA-X等の国際的なデータ連携基盤との相互運用を見据え、海外の主要団体とも議論を重ね、社会実装を進めるものです。



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DATA-EX

- ▶ DATA-EX is the collective name for the efforts of the Data Society Alliance (DSA) to realize cross-domain data exchange.
- ▶ The DATA-EX cross-domain data exchange platform (hereinafter referred to as "DATA-EX"), which is at the core of these efforts, is a technical and social platform that enables the discovery and use of data across fields.

Vision

- ▶ “World of Data-Driven Innovation”

Mission

- ▶ Establish Data Driven Society with democracy of innovation
- ▶ Develop data-distribution infrastructure for the world
- ▶ Accelerate social implementation with Technology and Service development
- ▶ Collaboration and Contribution to the World

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Organization of Data Society Alliance (DSA)

A Members



B Members



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International Collaboration of DSA



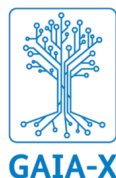
MoU with FIWARE Foundation



MoU with IDSA



MoU with GAIA-X

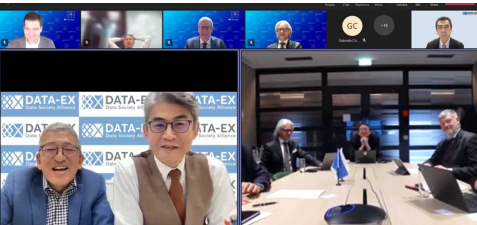


Conclusion of Collaboration Agreement with The International Data Spaces e. V. (IDSA)
We agree on international cooperation for international standards to realize a data society.

Data Society Alliance.org
Noriaki Okui

On October 10, 2021, the Data Society Association (DSA) signed a collaboration agreement with The International Data Spaces, e. V. (IDSA), a leader in promoting standards for data collaboration in Europe.

In this way, both organizations will contribute to creating and developing a data society that will ensure reliable data sharing by all stakeholders under their sovereignty to realize a growing data economy.



MoU with Manufacturing-X



MoU with Organization for Data-driven Application (ODA), Taiwan



MoU with Institution of Information Industry (III), Taiwan



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International Open Forum on Data Society

<https://iofds.org/>





International Open Forum on Data Society

The International Open Forum on Data Society is a group of people who share the same values and contribute to the creation of global standards and solutions which help to transform the digital world.

Members of IOFDS

INTERNATIONAL DATA SPACES ASSOCIATION	BDV BIG DATA VALUE ASSOCIATION	FIWARE FOUNDATION	gaia-x
DAWEX	DATA-EX Data Society Alliance	DLR	Atsumi & Sakai
東京大学 THE UNIVERSITY OF TOKYO	SIEMENS	NTT DATA	MITSUBISHI ELECTRIC Changes for the Better
IPA	EverySense Information Harvesting	Robot Revolution & Industrial IoT Initiative	FUJITSU
LNi4.0	C to E Consultancy Services	docomo business	KENAMATS

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International Open Forum on Data Society <https://iofds.org/>



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Japan-Luxembourg Collaboration (June 11~13, 2024)

NTT DATA



LNDS



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Collaboration on Data Space between Japan and Switzerland



Workshops

- ▶ Purpose: In cooperation with the Koshizuka Lab. of U Tokyo and the Swiss Federal Government (スイス連邦政府) (Directorate of International Law, Swiss Embassy to Japan and Federal Chancellery), this workshop will be held to discuss the possibility of collaboration on Data Space area between Japan and Switzerland, such as joint research and demonstrations. The workshops will introduce the data space initiatives in Japan and Switzerland and discuss possibility of collaboration between the two countries.
- ▶ Plan
 - ◆ Session 1: Data Space Initiatives in Japan (August 23)
 - ◆ Session 2: Data Space Initiatives in Switzerland (September)
 - ◆ Session 3: Proposals and discussion on areas of collaboration (September / October)

1st Session of the Workshop Series

- ▶ Date and Time Friday August 23, 18:00-20:00 JST / 11:00-13:00 CEST
- ▶ Venue Online (zoom)
- ▶ Program
 - ◆ Data Space Initiatives in Japan (Prof. Noboru Koshizuka, The University of Tokyo)
 - ◆ International Testbed of Dataspaces Technology (Prof. Hirotsugu Seike, The University of Tokyo)



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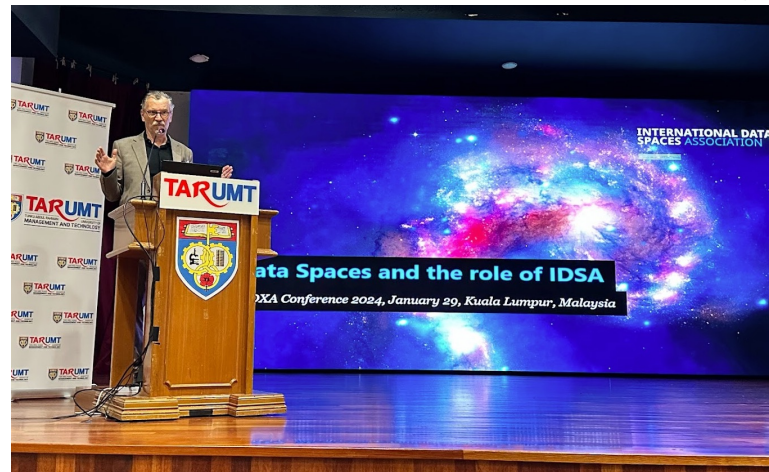
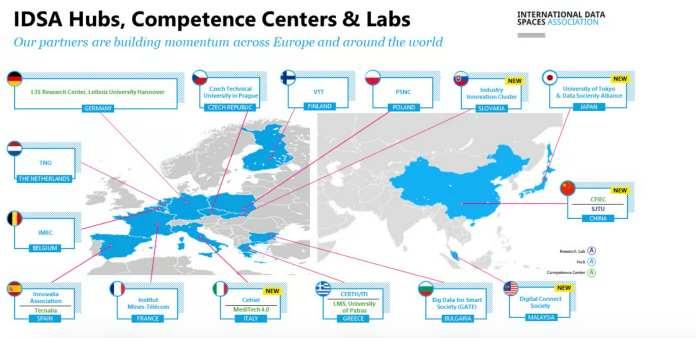
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Collaboration with IDSA Malaysia Hub (Jan. 29, 2024)



