

SM4RTENANCE

Trusted Data Sharing for Manufacturing Equipment Industry

Oscar Lazaro
Innovalia

EU ECONOMIC SPACES

1993



EUROPEAN SINGLE MARKET

European Economic & industrial transformation

2023



EUROPEAN COMMON DATA SPACES

Industrial & public administration digital transformation. European data economy pillar

2030

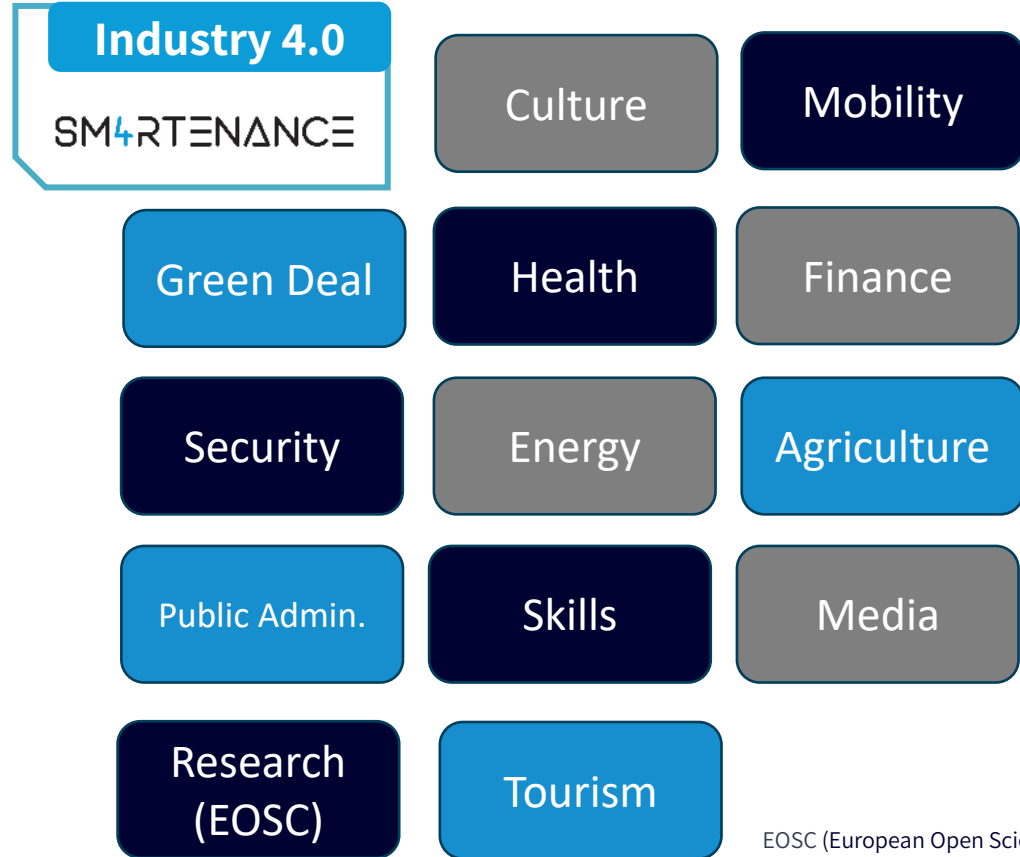


European Net-Zero Spaces

Industrial green transformation

EU DATA STRATEGY

14 EUROPEAN COMMON DATA SPACES



EOSC (European Open Science Cloud)

SM4RTENANCE



SM4RTENANCE

European Deployment of Smart
Manufacturing Asset 4.0 Multilateral Data
Sharing Spaces for an Autonomous
Operation of Collaborative Maintenance
and Circular Services

Project No: 101123490

Duration: 36 Months

Start Date: 1st October 2023

Consortium: : 42 full partners, 5 associated partners,
distributed across 11 EU countries.

Strategic Objective: DIGITAL-2022-CLOUD-AI-03-DS-MANUFACT

Total Budget: 14 M €

EC Contribution: 8M€

Project Website: sm4rtenance.eu

SM4RTENANCE

innovalia
ASSOCIATION

DAWEX
data exchange technology

top-ix
WE DO CONNECTIONS

NTT DATA

OTE
GROUP OF COMPANIES

SCSN
smart connected
supplier network

domina
data management

FIWARE
FOUNDATION

SOVITY

DGS
BUILDING THE FUTURE

SQS
SOFTWARE QUALITY SYSTEMS

TRIMEK
METROLOGICAL ENGINEERING

Cefriel
POLITECNICO DI MILANO



PRIMA
INDUSTRIE

FIDIA



Schneider
Electric

FIIL YOUR FUTURE

DATAPIXEL
QUALITY CONTROL ENGINEERING

TNO



core

IJSSEL

UNIMETRIK
METROLOGY AND CALIBRATION

ATLANTIS
ENGINEERING

SYXIS
innovate together

Fraunhofer
IOSB

INDUSTRIE 4.0
AUSTRIA



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



AVL

BEMAS



BAI DATA

MADE
Competence Center i4.0

AFNeT Services

INTELLIMECH
CONSORZIO PER LA MECCATRONICA

VDMA

carsa

eit Manufacturing
CLC SOUTH

**ASSOCIATED
PARTNERS**

efnms

**INTERNATIONAL DATA
SPACES ASSOCIATION**

VDI

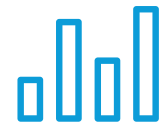
SIEMENS

VTT

DATA-DRIVEN TRANSFORMATION



BOOST DATA SHARING



80%

Industrial Data is Never Used

<https://www.europarl.europa.eu/news/en/headlines/society/20220331STO26411/boosting-data-sharing-in-the-eu-what-are-the-benefits>



ONE DATA,
ONE USE

A close-up photograph of two hands shaking in a firm grip, symbolizing partnership and agreement. The hands are positioned in the center of the frame, with the fingers interlocked. The background is a blurred, light-colored surface, possibly a table or desk. The overall image has a blue-tinted overlay.

