

International Symposium on the Robot Revolution and Industrial IoT 2020

[Session 3] Japan-Germany Expert Forum

Principles of a trusted data infrastructure: German, European, and Japanese Perspectives

October 14, 2020

Council for the Robot Revolution and Industrial IoT Initiative (RRI)

Global Data Management Platform Sub-Working Group

SAKAINO, Akira

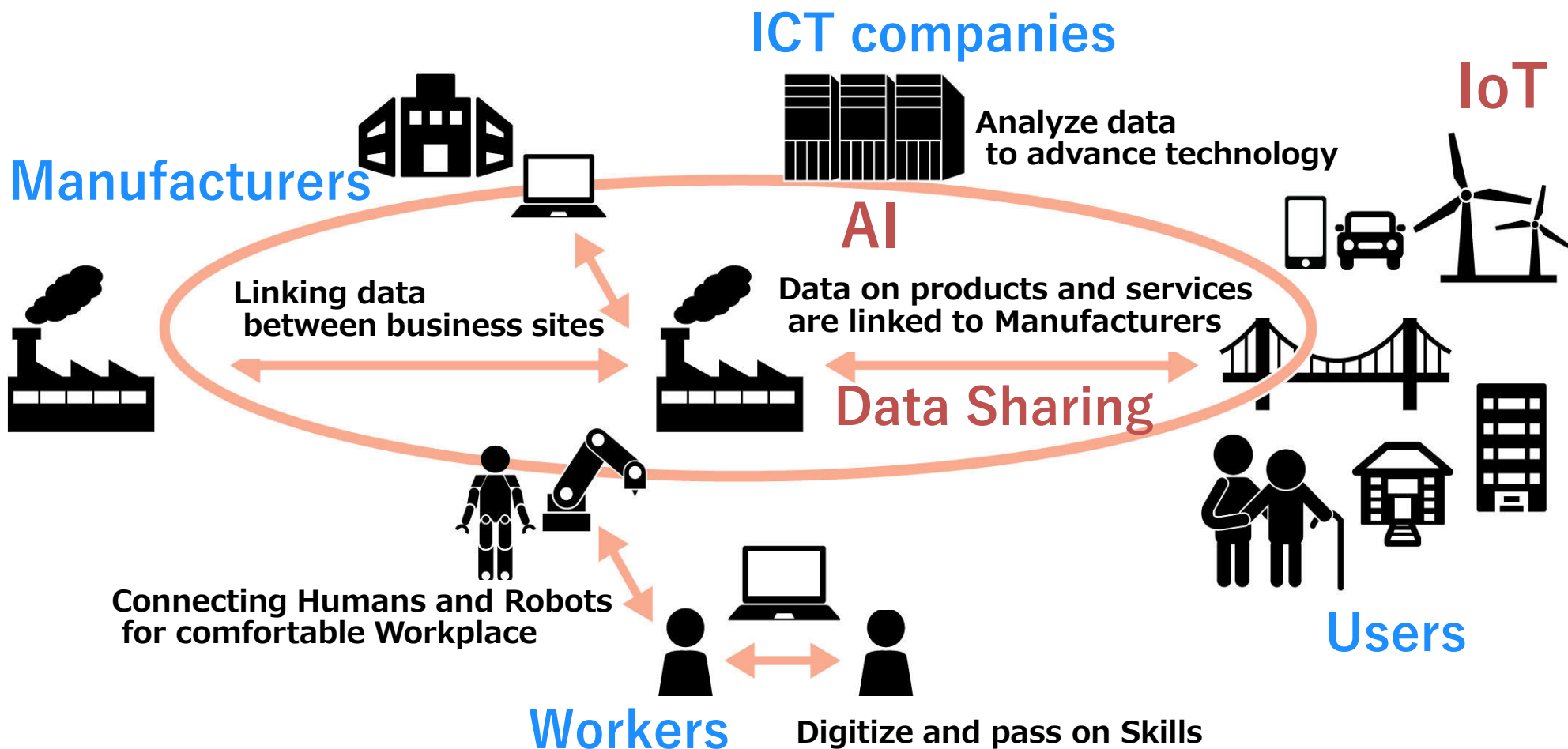
NTT Communications (Global telecom carrier)