Unlocking the Future: International Data Spaces Association (IDSA) Hub Malaysia Inauguration



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Data Spaces Week 2024 (Oct. 7~11, 2024, UTokyo, Japan)



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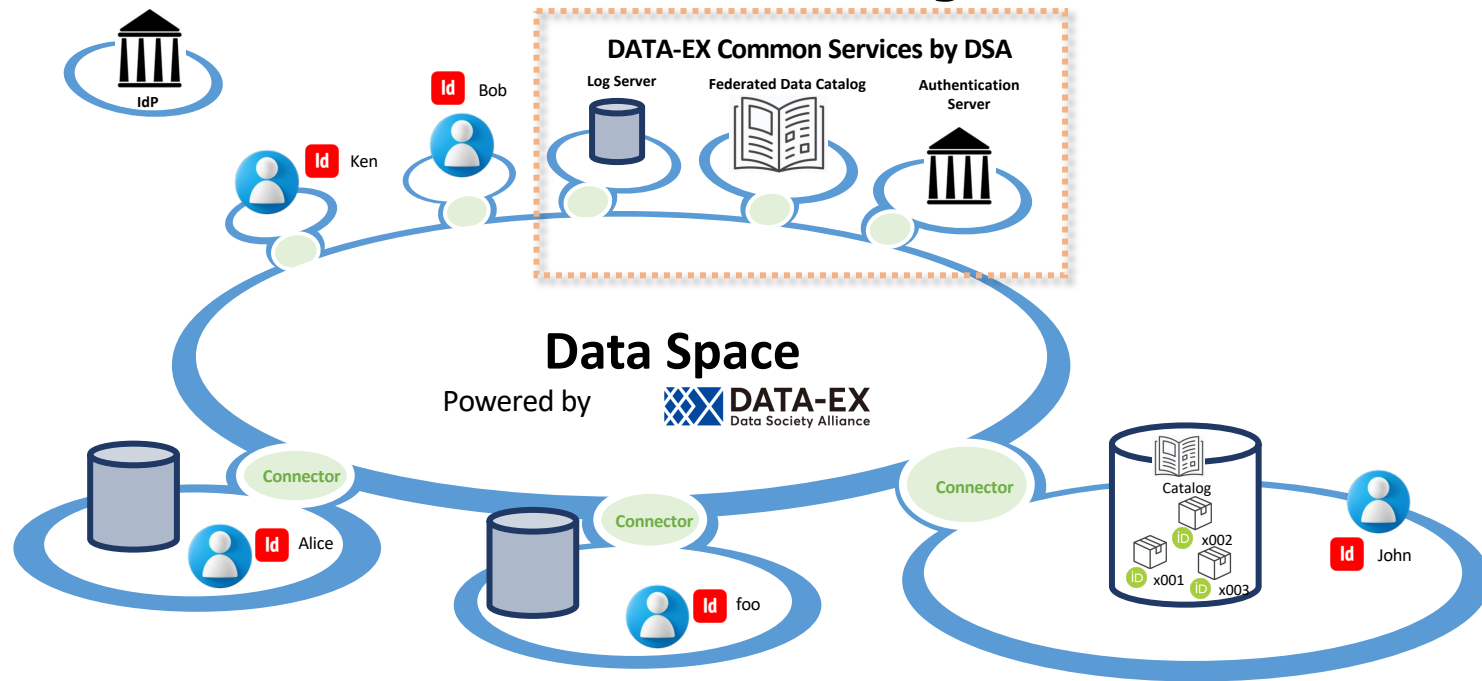
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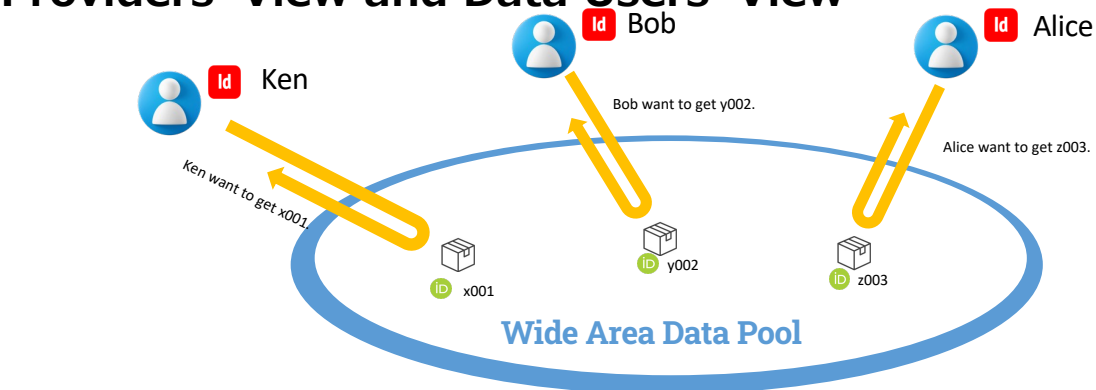


2-2 Technology

After DATA-EX: “All silos are federated using connectors”



High Level Architecture Model of DATA-EX: Data Providers' View and Data Users' View

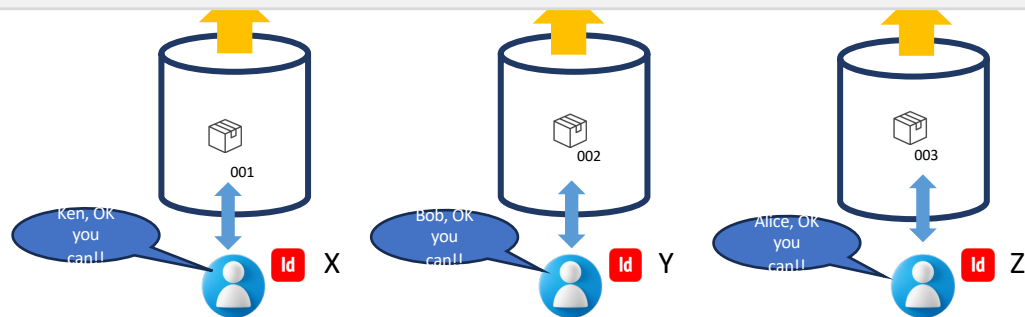


Data Users' View

Regardless of the data controller or the location (address) of the site, Data can be acquired simply by specifying the unique ID assigned to the data.