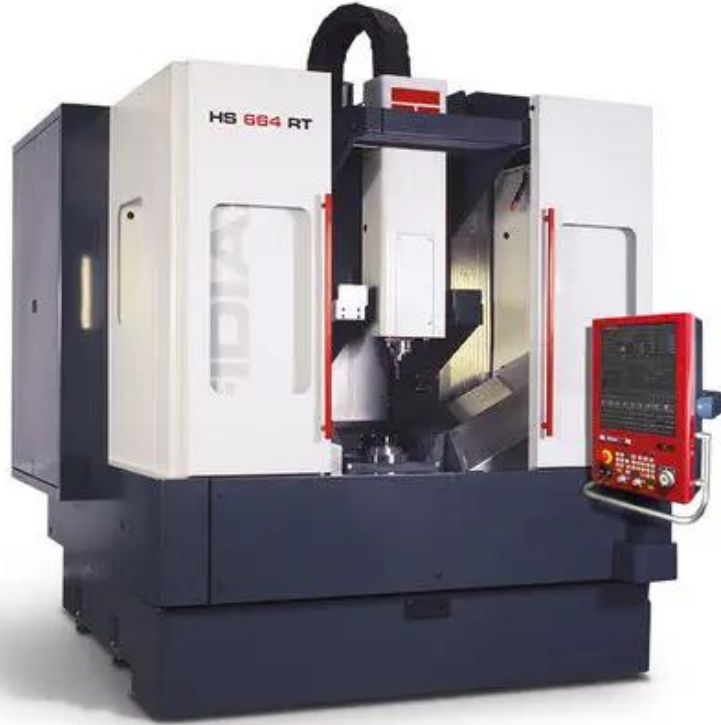
ONE PARTNER,
ONE PROJECT

EU DATA SPACE 4.0 – WHAT IS IT?

*“A **DISTRIBUTED** SYSTEM DEFINED BY A **GOVERNANCE FRAMEWORK** THAT ENABLES **SECURE AND TRUSTWORTHY DATA TRANSACTIONS** BETWEEN PARTICIPANTS WHILE SUPPORTING **TRUST AND DATA SOVEREIGNTY**. A DATA SPACE IS IMPLEMENTED BY **ONE OR MORE INFRASTRUCTURES** AND ENABLES **ONE OR MORE USE CASES**”.*



