Industrial Data Space Use Case Study in RRI

Robot Revolution and Industrial IoT Initiative
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and
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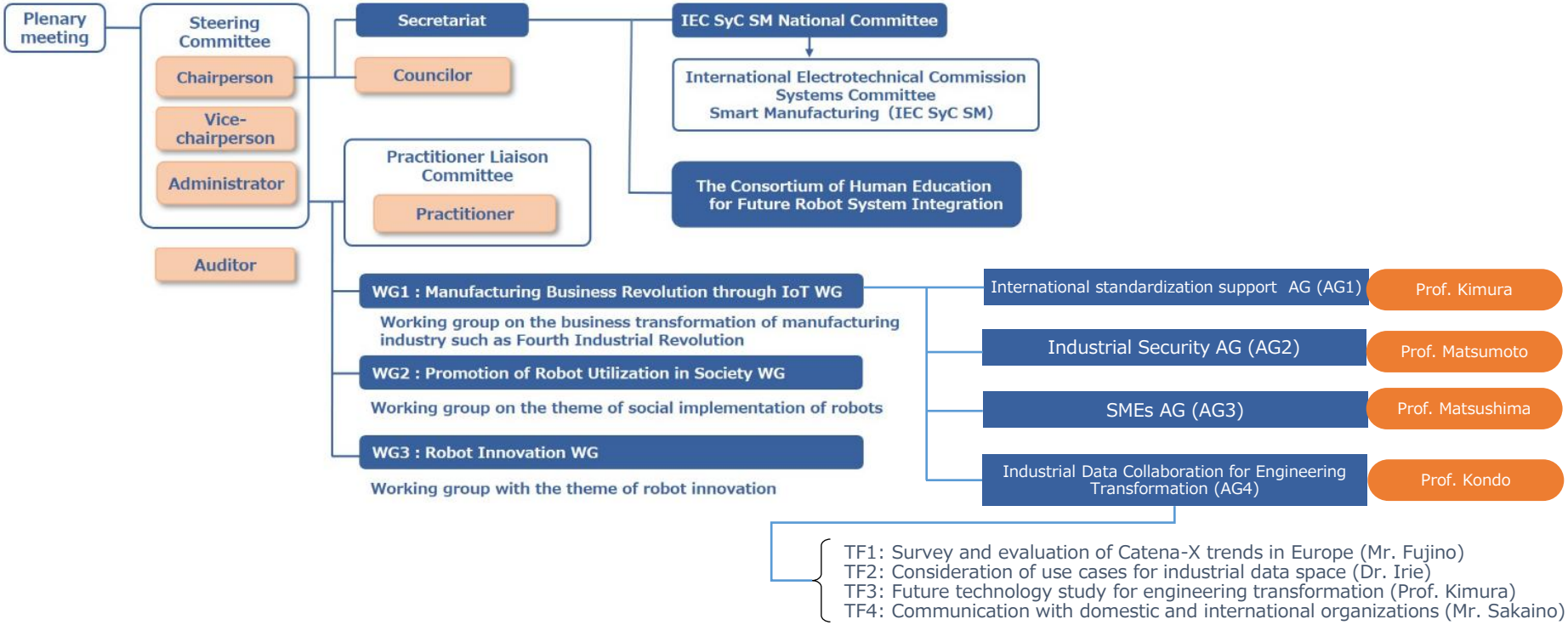
RRI : Robot Revolution and Industrial IoT Initiative

Organization of RRI and AG4

- Established: 2015
- Chairman: Toshiaki Higashihara, Chairman of Hitachi, Ltd.
- Number of members: 247 companies, 69 organizations, 20 research institutes, 13 local governments (as of May 2024)



AG4/ TF2: Consideration of use cases for industrial data space

Purpose

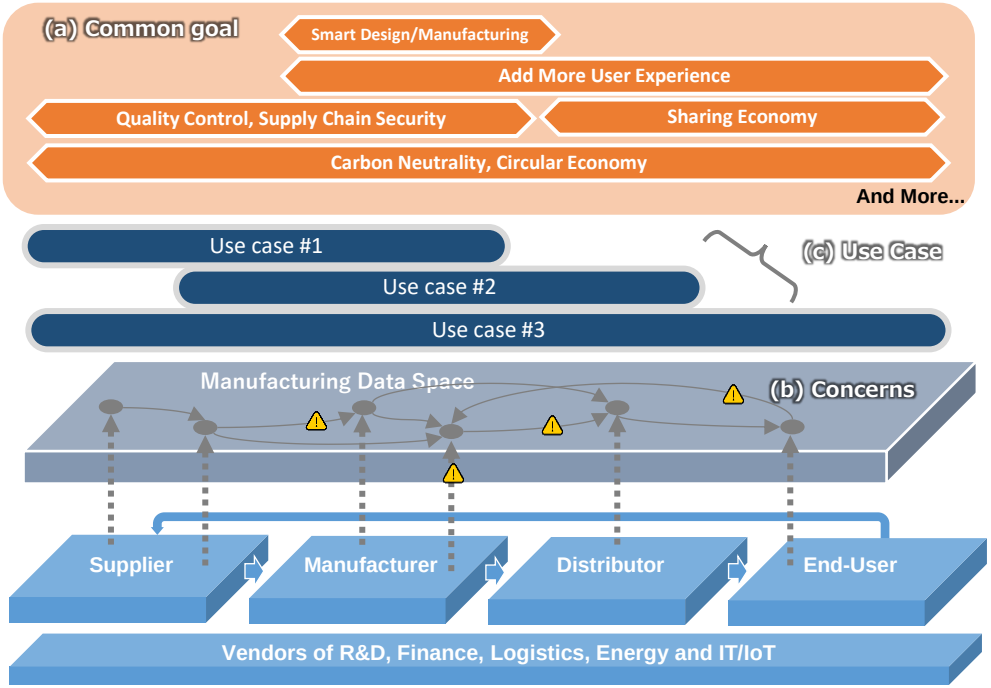
- Taking into account the current status of data space construction in Europe and Japan, and in order to promote widespread use of this data, we will organize the value that can be generated and concerns, and consider use cases in the manufacturing industry.