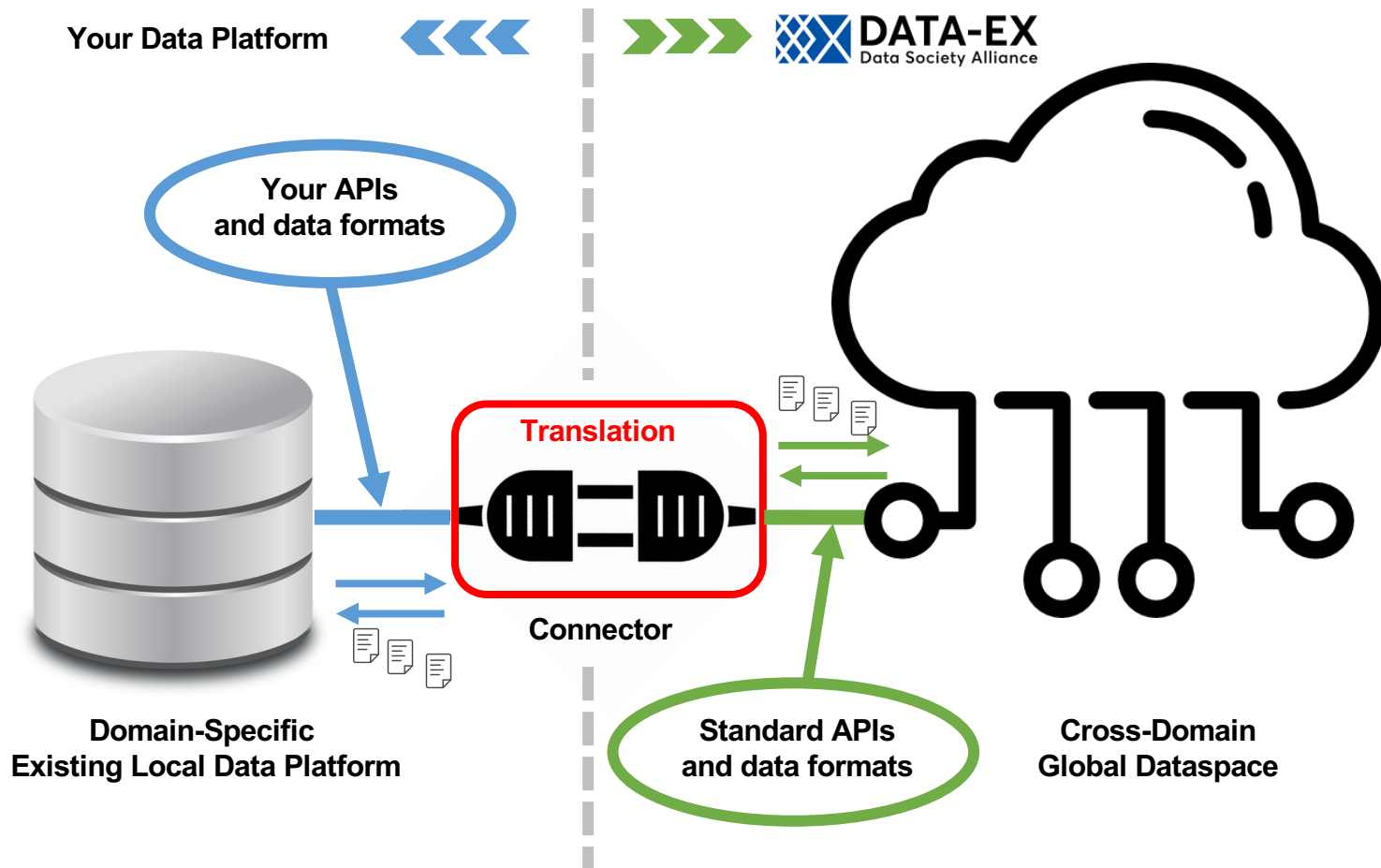
Virtualization with the DATA-EX Platform(Federation Architecture)