DATA SPACES
SUPPORT CENTRE



ASSETS 4.0

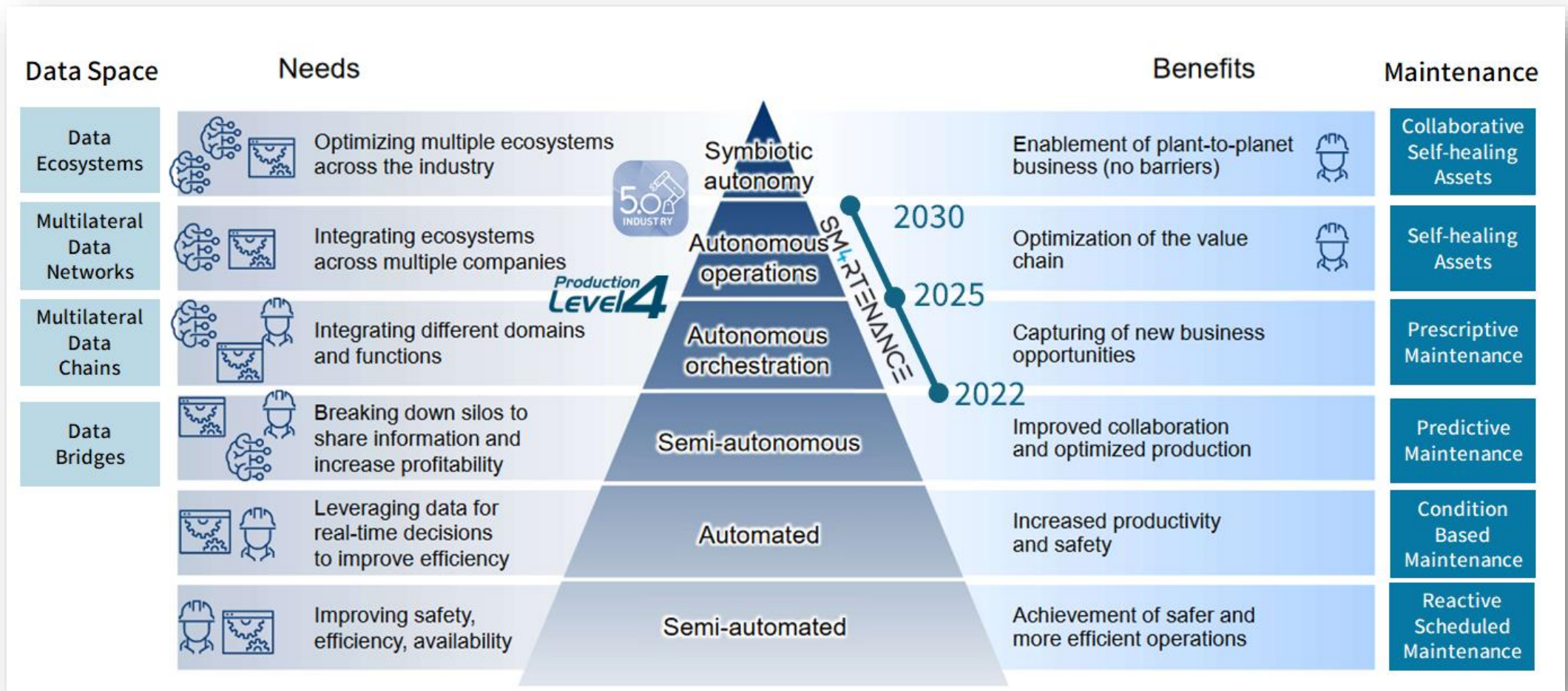
CROSS-SECTORIAL GLOBAL DATA SPACES

SM4RTENANCE MISSION

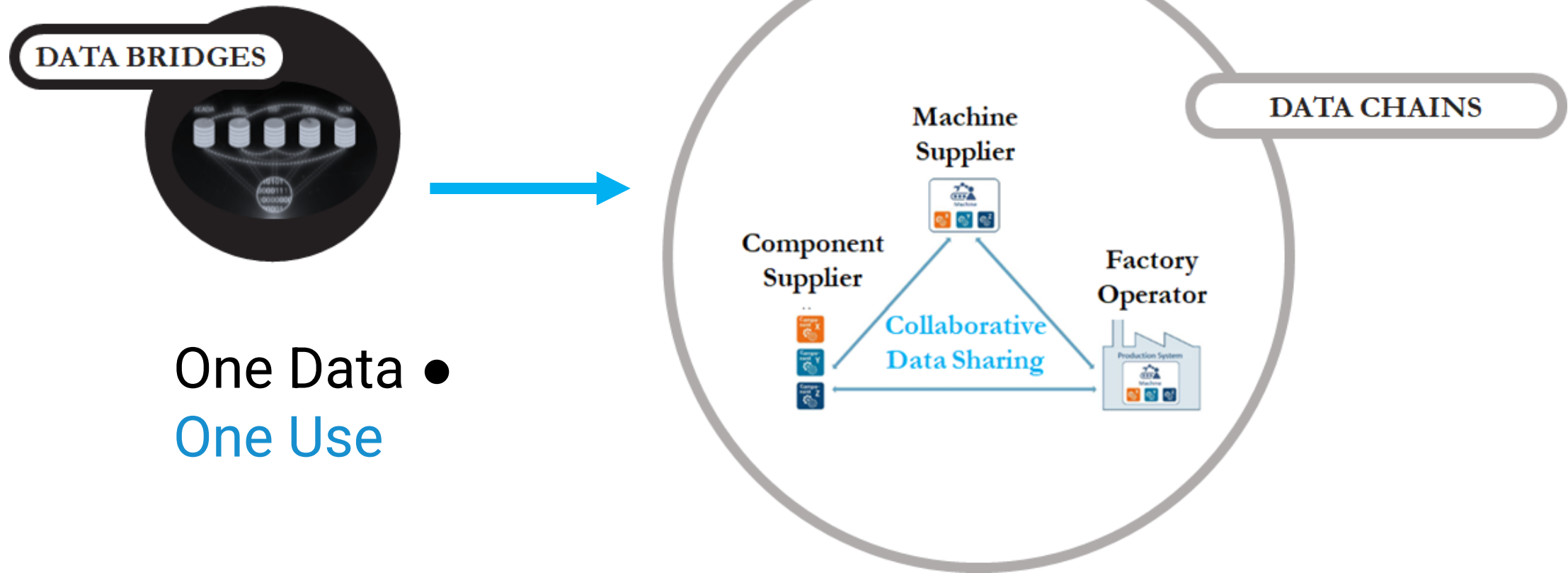
*“TO FACILITATE A NEUTRAL
CROSS-SECTORIAL DATA SPACE
WHERE DATA CAN BE PROVIDED
ALONG THE COMPLETE ASSET
LIFECYCLE FROM THE DIFFERENT
STAKEHOLDERS INTERACTING
WITH THE ASSET 4.0”.*