akira.sakaino@ntt.com

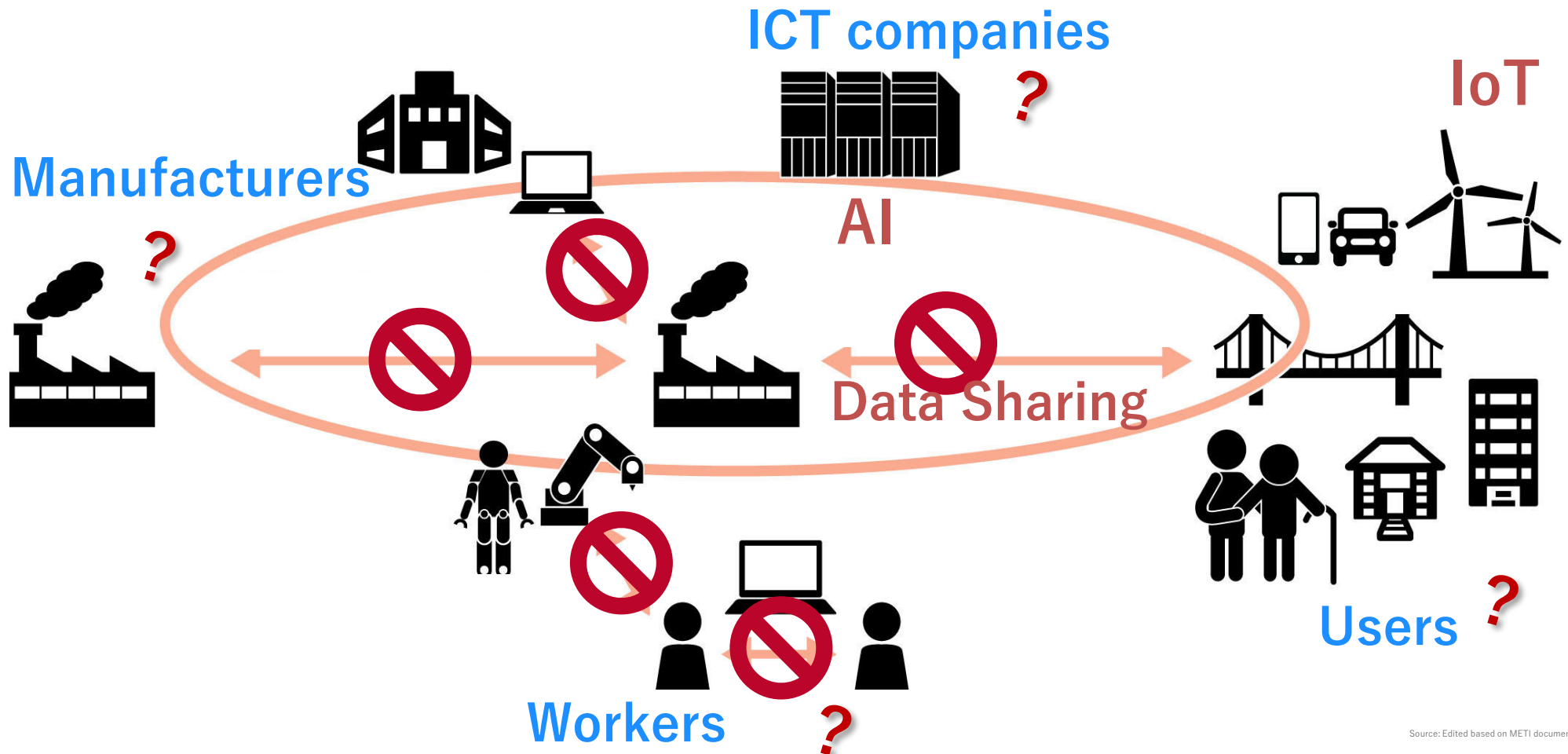
- 1. Trends in Data Management and RRI SWG Activities**
- 2. Requirements for Global Data Management Platform**
(RRI 8 min)
- 3. IDS/GAIA-X Now and Future**
(IDSA 20 min)
- 4. Future Efforts for Data Management in Manufacturing**
(RRI 2 min)

- 1. Trends in Data Management and RRI SWG Activities**
2. Requirements for Global Data Management Platform
3. IDS/GAIA-X Now and Future
4. Future Efforts for Data Management in Manufacturing

All Data is Linked across Industries and Borders,
for Innovation, Productivity, Skill Transmission



In fact, Data is NOT linked enough, and NOT fully utilized...



Source: Edited based on METI documents

- 1 Too many **Old Analog machines**
- 2 Different and **Incompatible Interfaces** are used
- 3 **No good Place** to store Big Data (Integrated?/Distributed?)
- 4 **No Secure system** to share data with **Other** Companies
- 5 **No clear Rules** to share data with **Foreign** Companies
- 6 **Complex** System Operations and Contract Management
- 7 **Cybersecurity** is Difficult and Costly
- 8 Regional **Regulations** for Data Protection
- 9 Risks of **Data Misuse / Unauthorized use**

= > **Need for New System to share data Easily, Globally, and Securely**

- **Governments** and **Companies** recognize the **Importance of Data**
- Creating **Strategies** and **Architectures** for data sharing and innovation
- **Risk of Data Lock-in** by IT Companies and **Data Restriction/Abuse** by Governments

Data Sharing and Utilization

International organization

Commission

Standardization

WORLD
ECONOMIC
FORUM

European
Commission

etc.

Countries and Companies



etc.

Related Organizations

PLATFORM
INDUSTRIE4.0

INTERNATIONAL DATA
SPACES ASSOCIATION

industrial internet
CONSORTIUM

IV Industrial
Value Chain
Initiative

Data
Trading
Alliance

etc.