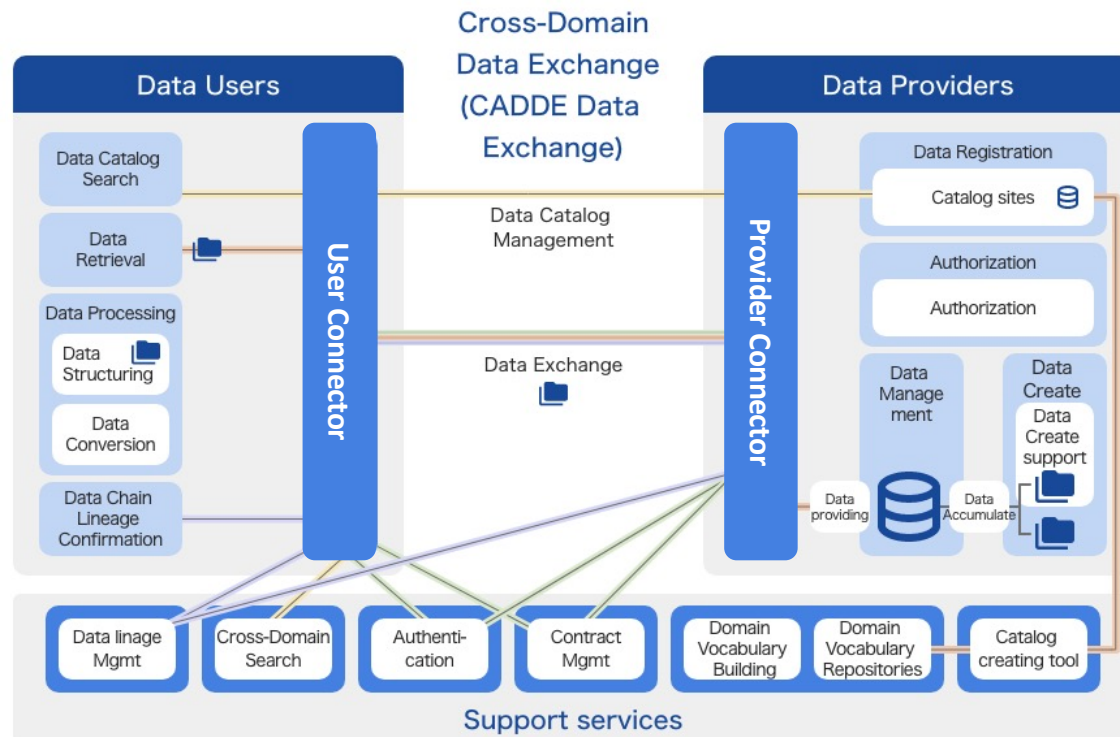
Data Providers' View

As usual on your own site/
Own your data/
Manage individually

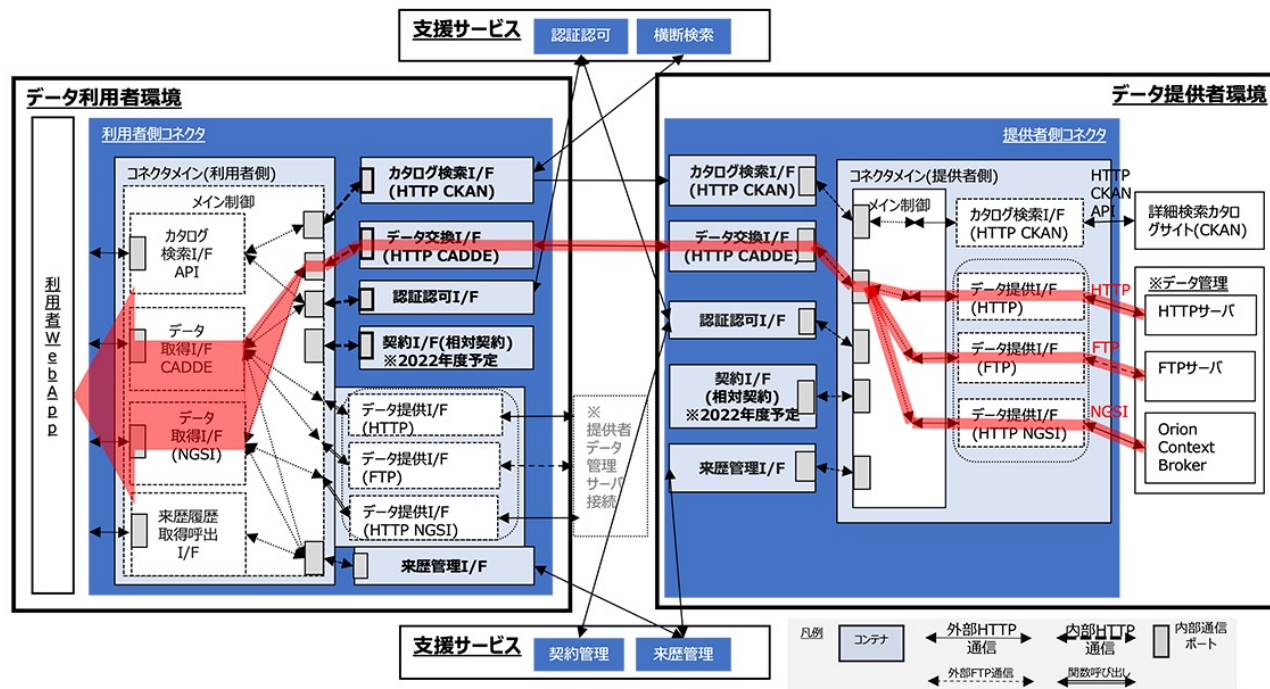
“Connector”-based Federation Architecture



Cross Domain Data Exchange (CADDE Data Exchange)

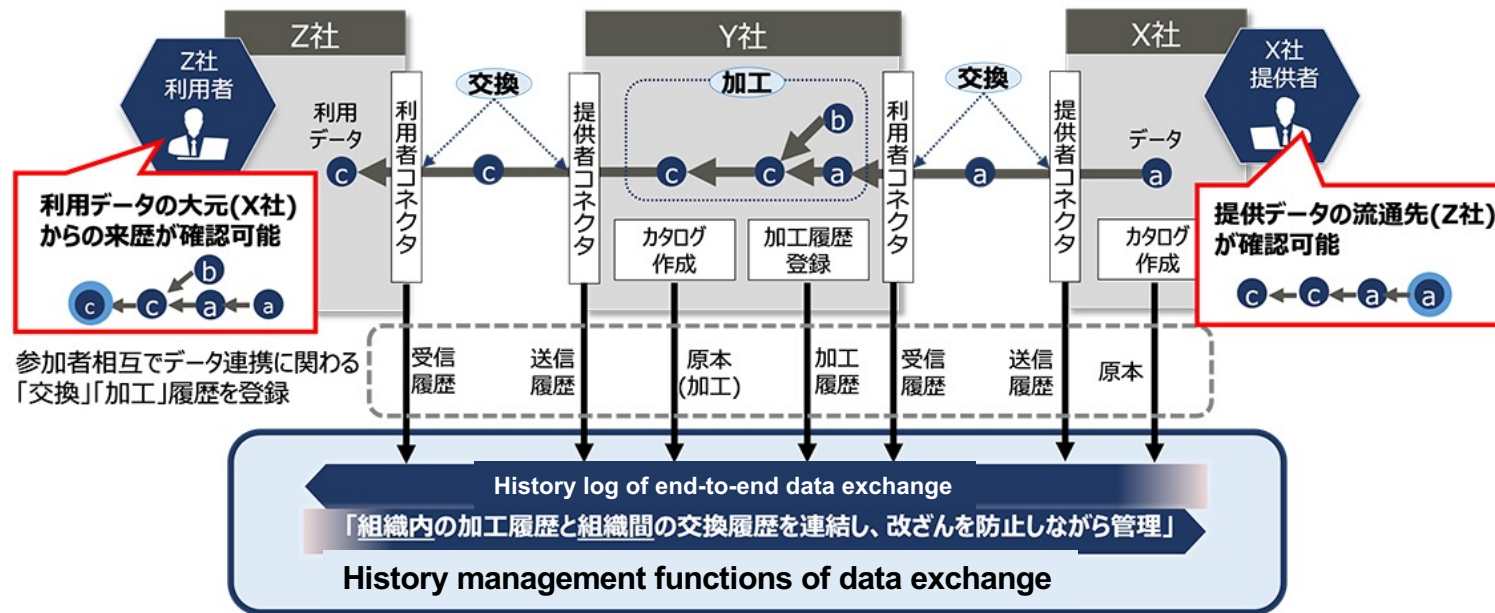


System Overview of CADDE Connector Modules



Data Exchange History Management in CADDE

History management of end-to-end data exchange among multiple organizations



Federated Data Catalog (Metadata Federation Mechanism)