Member

- User perspective: IHI, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Panasonic, Toshiba, Fanuc, Asahi Kasei, Hitachi
- PF perspective: Fujitsu, NTT Com, Siemens
- General, Consulting: GreenxDigital Consortium, NRI , ABeam, Hitachi Consulting
  (Total 24 people)

What to consider

- To use industrial data space :
  (a) Identifying **common goals** across companies
  (b) Identifying **concerns** regarding data space
  (c) Extraction of use cases

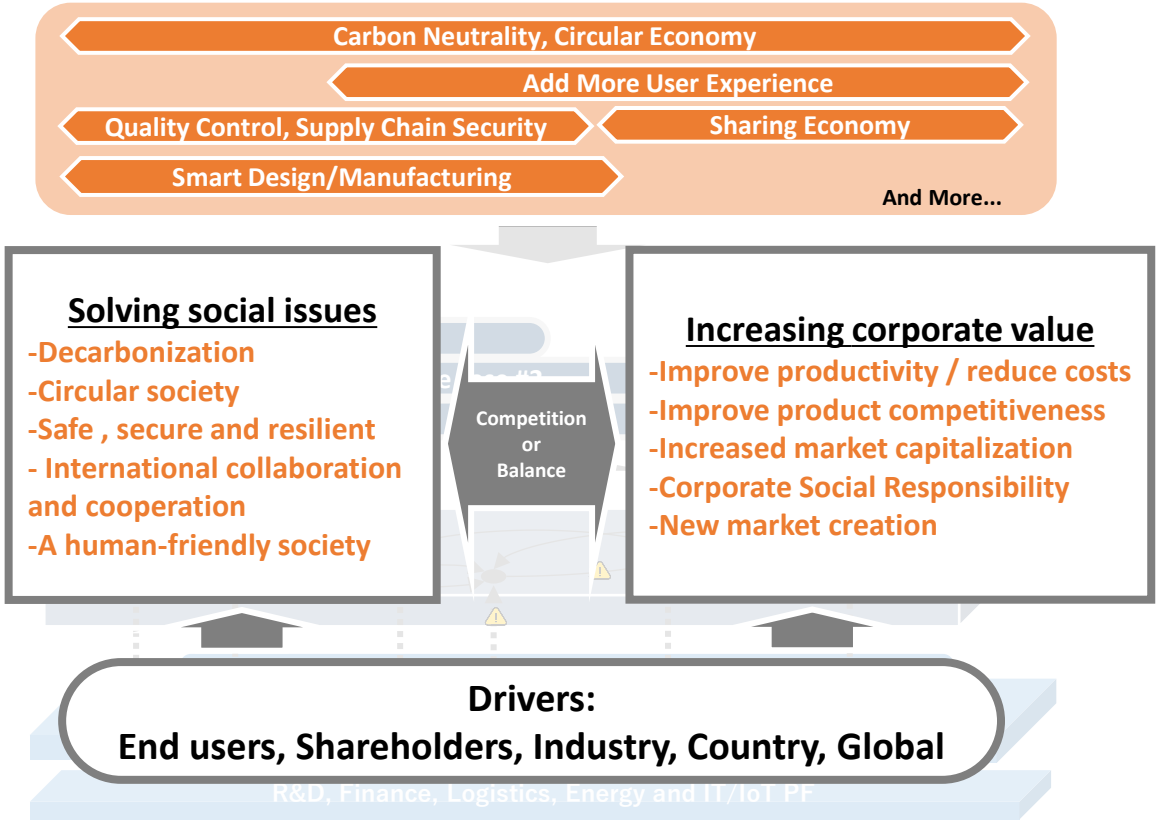


Step 1 : Summary of common goal discussion

① Setting common goal to use data space

< RRI/AG4 discussions>
- The need to solve social issues was understood.
- It is unclear whether data space will lead to increased corporate value.
- External stakeholder promotion need to be considered

<Catena-X/Manufacturing-X opinion>
- Solving problems together that cannot be solved alone
- Building a Win-Win relationship
- Open and frank discussion is needed