DATA-DRIVEN ASSET 4.0 VISION

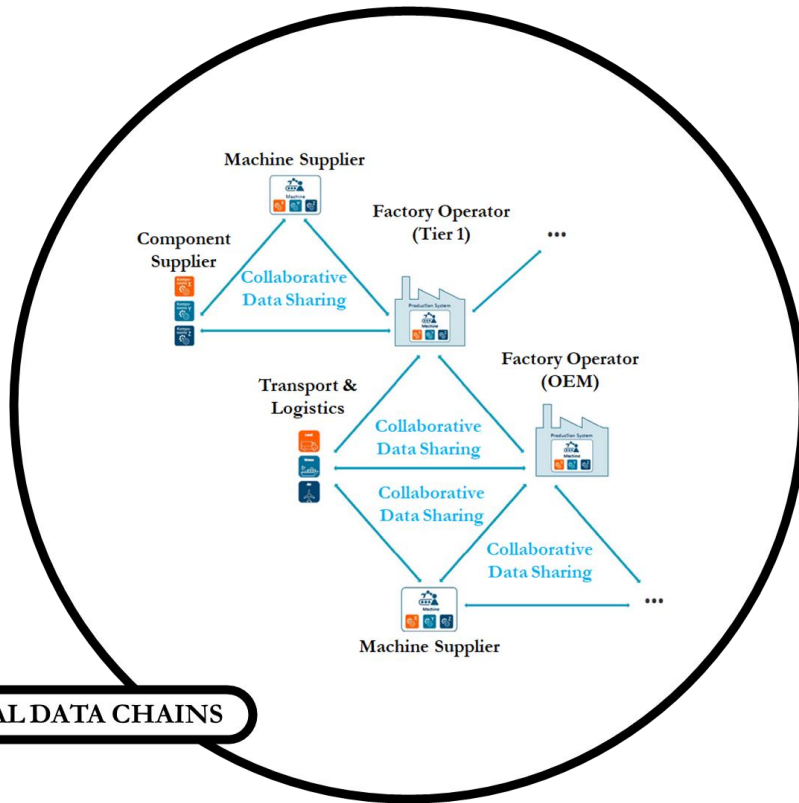


GLOBAL MANUFACTURING NETWORK EVOLUTION

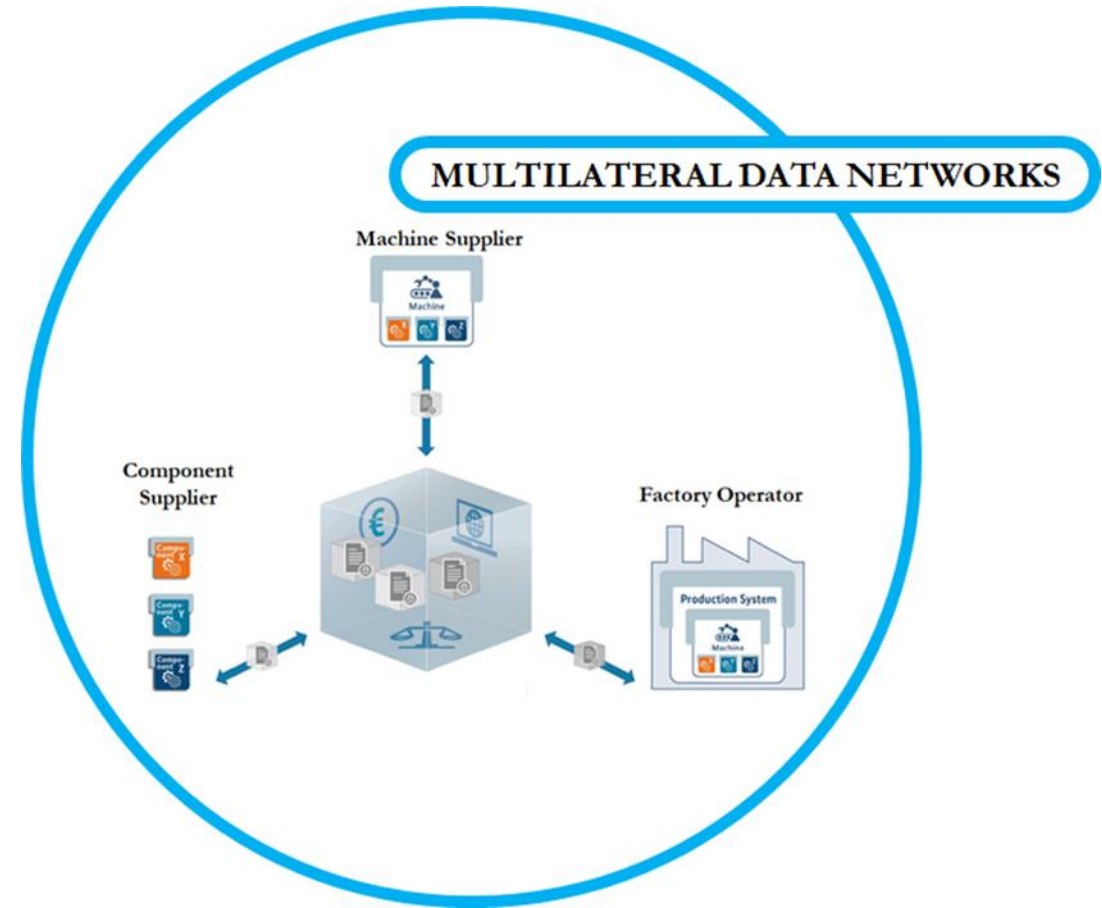


One Data ●
One Use

GLOBAL MANUFACTURING NETWORK EVOLUTION



MULTILATERAL DATA CHAINS



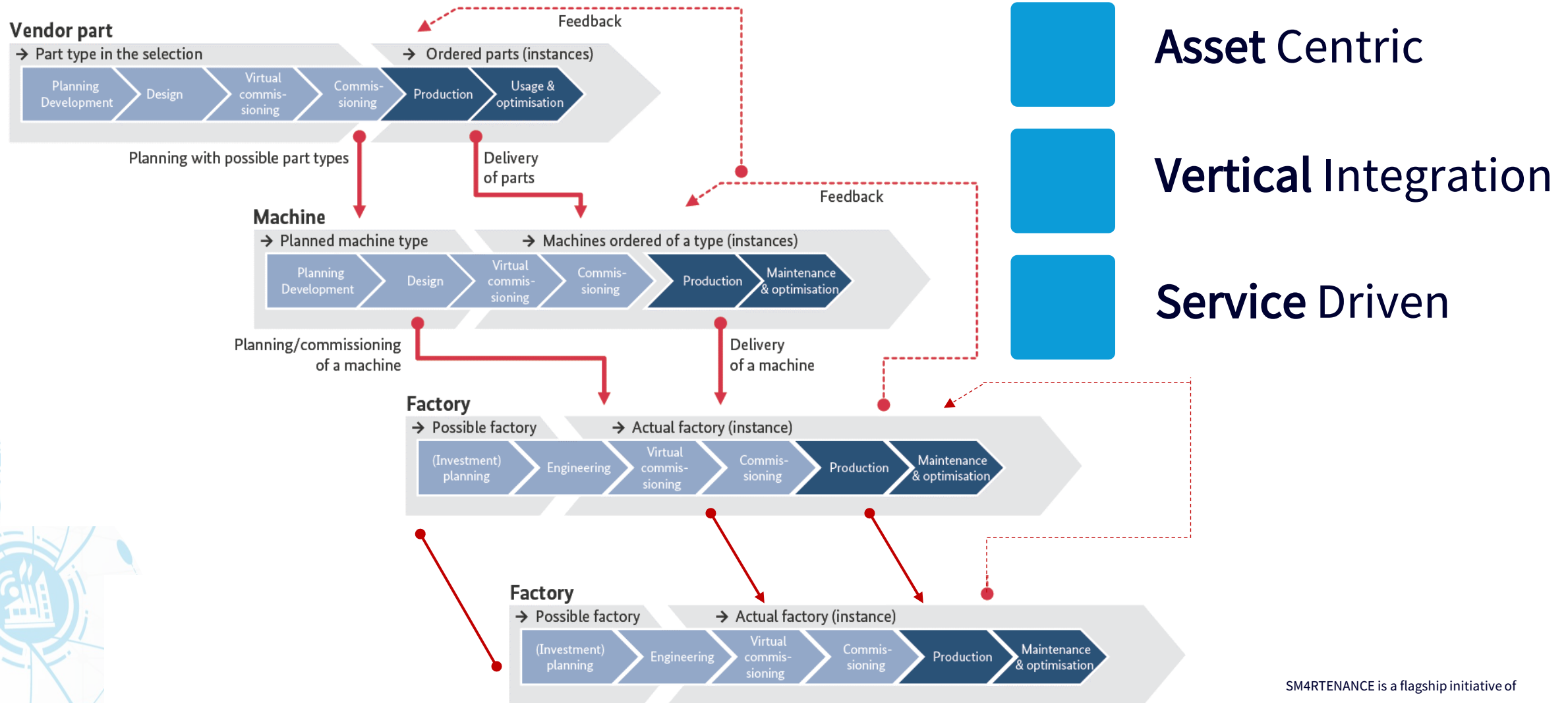
MULTILATERAL DATA NETWORKS

One Partner •
One Project

SM4RTENANCE

SM4RTENANCE DATA SPACE VISION

SM4RTENANCE



SM4RTENANCE is a flagship initiative of

A hand is pointing towards a glowing, circular graphic that features the text "360°" and a