Data Protection and Restrictions



**Data Lock-in
by Giant Corporation**



**Data Protection
Regulation**



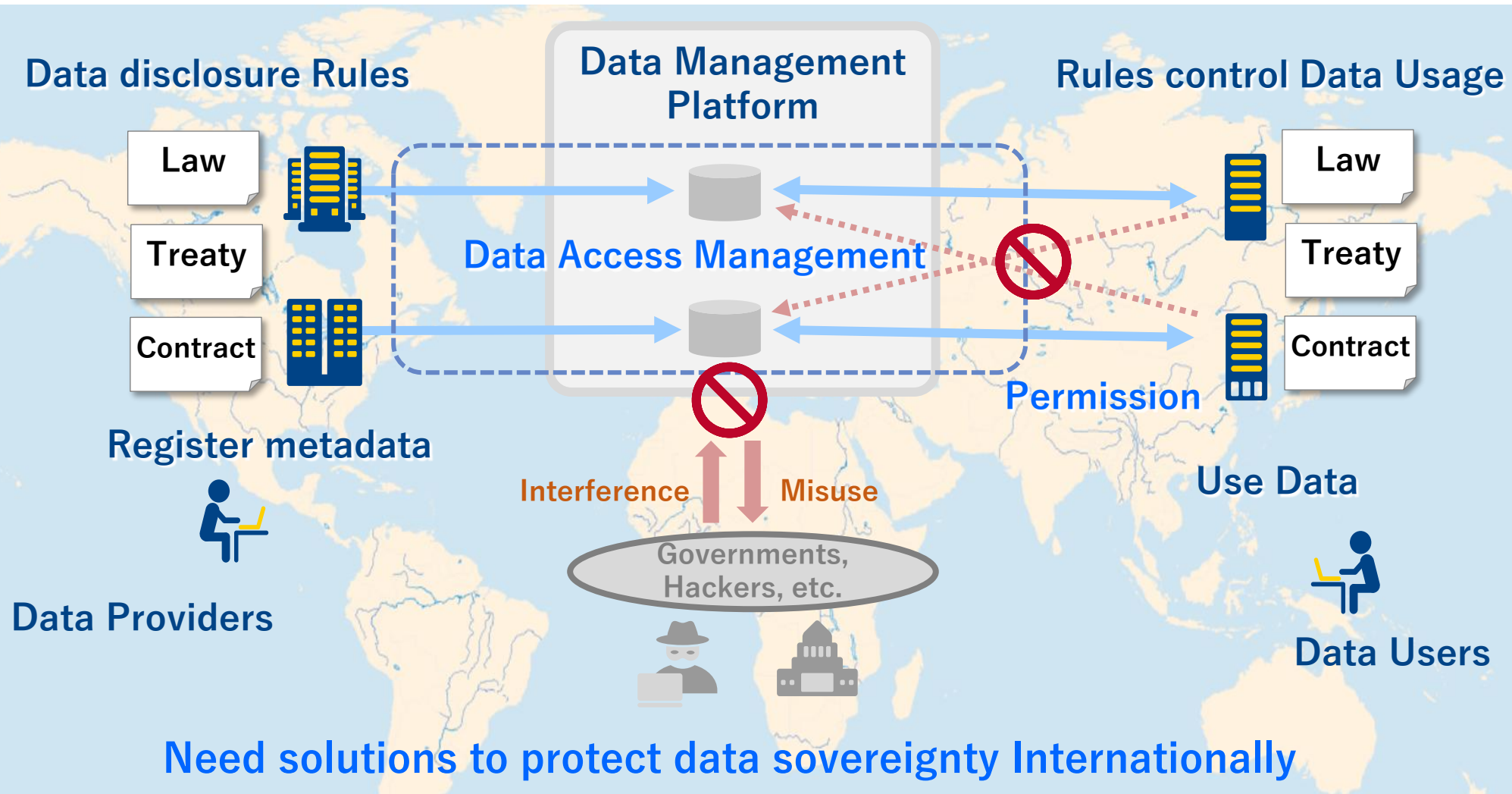
**Government Requests
for Data Disclosure,
Restrictions on Use**



Trends to protect "Data Sovereignty"

Need Fair Common Rules and Platforms for International Data Sharing
JAPAN should also prepare the New Rules and Platforms

Management of Who can use data for What, When, Where, and How,
based on Laws and Contracts



1. SWG Objectives

Creating new Platform that enables companies to **manage** and **share** industrial data **Fairly, Securely,** and **Globally** to solve social problems especially in **Manufacturing**

2. Action plan

- (1) Define **Requirements** for the Platform [From 2019]
- (2) Build a **Demonstration** system for the Platform [Now]
- (3) Develop a **Prototype** of the Platform [From 2021]