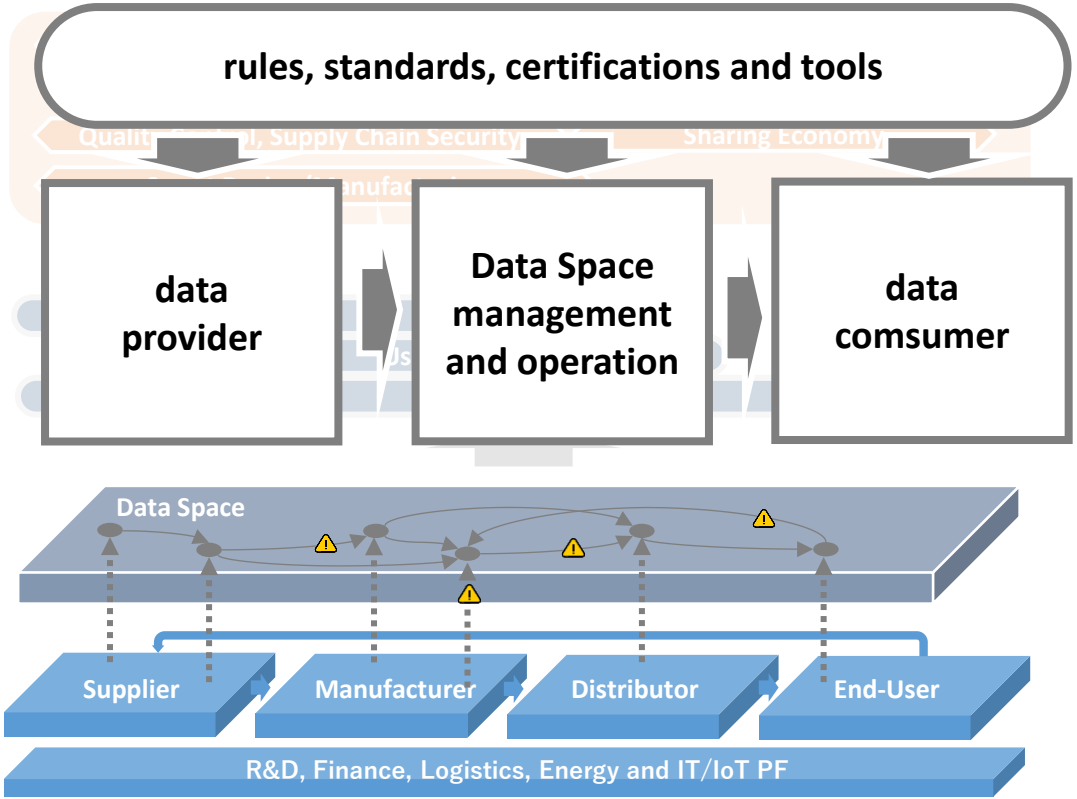


Step 2 : Summary of concerns

< RRI/AG4 discussions>
- There are various concerns (24 in total)
- There are many concerns regarding data space management and operation. Benchmarking and scrutiny are required in the future.
- Many issues have also come up on the data provider side
  (data collection, standard compliance, incentives, etc.)
- Furthermore, it is important to establish rules, standards, certification, tools, etc. surrounding data space.

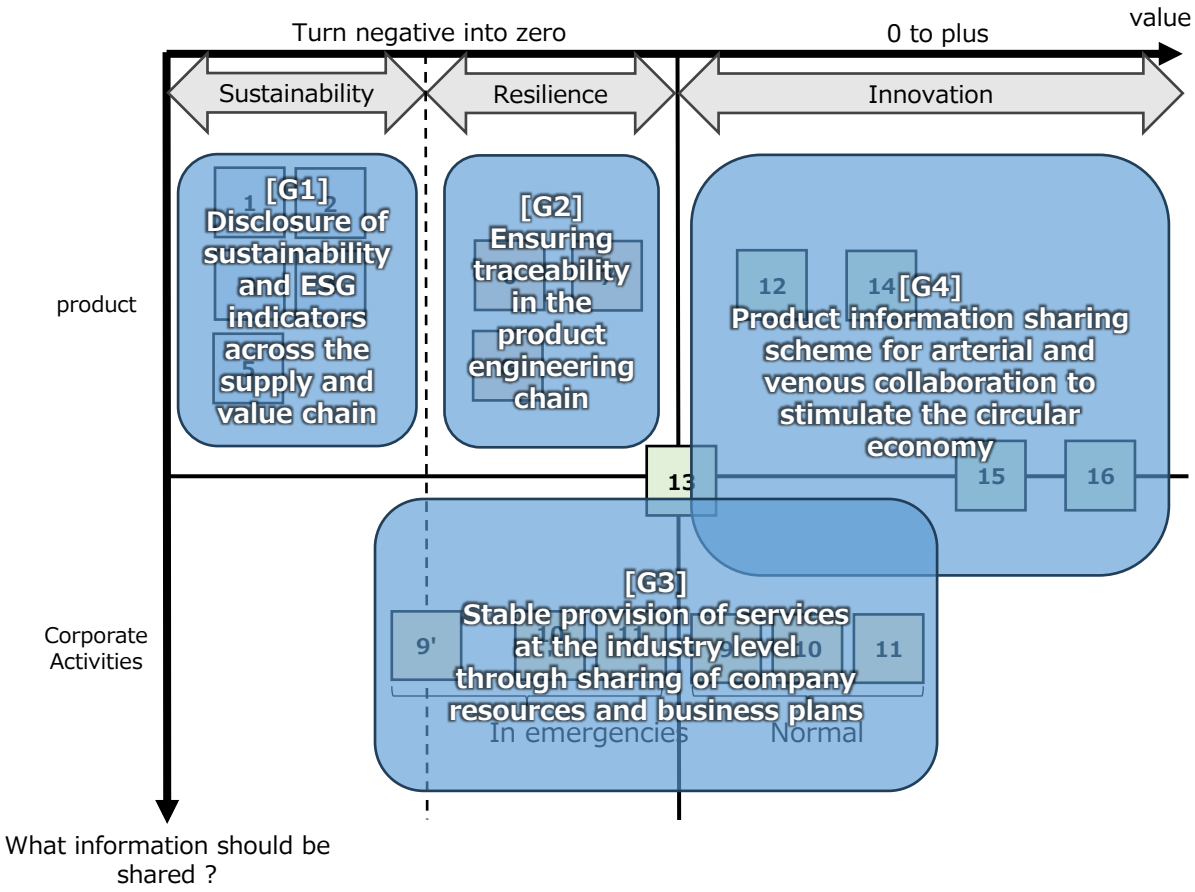
② Concerns of data space from users perspective

<Catena-X/Manufacturing-X opinion>
- Agile solutions with concrete use cases
- Need to recognize the benefits of data sharing within the company



Step 3 : Proposal and grouping of use case drafts

	#	Use case draft
G1	1	ESG quality scoring
	2	Carbon data sharing across the supply chain
	3	Visualization of ethical scores for raw material procurement
	4	Chemical substance information transmission
	5	Sharing information between companies on chemical substances contained in products
G2	6	Aerospace Engineering Data Chain
	7	Product quality traceability
	8	Sharing vulnerability information
G3	9	Maximizing renewable energy use by promoting power supply and demand + storage batteries
	9'	Maximizing renewable energy use by promoting power supply and demand + storage batteries (in emergencies)
	10	Improving logistics efficiency and reducing CO2 emissions, addressing industry issues
	10'	Improving logistics efficiency and reducing CO2 emissions, responding to industry issues (in emergencies)
	11	BCP response Sharing of production and procurement capacity
	11'	BCP response Sharing of production and procurement capacity (in case of emergency)
G4	12	Reducing environmental impact through product life extension and sharing
	13	International interconnection of data spaces
	14	Accelerating innovation with the example of battery recycling
	15	Business model design for cooperation and competition
	16	Activating eco-design through