...More than 150,000 open datasets are collected

Searching datasets
by "COVID 19"

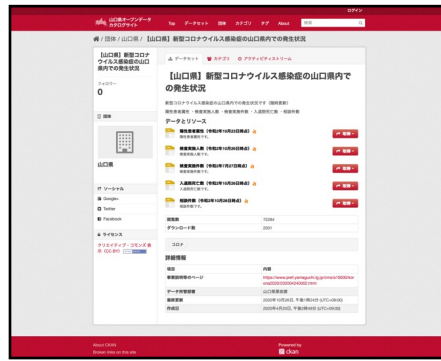
Many metadata are obtained by
searching open data catalogues
managed by city governments in Japan
in a federated manner.



Kobe City

Yamaguchi City

Tokyo Metropolitan Gov.



External Specifications of SIP CADDE 4.0

<https://github.com/CADDE-sip/documents/tree/master/doc/4>

The screenshot shows the GitHub repository page for `CADDE-sip/documents`. The repository is public and has 1 fork and 0 stars. The file structure is as follows:

- `contacts`
- `doc`
 - `1`
 - `2`
 - `3`
 - `4` (selected)
 - `50_V4_外部仕様`
 - `readme.md`
 - `5`
 - `6`
 - `7`
 - `8`
 - `CADDE_v4_document_list_20...`
 - `readme.md`
 - `LICENSE`
 - `README.md`

The selected file is `documents/doc/4`. The commit history shows the following:

Name	Last commit message	Last commit date
..		
50_V4_外部仕様	Hotfix 20230331 (#1)	10 months ago
readme.md	Update readme.md	10 months ago

The content of the `readme.md` file is as follows:

4. External Specification(APIs)

CADDEの機能とサービスの外部仕様であるAPI仕様（機能やサービスのネットワークを経由して利用するインタフェース定義）を定義した資料です。

著作者及びライセンスについて

本ディレクトリ(documents/doc/4/)に格納されている資料の著作者は、SIP分野間データ連携基盤技術社会実装コンソーシアム（日本電気株式会社、エリセンズジャパン株式会社、株式会社日立製作所、大学共同利用機関法人 情報・システム研究機構 国立情報学研究所、株式会社ザイナス）です。

[クリエイティブ・コモンズ 表示 4.0 国際 ライセンス](#) (CC BY 4.0) で提供します。

SIP CADDE: OSS for Dataspaces in Federated Architecture

<https://github.com/CADDE-sip>

The screenshot shows the GitHub repository page for CADDE-sip. The repository is categorized under 'Open Source' and has a search bar at the top. The repository name 'CADDE' is displayed with a logo consisting of purple squares. Below the repository name, there are tabs for 'Overview', 'Repositories' (5), 'Projects', 'Packages', and 'People' (1). The 'Overview' tab is selected. Under 'Popular repositories', there are five repositories listed: 'connector' (Python, 7 stars, 4 forks), 'cdl-front-server' (Java, 2 stars, 1 fork), 'cdl-chaincode-go' (Go, 1 star, 1 fork), 'documents' (SIP dataspace data connection base document, 1 fork), and 'catalog_tool' (HTML, 1 fork). On the right side, there is a 'People' section showing 12 contributors and a 'Top languages' section showing Python, Java, Go, and HTML.

Product Solutions Open Source Pricing

Search or jump to...

Sign in Sign up

CADDE

Overview Repositories 5 Projects Packages People 1

Popular repositories

- connector** (Public)
2023年3月版分野間連携基盤コネクタ (CADDE)
Python 7 stars 4 forks
- cdl-front-server** (Public)
2023年3月版来歴管理機能
Java 2 stars 1 fork
- cdl-chaincode-go** (Public)
2023年3月版来歴管理機能(ブロックチェーンプログラム)
Go 1 star 1 fork
- documents** (Public)
SIP分野間データ連携基盤のドキュメント
1 fork
- catalog_tool** (Public)
2023年3月版カタログ作成ツール
HTML 1 fork

People

12

Top languages

Python Java Go HTML

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PART 3

Discussion



Discussion 1 Interoperability

Five Technology Facets for Data Interoperability

Lesson from DATA-EX, “Interoperability is not so simple”

1

Social Interoperability

Interoperability of License, governance rules, business customs, ...

2

Tool Interoperability

Interoperability of tools dealing with data
such as programming languages, data utility libraries, ...

3

Semantic Interoperability (Meanings of Data)

Interoperability of semantics (meaning) of data
such as vocabularies, parameterization, units, ...

4

Format Interoperability (Syntax and Lexicon)

Interoperability of syntax (data formats) of data
such as file formats, parameter data format, character codes, ...