circular arrow icon. The graphic is surrounded by concentric, glowing rings and is set against a dark background with blurred city lights and bokeh effects. The overall aesthetic is futuristic and high-tech.

360°

**360° Data
Integration**



From

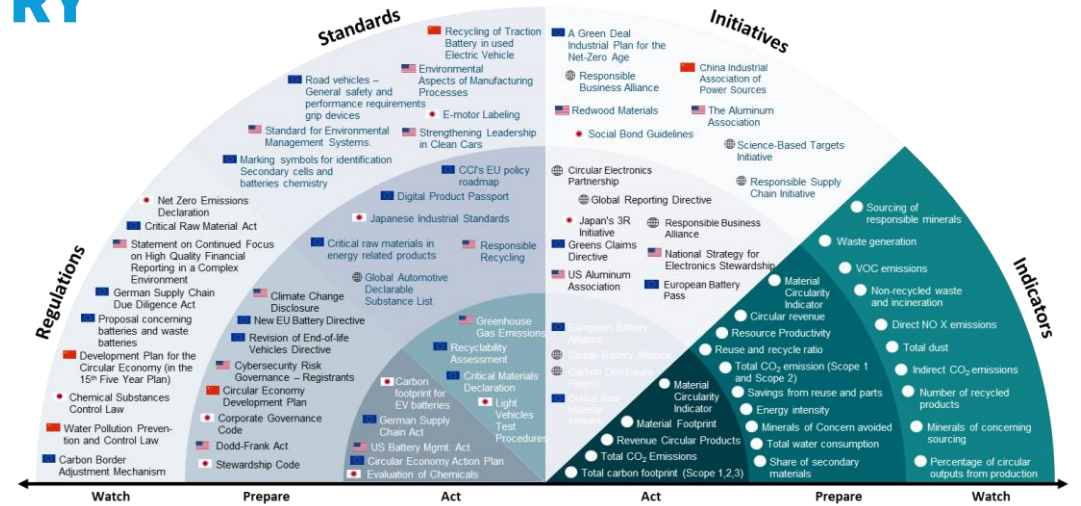
Ecosystem

To

Ecosystems

MANUFACTURING DATA ECOSYSTEMS NEED TO MOVE FASTER AS AN INDUSTRY

- Look for **Quick Wins**
- Drive the Process of Business **Benefits**
- Meet **Regulatory** Challenges
- Set economies of scale on **Core** Principles