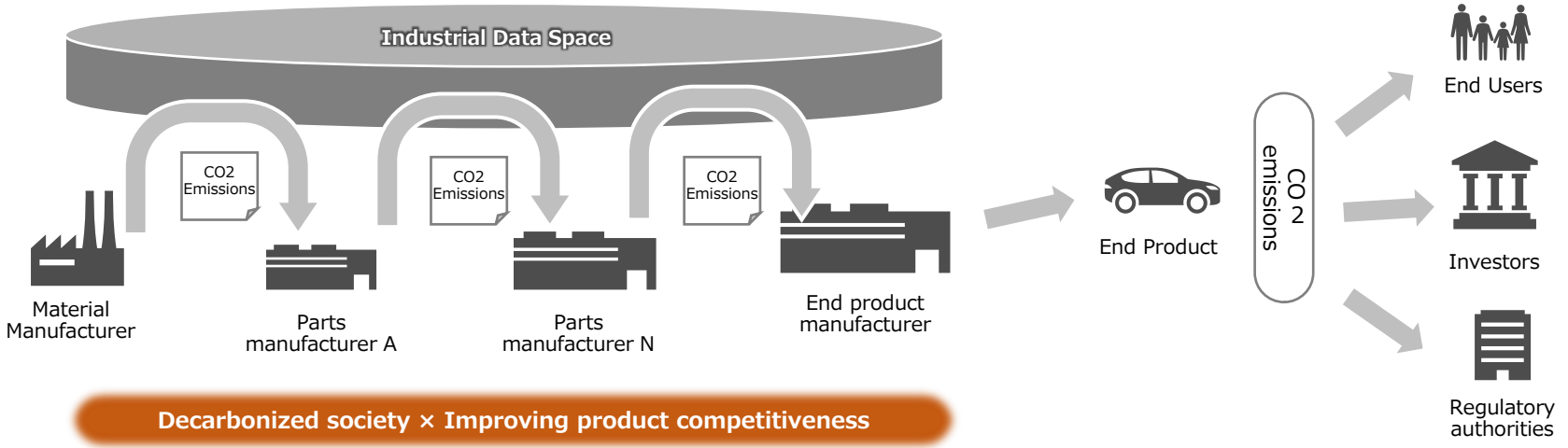


Step 3 : Use case summary

Use Case Name	overview	Social and environmental value	Company Value	Drive Stakeholders	Information to share (representative)
[G1] Disclosure of sustainability and ESG indicators across the supply and value chain	Measure, observe, audit, and visualize the sustainability and ESG management (environmental impact, compliance, governance) throughout the entire lifecycle of a product, and disclose the achievement levels in numerical scores to various stakeholders.	● Decarbonization ● Circular Economy ● Safe, secure and resilient ● A people-friendly society	● **Improving product competitiveness** ● Increasing corporate market capitalization Corporate ● Create new markets	● **International Treaties** ● **Japanese Government Laws and Regulations** ● Shareholders and investors ● Direct customers ● End Customer ● Solution providers	● Product composition information ● Restricted substance information ● **CO2 emissions** ● Fair Trade ● Labor information for collection and distribution
[G2] Ensuring traceability in the product engineering chain	To ensure traceability of HW/SW safety and cybersecurity from the component level to the final product, information within the program engineering chain is shared between companies. The shared information is utilized throughout the entire lifecycle to provide a sense of security and safety to end-users of the product, as well as to service providers and operators who use the product.	● **Safe, secure and resilient** ● Circular Economy ● International collaboration and cooperation	●Improve productivity and reduce costs ● Maintaining and improving product competitiveness ● **Corporate Social Responsibility**	● International treaties, standards,Terms and Agreements ● **Japanese Government Laws and Regulations** ● End Customer (ex. OEM, product users)	● Product composition information (BOM/SBOM) ● Restricted substance information ● **Quality information (including vulnerability information)** ● Regulatory Compliance
[G3] Stable provision of services at the industry level through sharing of company resources and business plans	Various service-receiving businesses (companies, others) provide their demand plans (including surplus information) based on their business plans to a data space. On the other hand, various service-supplying businesses (companies, organizations, others) provide their service supply plans (including resource operation information) based on their business plans to the same data space. From both sets of information, a resource aggregator identifies the supply-demand gaps and implements adjustments or measures to minimize these gaps in each field, thereby aiming to enhance the overall resilience of the industry.	● Decarbonization ● **Safe, secure and resilient** ● A people-friendly society	● **Improve productivity and reduce costs** ● Maintaining and improving product competitiveness ● Corporate Social Responsibility ● Create new markets	● **Company's executives** ● Region (Local governments, local businesses) ● Servicer (such as local aggregators)	● **Electricity demand** ● **Power supply capacity** ● Electricity prices, green certificates ● **Logistics requests and actual information**
[G4] Product information sharing scheme for arterial and venous collaboration to stimulate the circular economy	Disclosure of product information to improve the productivity of the reverse logistics industry (such as material types and content for each component, disassembly methods, etc.), and the introduction of a system to evaluate the contribution to the circular economy based on the level of information disclosure.	● **Circular Economy** ● Safe, secure and resilient	● Maintaining and improving product competitiveness Corporate Social Responsibility ● **Create new markets**	● Government ● **Recycling material manufacturer** ● **Consumer goods manufacturers** ● Consumers ● Local governments ● Logistics and recycle serviesers	● **Dismantling method (CAD, process)** ● **Recycling included in parts** ● **Target substances and content** ● Deterioration of materials over time ● Recommended recycling methods

Use case G1 "Disclosure of ESG indicators of products"