3. Participants of SWG

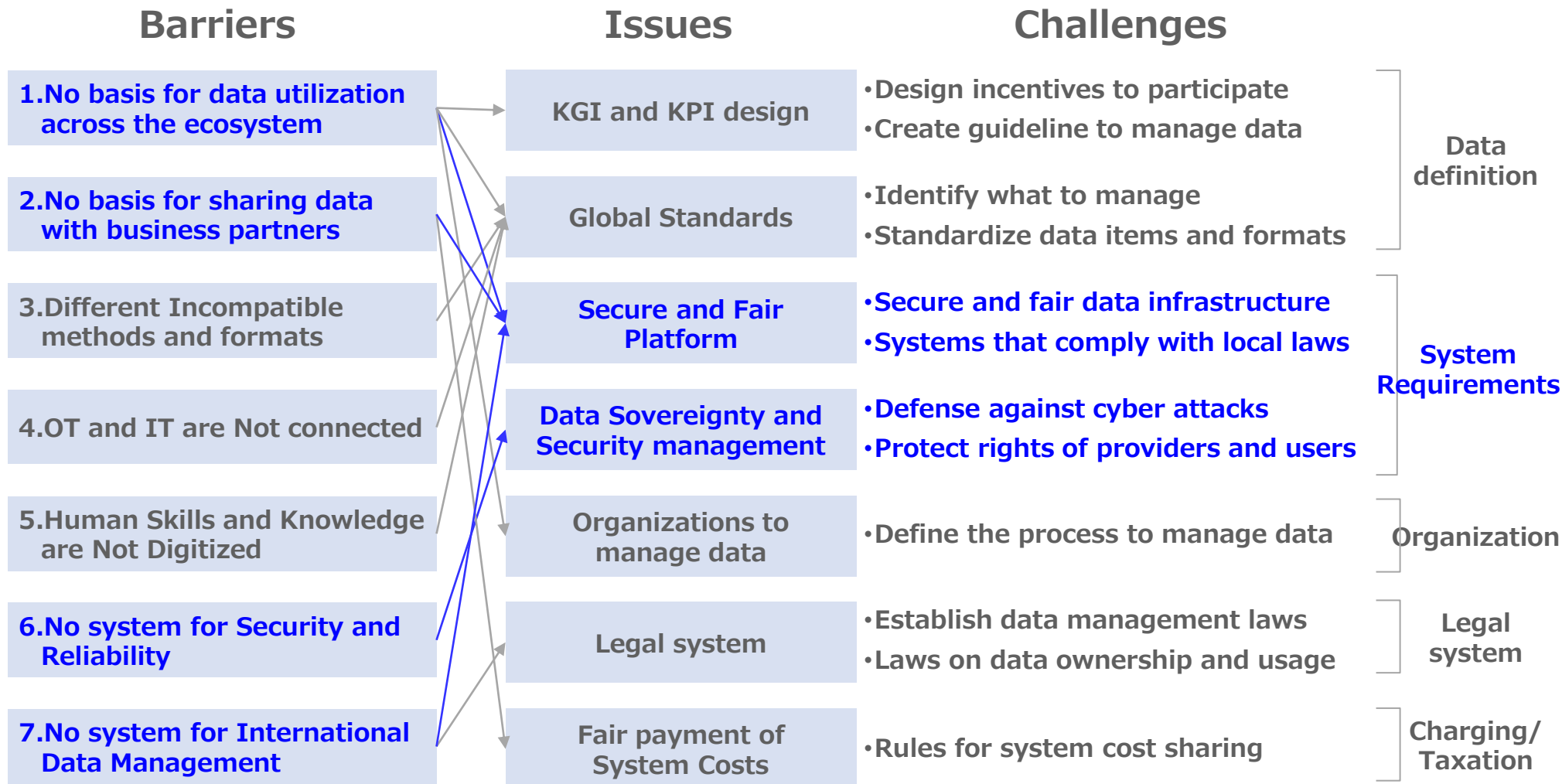
Secretariat: NTT Communications, NTT Laboratories, Qunie

Abeam Consulting, Asahi Kasei, Azbil, Fujitsu, Future, Hitachi, Hitachi Construction Machinery, Hitachi High-Tech, Kawasaki City ICT Coordinator, Microsoft Japan, Mitsubishi Electric, Nomura Research Institute, Panasonic, Siemens, Sumitomo Electric Industries, Suzuki, Uniadex, etc.

(Collaborating with other organizations such as DTA, etc.)

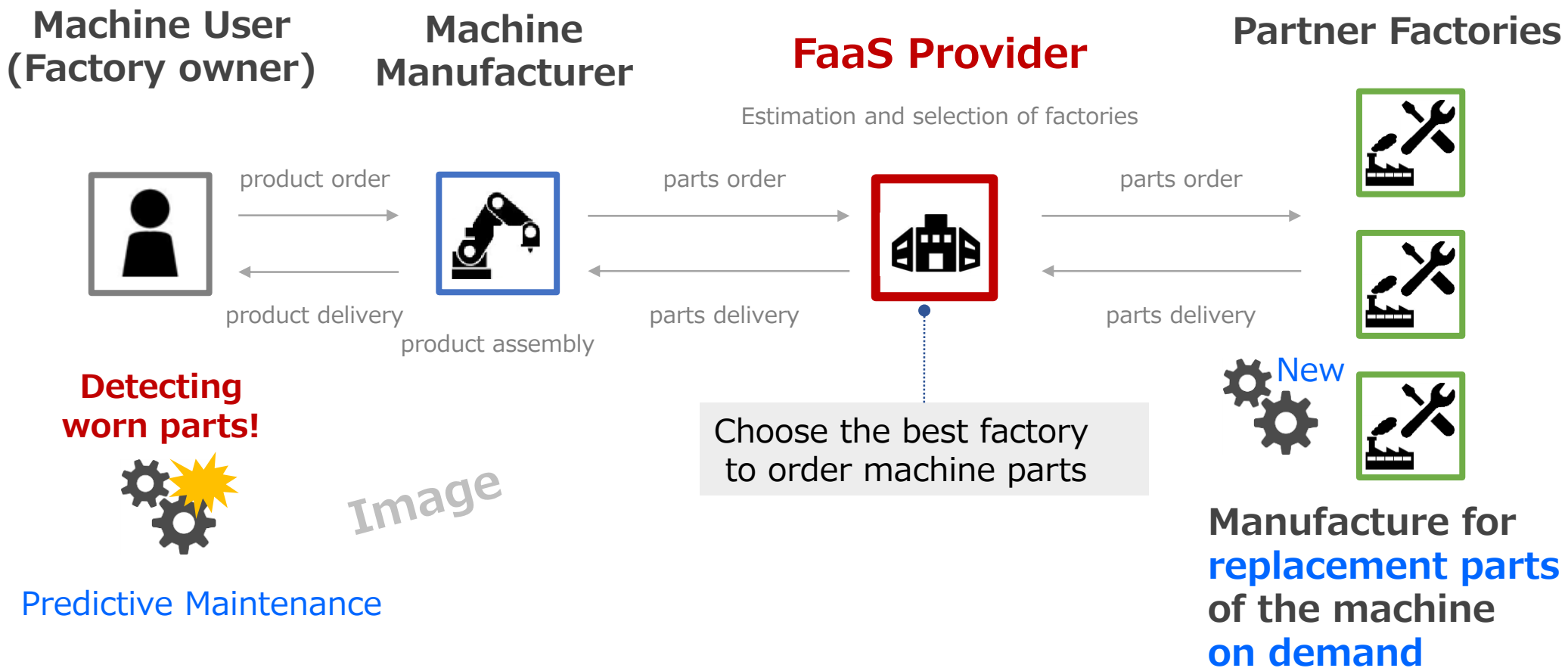
1. Ask SWG Members **What are the Barriers** to share data
2. Focus on **Issues to be discussed by RRI** within each barrier
3. List **Concerns** of data sharing based on specific **Use Cases**
4. Consider **Solutions** to reduce each Concern
5. Identify **System Requirements** to realize the Solutions