5

Access Interoperability

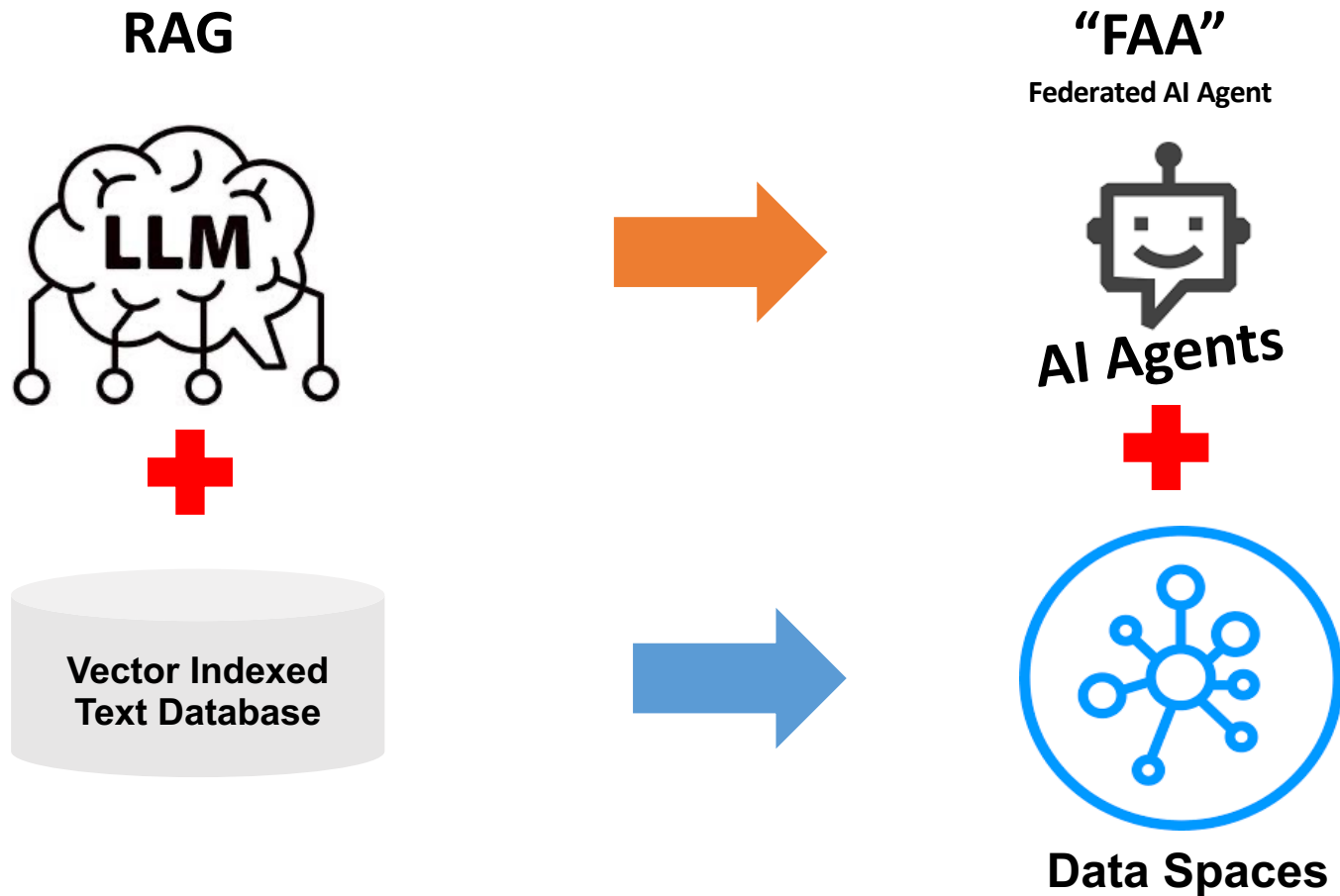
Interoperability of data exchange interfaces
such as communication protocols, APIs, data query languages, ...



Discussion 2

AI plus Dataspace

“Federated AI Agent” [Koshizuka-lab, 2025]



Benefits of “Dataspaces plus AI”

■ Dataspace is useful for AI (LLM)

- ▶ In Learning Phase
 - ◆ Learning from data sets from multiple collaborative organizations
- ▶ In Inferencing Phase
 - ◆ Inferencing with Databases (eg. **F-RAG**)
 - ◆ Dynamic Learning with Databases (eg. **F-RAG**)
 - ◆ Dealing with **Real-time** Information

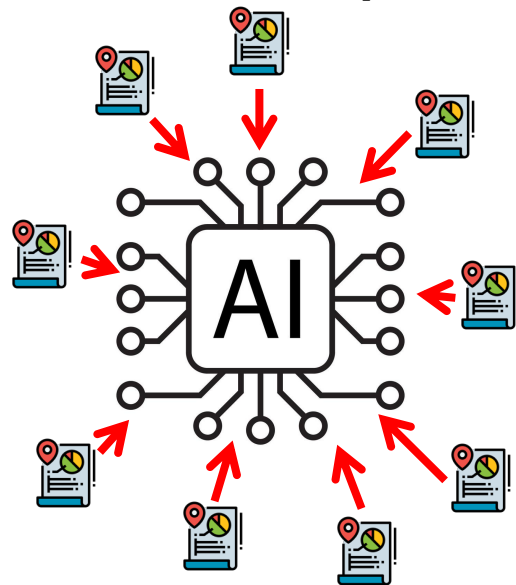
...

■ AI (LLM) is useful for Dataspace

- ▶ Enhancing findability of data
 - ◆ eg. **Data catalog** with LLM provide us natural language interfaces for searching data

...

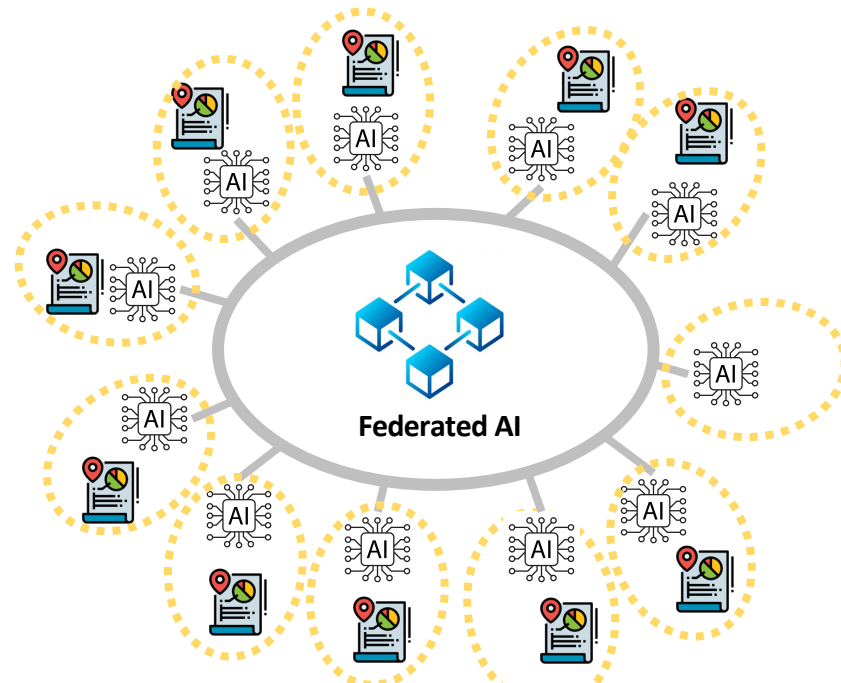
Future: From Data Spaces into “AI Spaces” [Koshizuka-lab, 2024]



Data Monopolization
Data Hegemony

Big General AI

VS.