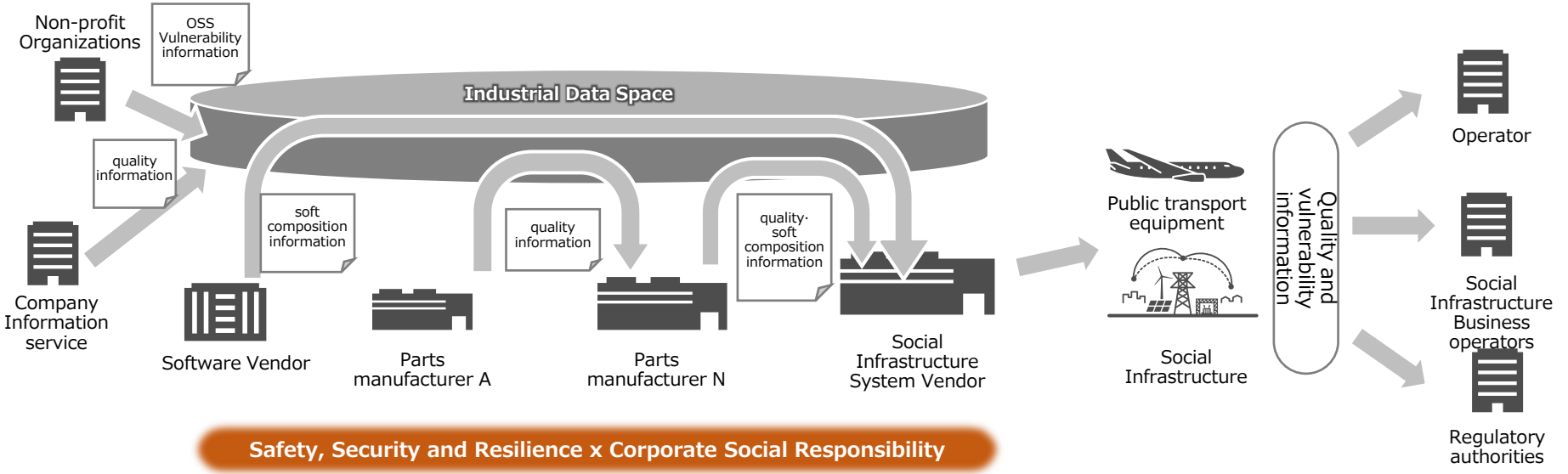
Use Case Name	overview	Social and environmental value	Company Value	Drive Stakeholders	Information to share (representative)
[G1] **Disclosure of sustainability and ESG indicators across the supply and value chain**	Measure, observe, audit, and visualize the sustainability and ESG management (environmental impact, compliance, governance) throughout the entire lifecycle of a product, and disclose the achievement levels in numerical scores to various stakeholders.	● Decarbonization ● Circular Economy ● Safe, secure and resilient ● A people-friendly society	● **Improving product competitiveness** ● Increasing corporate market capitalization Corporate ● Create new markets	● **International Treaties** ● **Japanese Government Laws and Regulations** ● Shareholders and investors ● Direct customers ● End Customer ● Solution providers	● Product composition information ● Restricted substance information ● **CO2 emissions** ● Fair Trade ● Labor information for collection and distribution



Decarbonized society × Improving product competitiveness

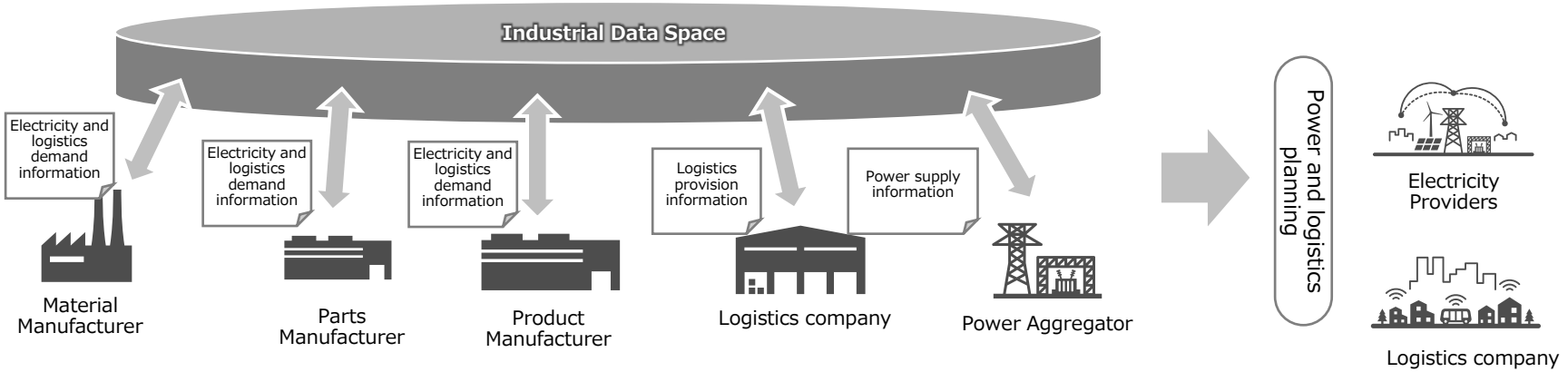
Use Case G2 "Quality Information Traceability"

Use Case Name	overview	Social and environmental value	Company Value	Drive Stakeholders	Information to share (representative)
[G2] **Ensuring traceability in the product engineering chain**	To ensure traceability of HW/SW safety and cybersecurity from the component level to the final product, information within the program engineering chain is shared between companies. The shared information is utilized throughout the entire lifecycle to provide a sense of security and safety to end-users of the product, as well as to service providers and operators who use the product.	● **Safe, secure and resilient** ● Circular Economy ● International collaboration and cooperation	●Improve productivity and reduce costs ● Maintaining and improving product competitiveness ● **Corporate Social Responsibility**	● International treaties, standards,Terms and Agreements ● **Japanese Government Laws and Regulations** ● End Customer (ex. OEM, product users)	● Product composition information (BOM/SBOM) ● Restricted substance information ● **Quality information (including vulnerability information)** ● Regulatory Compliance



Use case G3 "Inter-company resource sharing"