1. Ask SWG Members **What are the Barriers** to share data
2. Focus on **Issues to be discussed by RRI** within each barrier



3. List **Concerns** of data sharing based on specific **Use Cases**

Use Case: "Factory as a Service" in Foreign countries (Future business model)





Steps to Define Data Platform Requirements

人間本位の産業を目指して

“Connected Industries”

New vision for the future of Japanese industries

Template to List Concerns of data sharing

Player, Process

		Type of Player			Data processing procedures						
Target	Items to Check	Data Provider	Data Broker	Data User	Register Account	Register Data	Rule Config	Start Operation	Monitor	Change Settings	End of use
Human	Account				Fake data						
	Credit	May be a criminal								Unknown rating scale	
	Authority	Misuse	Misuse	Misuse			Violation				
	Identify			Incorrect login							
	Where										
	When										
											
Product											
IT Device											
Data											
Money											
Rule											

Fill in any Concerns

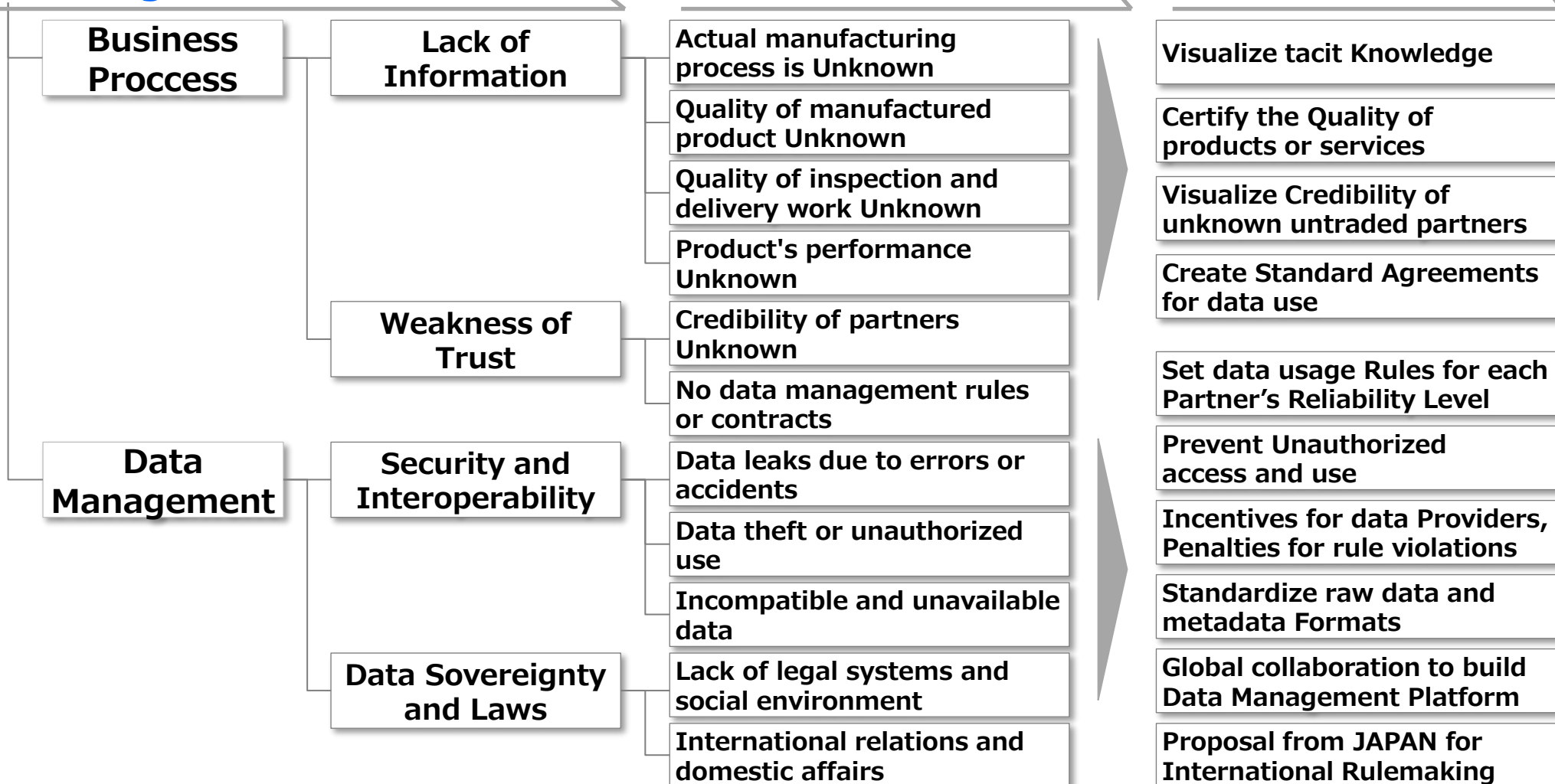
Object to be Managed

4. Consider **Solutions** to reduce each Concern

Categories of Concerns

Concerns in detail

Expected Function and Role

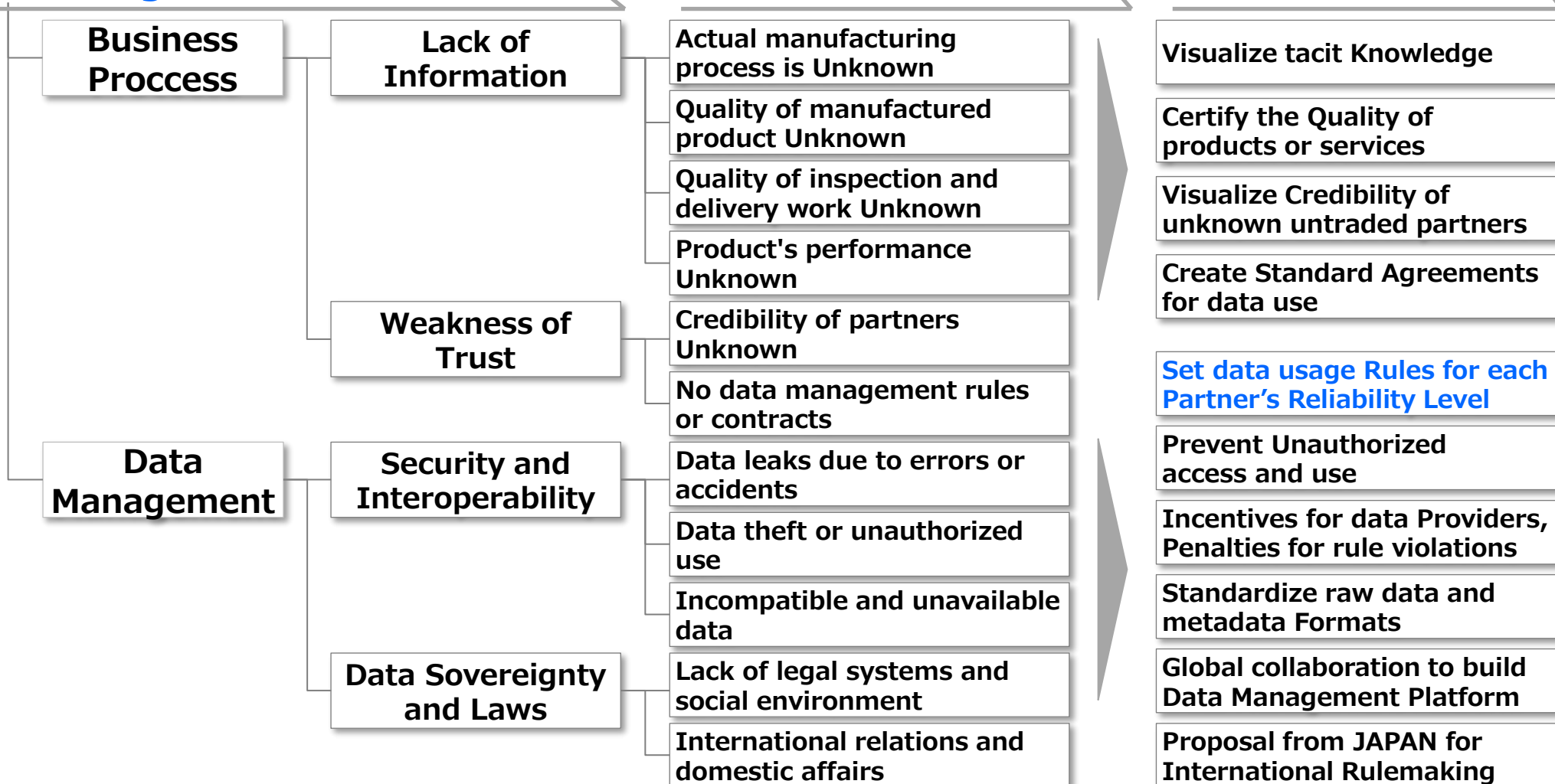


4. Consider **Solutions** to reduce each Concern

Categories of Concerns

Concerns in detail

Expected Function and Role



5. Identify **System Requirements** to realize the Solutions

An Example : **Set data usage Rules for each Partner's Reliability Level**

	Basic Requirements	Details	System Requirements
Rules	Establishment of participation rules for safe and secure transactions (Qualification for participation, standards for certification and quality assurance, etc.)	• Establishment of legal guidelines and rules for data sovereignty • Design of the operating organization	Data providers and users can check each participant's trust
Technology	Development and implementation of functions to authenticate and authorize participants	• user ID registration • User inquiries, authentication, authorization, etc.	Quantify the trust of each participant based on its quality of products, service, and skills
Technology	Development and implementation of functions to control data distribution according to the data provider's policy (Control according to user's ID and security level)	• access control • Data editing, anonymization, etc.	Change the terms of data disclosure depending on the type of data and the trust of the partner
Organization	Establishment of an organization to certify and approve participants (Depending on nationality, trust, security, etc.)	• user review • User Registration • Access authorization, etc.	Establish an organization that fairly certifies each participant's credit score

1. Trends in Data Management and RRI SWG Activities
- 2. Requirements for Global Data Management Platform**
3. IDS/GAIA-X Now and Future
4. Future Efforts for Data Management in Manufacturing

1. Monitoring and Tracking each Data Processing

Each Participant, Hardware, Software, and Data has a unique ID to identify its Origin and Nationality. Each ID is linked to track the input/output and verify the validity of its data's use.