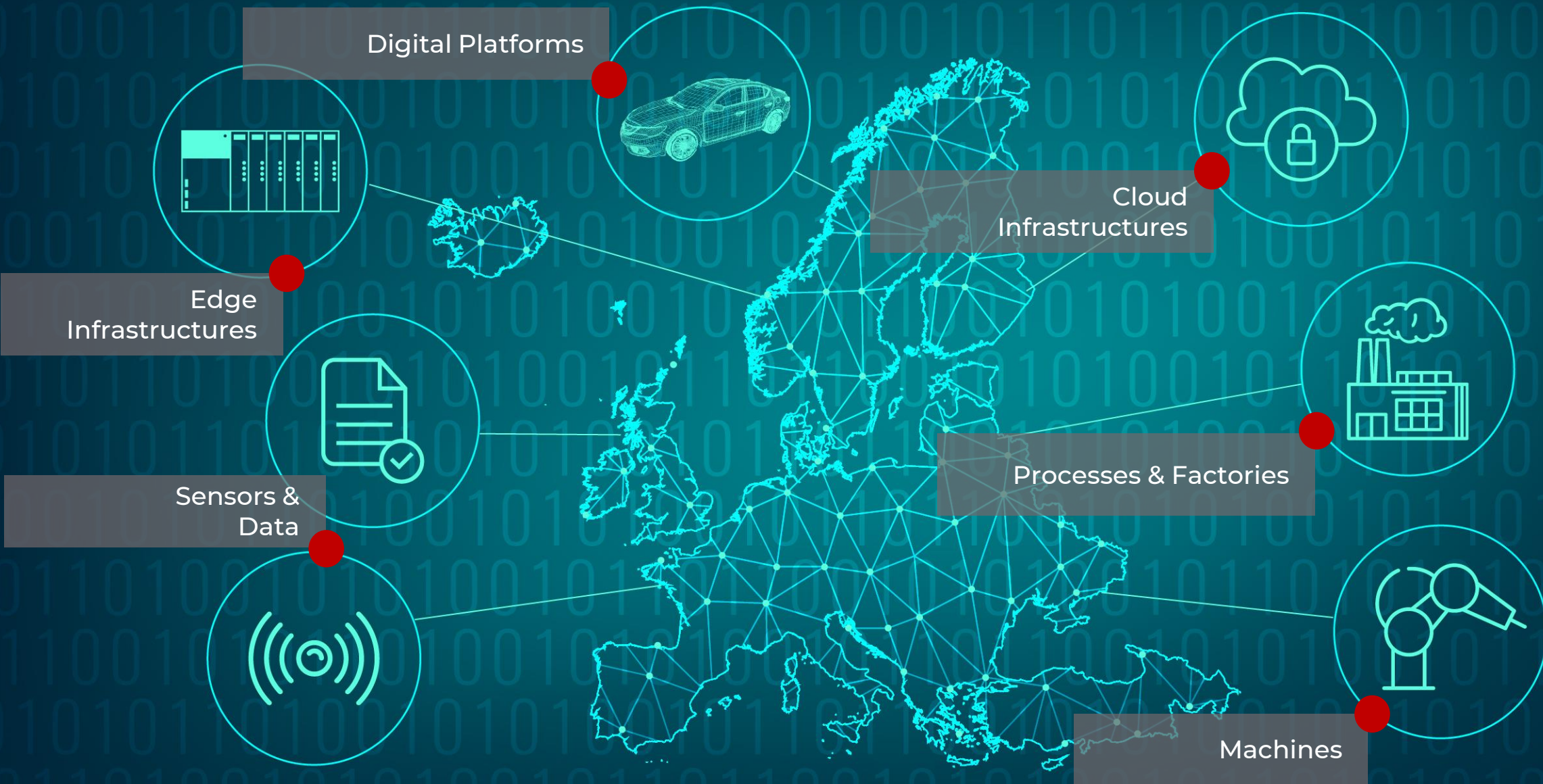
DATA SPACE 4.0 STRENGTHS

- Reduce Interfaces
- Exploit Data **Standards**
- Ensure **Interoperability**
- Data **Sovereignty**
- Data **Security**



DATA MOVES AT
THE SPEED OF TRUST

European Industrial Data Space



OBJECTIVES

DATA SPACE ECOSYSTEM
Increase data sharing across manufacturing companies and service providers.

DATA CHAIN TRUST FRAMEWORK
Establish industrial agreements and governance for global data sharing.

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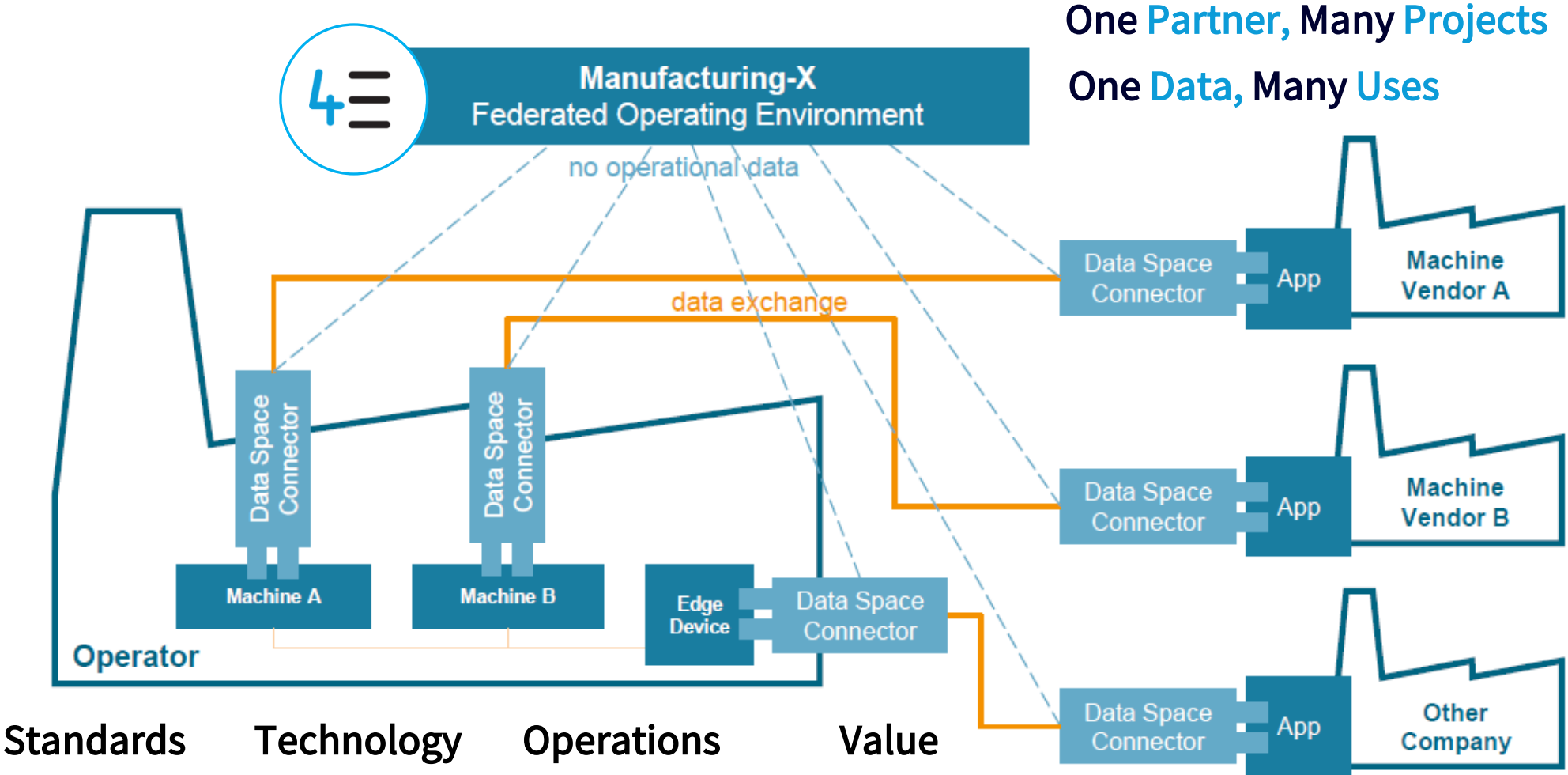
DATA SPACE 4.0 FEDERATION
Deploy operational data space federation for manufacturing assets.