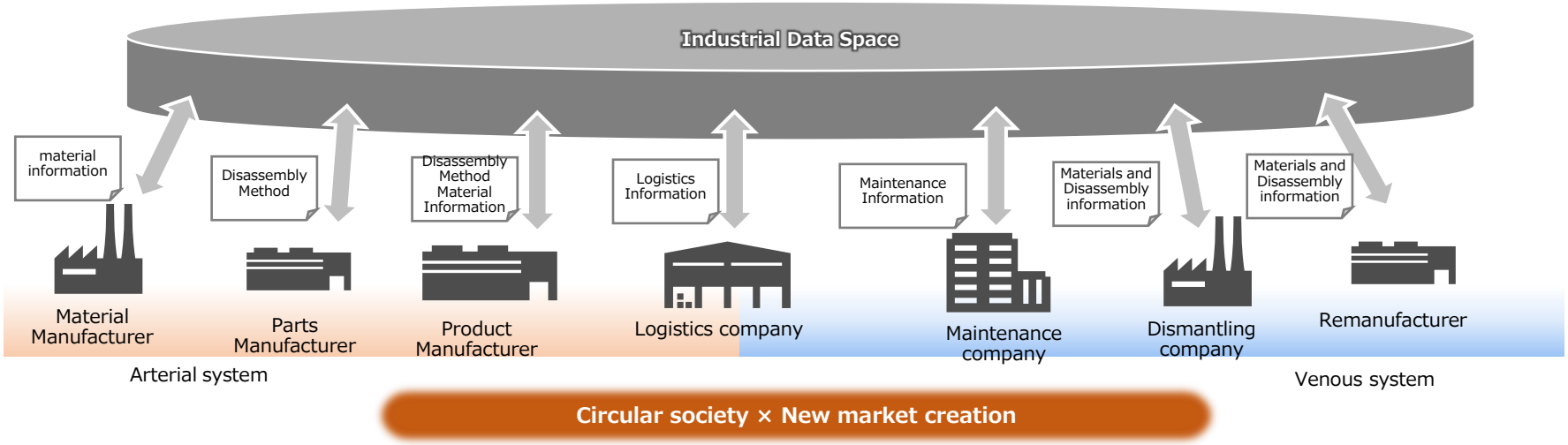
Use Case Name	overview	Social and environmental value	Company Value	Drive Stakeholders	Information to share (representative)
[G3] **Stable provision of services at the industry level through sharing of company resources and business plans**	Various service-receiving businesses (companies, others) provide their demand plans (including surplus information) based on their business plans to a data space. On the other hand, various service-supplying businesses (companies, organizations, others) provide their service supply plans (including resource operation information) based on their business plans to the same data space. From both sets of information, a resource aggregator identifies the supply-demand gaps and implements adjustments or measures to minimize these gaps in each field, thereby aiming to enhance the overall resilience of the industry.	● Decarbonization ● **Safe, secure and resilient** ● A people-friendly society	● **Improve productivity and reduce costs** ● Maintaining and improving product competitiveness ● Corporate Social Responsibility ● Create new markets	● **Company's executives** ● Region (Local governments, local businesses) ● Servicer (such as local aggregators)	● **Electricity demand** ● **Power supply capacity** ● Electricity prices, green certificates ● **Logistics requests and actual information**



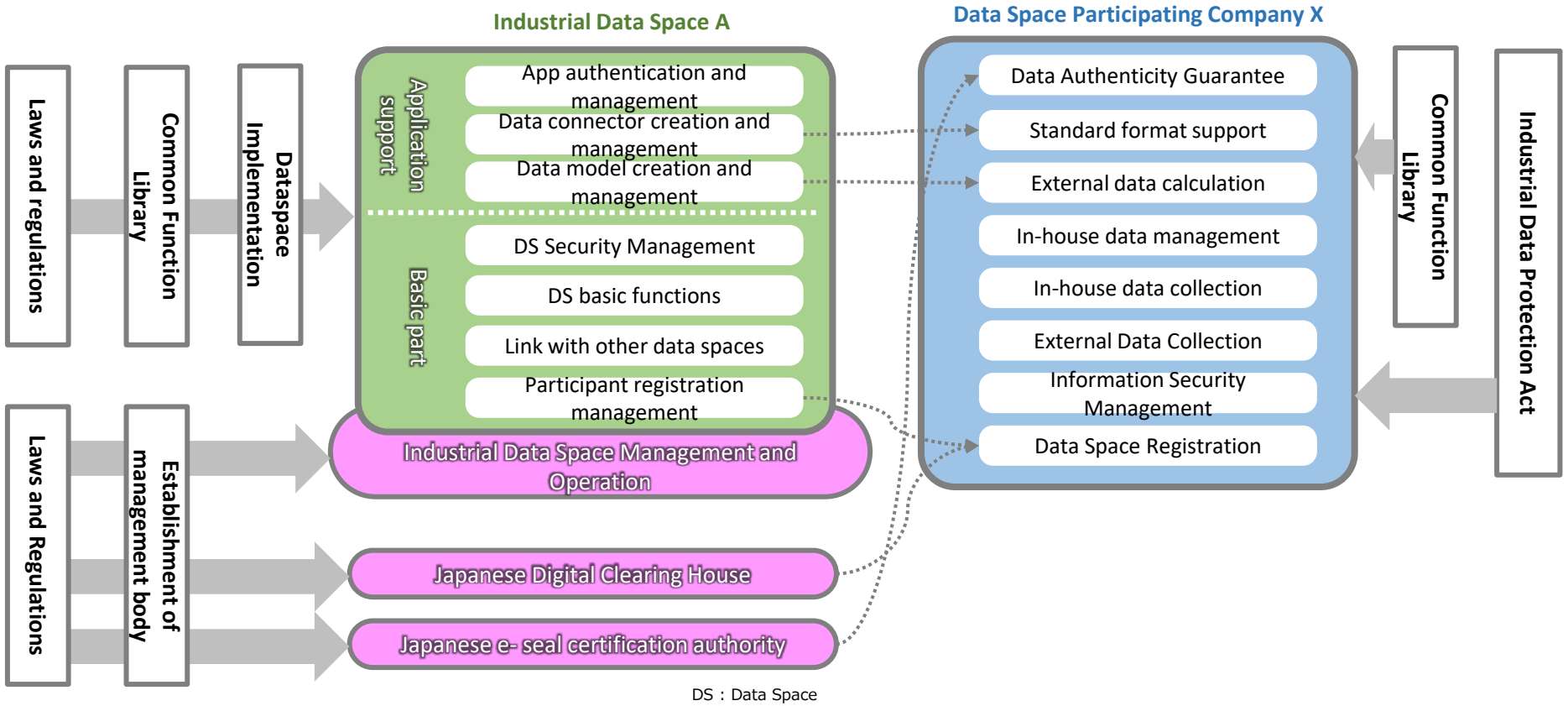
Safety, security and resilience x improved productivity / reduced costs