2. Automatic Management of Rules and Legal compliance

Contracts, rules, and laws are made into software modules (processing decision logic), enabling the platform automatically detect conflicts, deviations, and violations.

3. Automatic Data Disclosure Control by Credit Score

The credibility of each participant is scored on a common scale based on its data usage history. The credit score and contract automatically determine the access rights and scope of each data.

4. Automatic Data Disclosure Control by Location Information

Data disclosure can also be controlled based on the location (Country where the counterparty is communicating) detected from GPS or access lines operated by telecom companies.

5. Data Auto Delete/Disable after usage

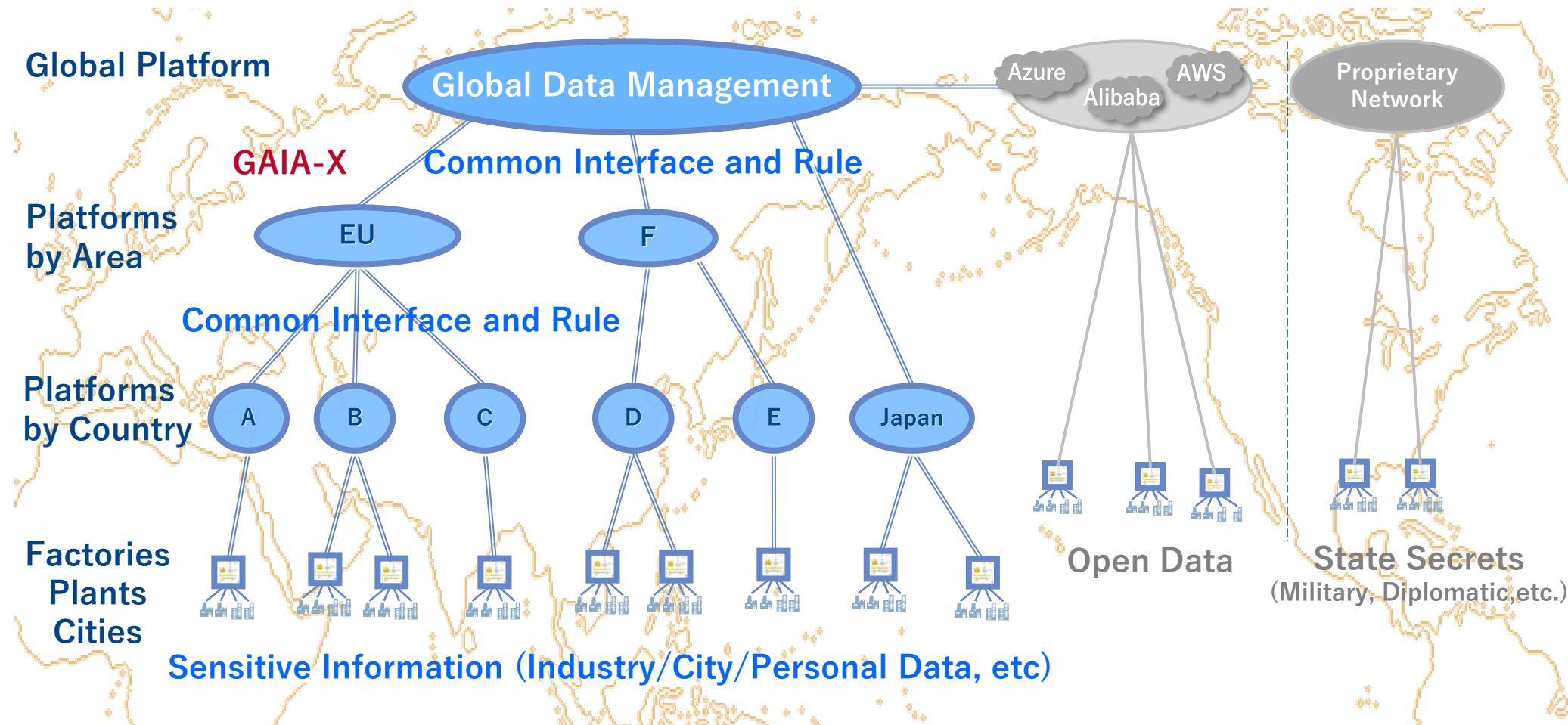
Only authorized participants, hardware and software can use the data. And then, the data is automatically deleted or invalidated at the end of the contract period.

We expect IDS/GAIA-X to help meet these Requirements.