DATA SPACE INFRASTRUCTURE SERVICES PORTAL
Implement services portal for manufacturing asset data sharing interoperability.

COLLABORATIVE OPERATIONS
Facilitate the development of autonomous services for manufacturing assets.

SM4RTENANCE

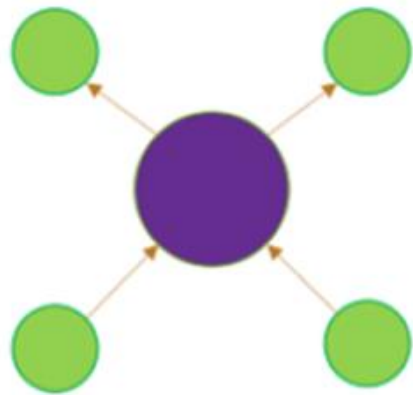
GLOBAL MANUFACTURING DATA ECOSYSTEMS



One Partner, Many Projects
One Data, Many Uses

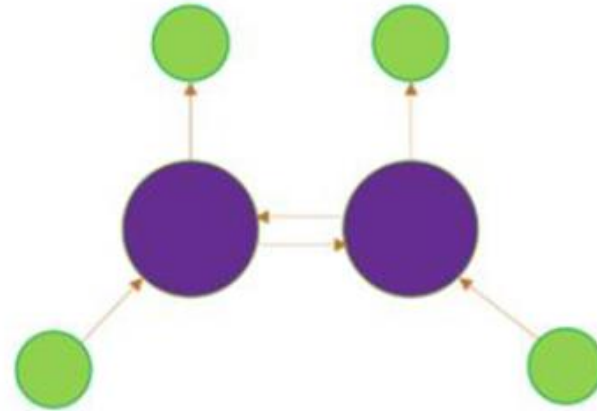
GLOBAL MANUFACTURING DATA ECOSYSTEMS

Today

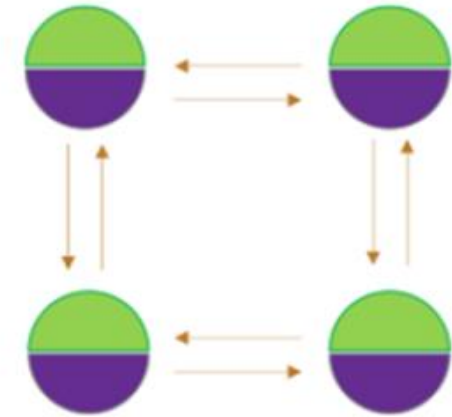


Centralized Data Space Authority

2026



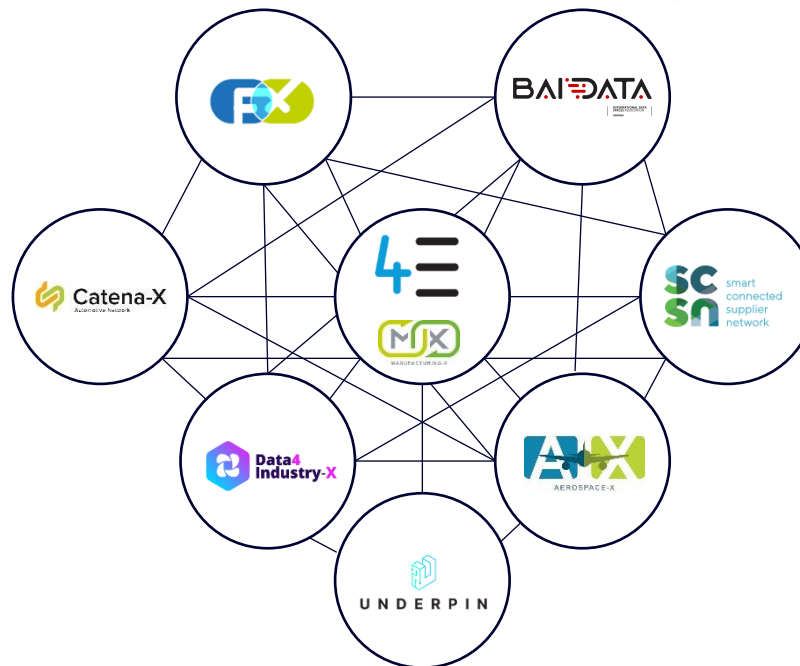
Federated/Distributed Data Space Authority