Use Case G4 "Sharing product information for circular economy"

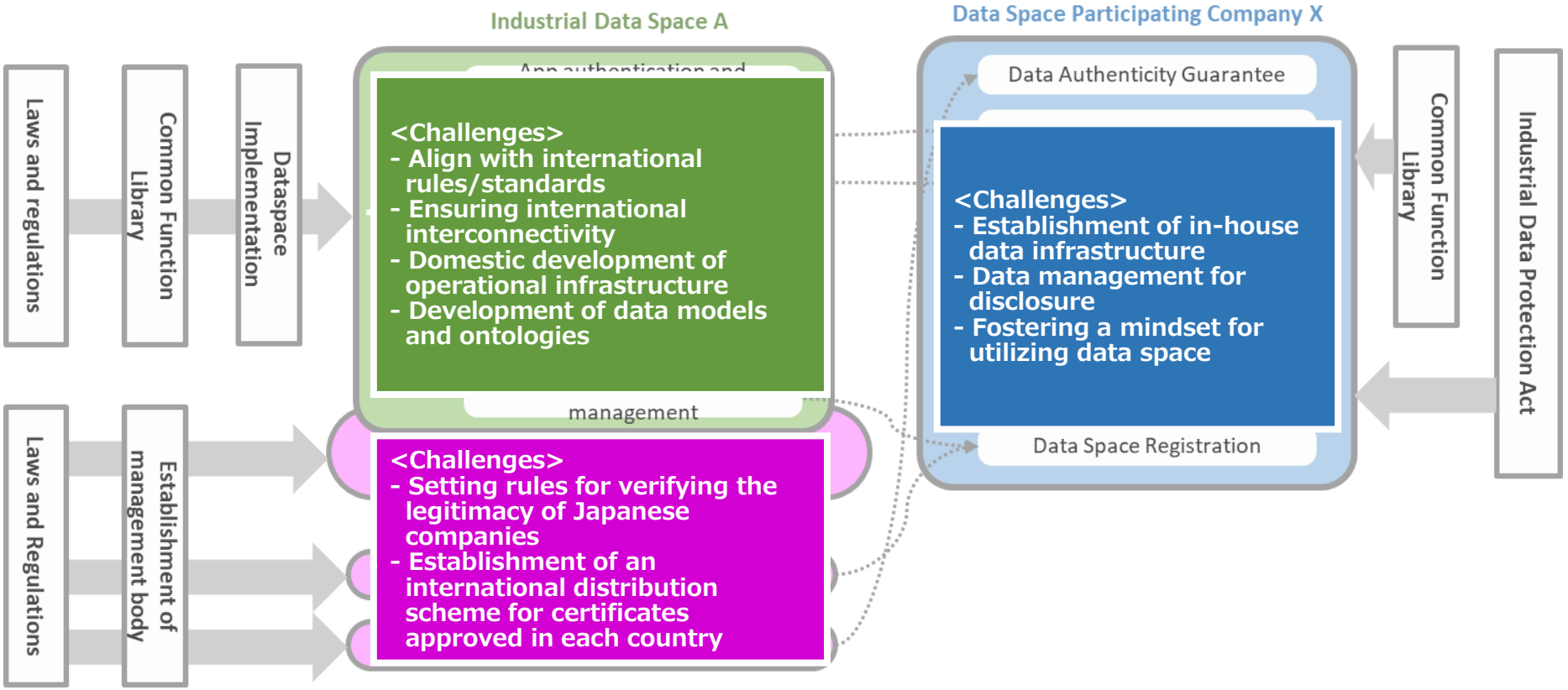
Use Case Name	overview	Social and environmental value	Company Value	Drive Stakeholders	Information to share (representative)
[G4] **Product information sharing scheme for arterial and venous collaboration to stimulate the circular economy**	Disclosure of product information to improve the productivity of the reverse logistics industry (such as material types and content for each component, disassembly methods, etc.), and the introduction of a system to evaluate the contribution to the circular economy based on the level of information disclosure.	● **Circular Economy** ● Safe, secure and resilient	● Maintaining and improving product competitiveness Corporate Social Responsibility ● **Create new markets**	● Government ● **Recycling material manufacturer** ● **Consumer goods manufacturers** ● Consumers ● Local governments ● Logistics and recycle serviesers	● **Dismantling method (CAD, process)** ● **Recycling included in parts** ● **Target substances and content** ● Deterioration of materials over time ● Recommended recycling methods



Step 3 : How to make it ?

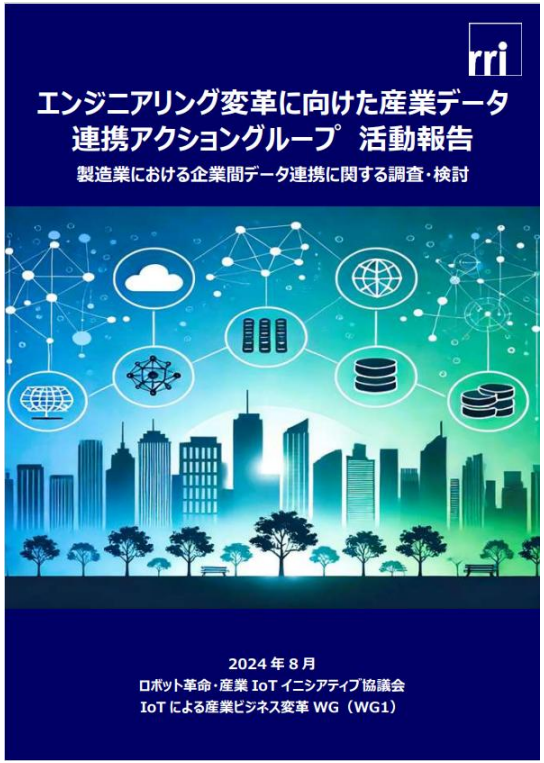


Step 3 : How to make it ?