1. Trends in Data Management and RRI SWG Activities
2. Requirements for Global Data Management Platform
- 3. IDS/GAIA-X Now and Future**
4. Future Efforts for Data Management in Manufacturing

1. Trends in Data Management and RRI SWG Activities
2. Requirements for Global Data Management Platform
3. IDS/GAIA-X Now and Future
- 4. Future Efforts for Data Management in Manufacturing**

- Keep **Confidential data** and Open data **physically/logically separate** to govern by different Rules
- Each Country/Region builds and operates a Data Platform **based on its own Laws**
- Interconnect them with a **Common Interface and Rule** for Secure and Fair Data Management



Interconnect EU and Japan Platforms via IDS in the future

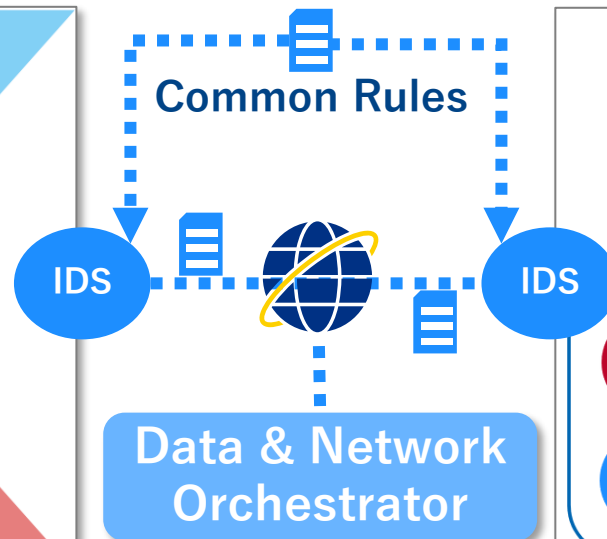
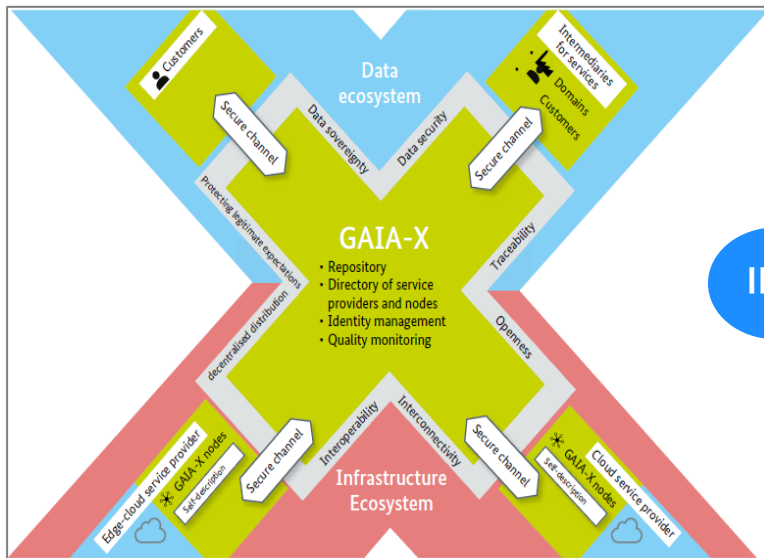
人間本位の産業を目指して

“Connected Industries”

New vision for the future of Japanese industries

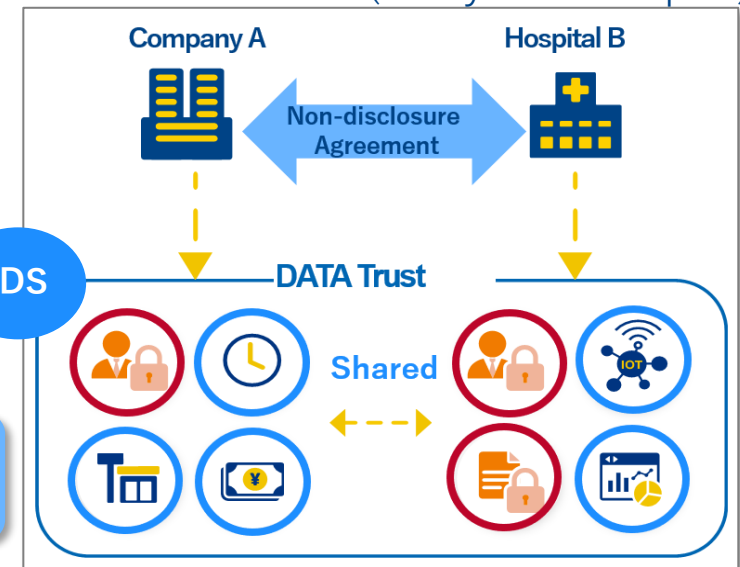
- Both Platforms should be able to connect by a **Common Interface and Rule**
- Develop an Data&Network **Orchestrator** for data access control
- Conduct **PoC for various Use Cases** in cooperation with EU and Japan
- Evolve both Platforms by building and utilizing **International Testbeds**

GAIA-X



Japan's platform

(Not yet developed)



(1) **Discuss together the Requirements** for global data management platform from a **Manufacturing** perspective.

- Identify common points and differences in future vision between IDSA and RRI
- Exchange views on the platform's requirements from the standpoint of EU and Japan

(2) **Promote Cooperation** between Japanese and European **Manufacturers** to realize the Platform.

- Hold workshops for discussions between Japanese and European business people and experts
- Build a testbed to connect European platform (Fraunhofer ISST IDS Laboratory) with Japan, and conduct verification and demonstrations

RRI would also work in cooperation with IDSA and other organizations.

Thank you for your attention

**Lets Collaborate with Europe, Japan and others to create
secure and fair Global Data Management Platform
for the future of Manufacturing
and for all species on the Gaia (Earth)!**

"Connected Industries" for the World