Data Sovereignty
AI Space

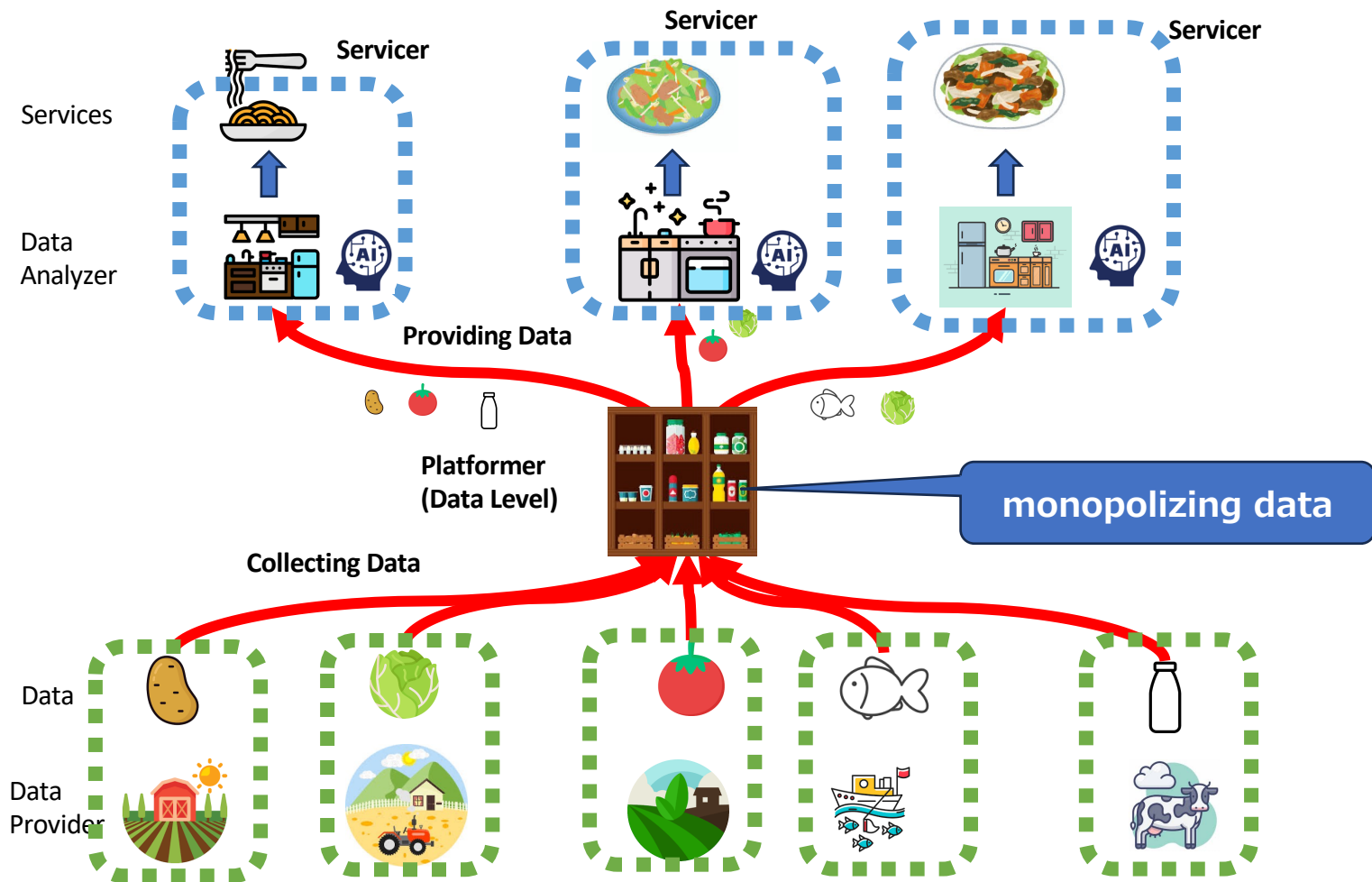


Discussion 3

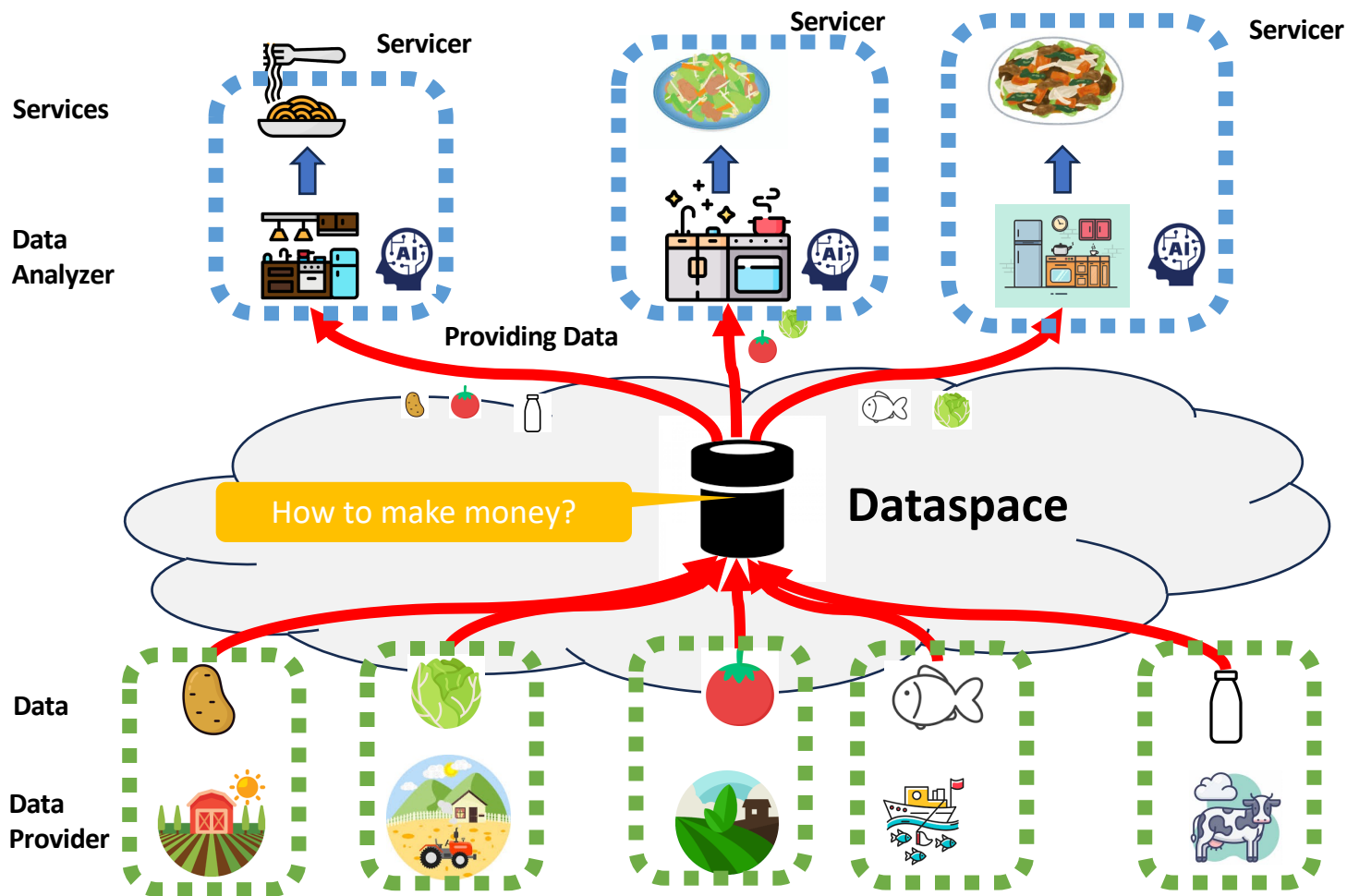
Biz Model of Dataspaces

How do we make money for dataspaces ?

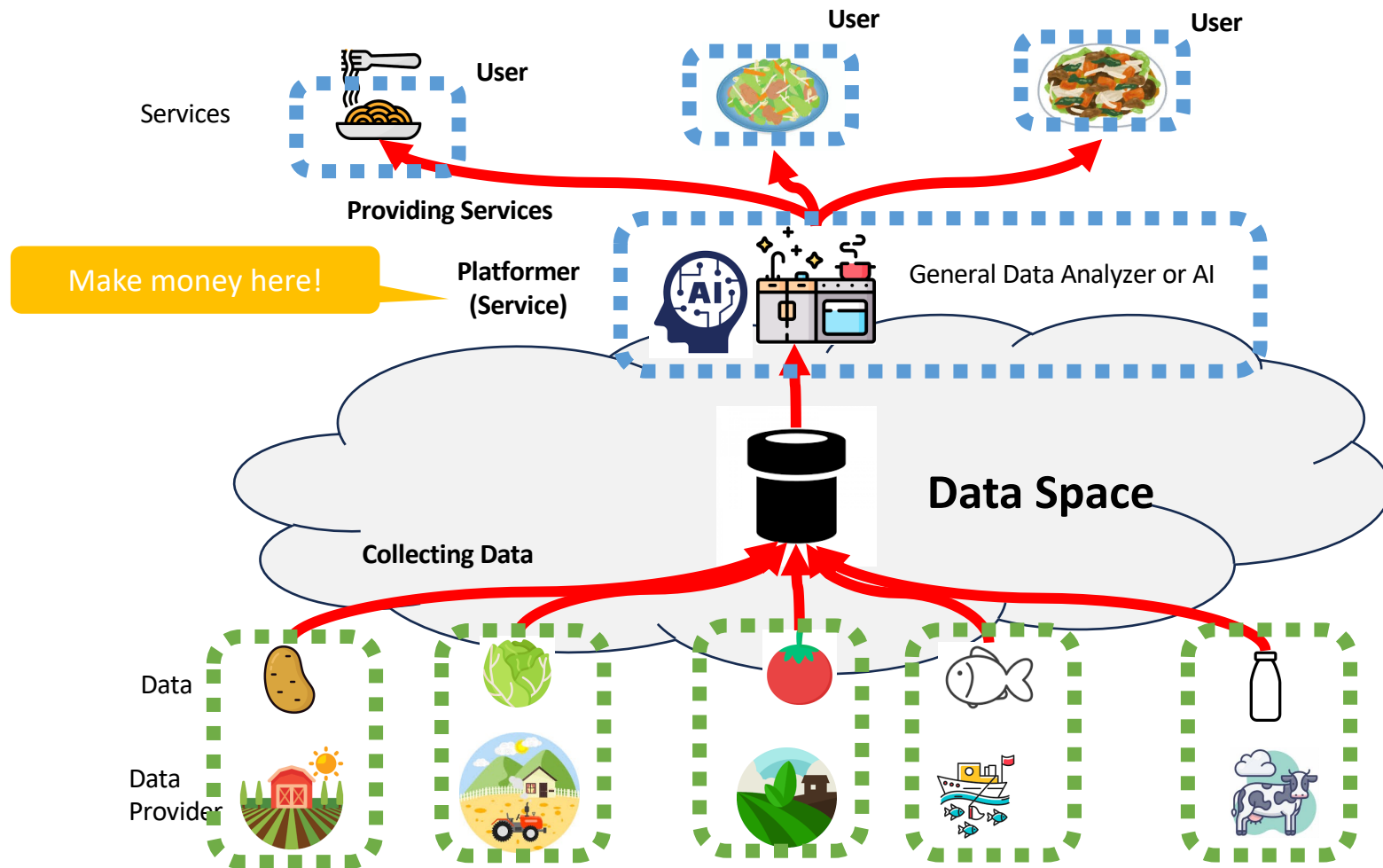
Biz Model of Data Platforms: “Mega Platformer” Model



Biz Model of Data Platforms: Simple “**Dataspaces**” Model



Biz Model of Data Platforms: “Big Analyzer” Model



THANK YOU FOR YOUR ATTENTION!



Noboru Koshizuka / 越塚 登

noboru@koshizuka-lab.org



The EU-Japan Digital Week is an initiative under the EU-Japan Digital Partnership and is supported by the following projects and organisations