Output

Report from RRI ('24/8)



White Paper on Manufacturing Industries from METI ('24/5)

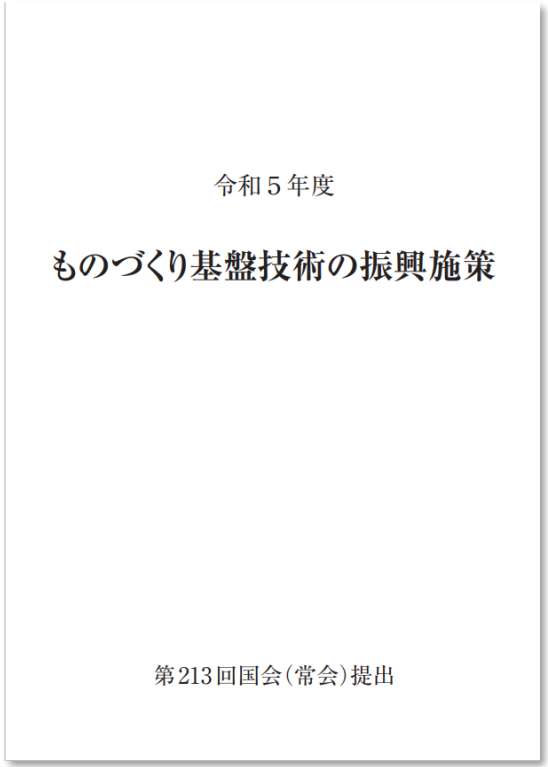
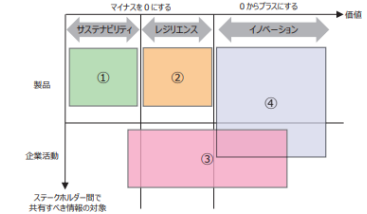


表523-7　産業データ連携によって達成される共通ゴール

企業価値の創出	生産性向上・コスト削減
	製品競争力維持・強化
	企業時価総額向上
	企業の社会的責任の達成
	新規市場の創出
社会的・環境的価値の創出	脱炭素の実現
	循環社会の実現
	安心・安全／レジリエントな社会の実現
	国際連携・協調
	ヒトに優しい社会の実現

資料：（株）d-strategy,inc「製造業における企業間データ連携の進展に向けた調査」（2024年3月）から経済産業省作成

図523-8　ユースケースグループの整理



①サプライチェーン・バリューチェーン全体におけるサステナビリティ及びESG指標の開示	③企業リソース・事業計画シェアリングによる業界レベルでのサービス安定提供
製造物のESG品質スコアリング	電力需給＋蓄電池推進による再生可能エネルギー使用最大化
サプライチェーン全体でのカーボンデータ連携	物流の効率化とCO2排出削減、業界課題対応
原料調達の倫理スコア可視化	BCP対応、生産・調達余力共有
含有化学物質情報伝達	④循環経済を活性化する動静脈連携に向けた製品情報共有スキーム
製品含有化学物質の企業間情報共有	製品寿命延長・シェアリングによる環境負荷低減
②プロダクトエンジニアリングチェーンにおけるトレーサビリティ確保	データスペースの国際相互接続
航空宇宙業界のエンジニアリングデータチェーン	蓄電池の循環を例にしたイノベーションの加速化
製造物品質トレーサビリティ	環境分野における協調と競争のビジネスモデル設計
脆弱性情報の共有	データ循環によるエコデザイン活性化

資料：（株）d-strategy,inc「製造業における企業間データ連携の進展に向けた調査」（2024年3月）から経済産業省作成

Proposal to Japanese government from Keidanren

Towards the creation of an industrial data space

Keidanren
Policy & Action

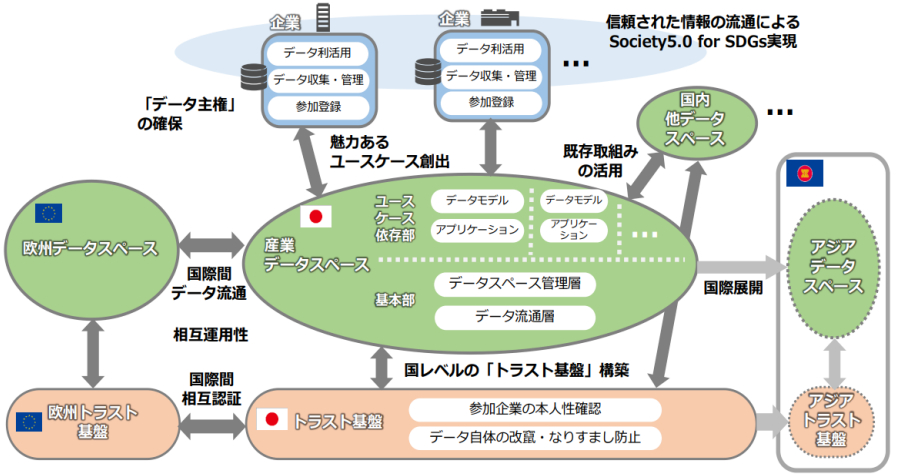
産業データスペースの構築に向けて
（概要）

2024年10月15日
一般社団法人 日本経済団体連合会

Ⅰ. はじめに：現状および課題

図：目指すべき産業データスペースのイメージ

【出典】ロボット革命・産業 IoT イニシアティブ協議会（RRI）



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経団連：産業データスペースの構築に向けて（2024-10-15）(keidanren.or.jp)

Scope of the "Towards creating Industrial Data Space"