Decentralized Data Space Authority



Embryonic



- Blueprint
- Standards
- SW Stack
- O&M

360° DATA INTEGRATION

DATA SPACE FEDERATION

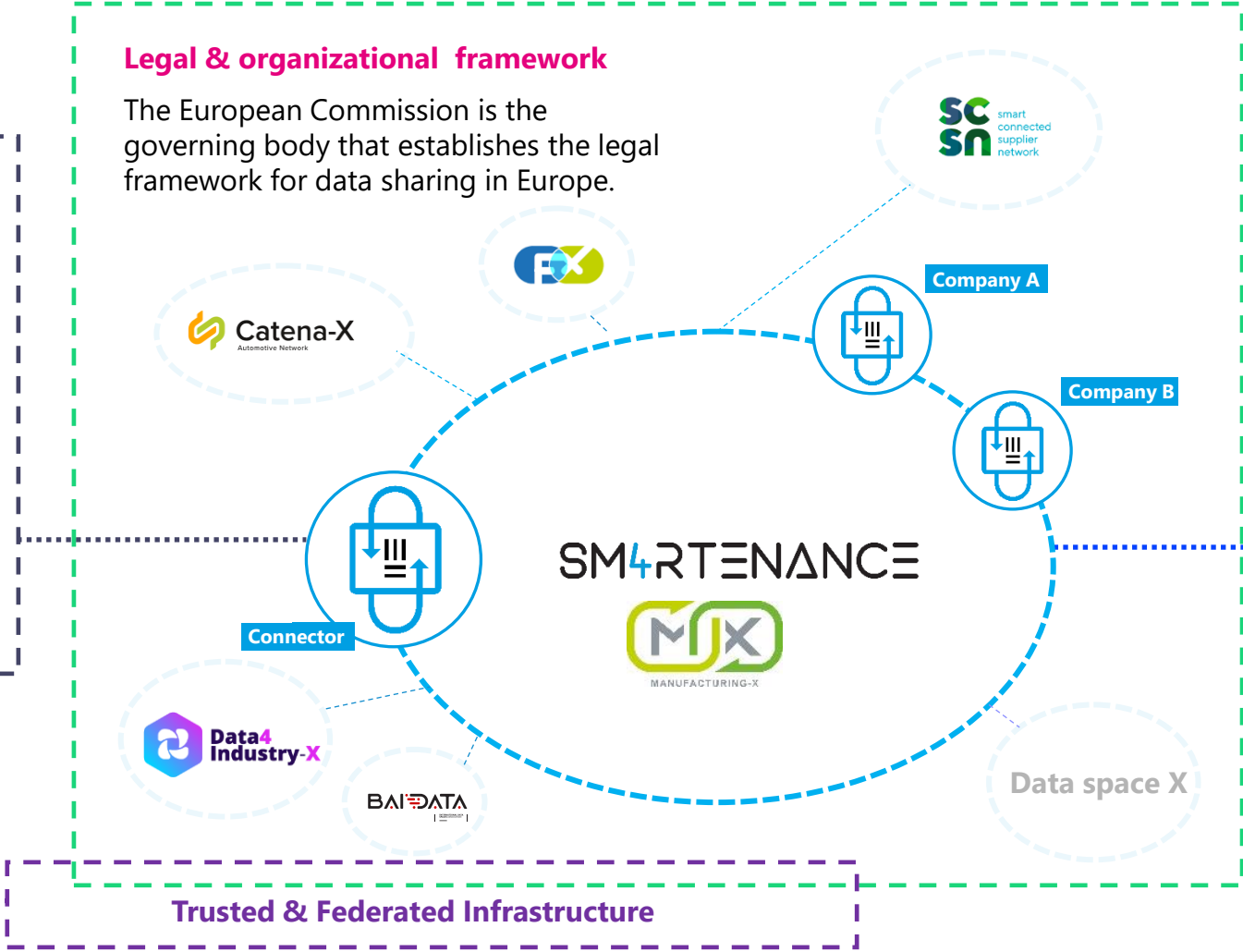
IDS provides a **reference & certification framework** to support sovereign data sharing based on diverse policies & agreements.

The **Data Space Connector** connects participants with the data space.

The connector understands the data space policies and shares data according to these policies.

Legal & organizational framework

The European Commission is the governing body that establishes the legal framework for data sharing in Europe.



Data Space Protocol

Sm4rtenance **builds and sets the federation & interoperation policies of the data space federation.**

It provides a set of lightweight **data space services**, defining the organizational rules and policies for this specific asset 4.0 network federation.



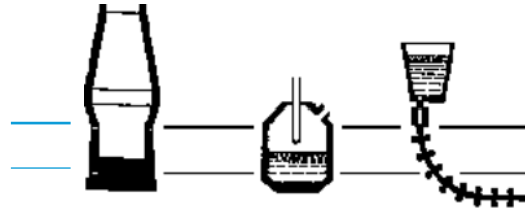


Collaborative Business Applications

DATA VALUE



Iron ore



Iron /steel making



Value in an application

Raw data



Data processing in a context



Value created in an application

Status of a machine
In a production line



Calculate time of use and wear

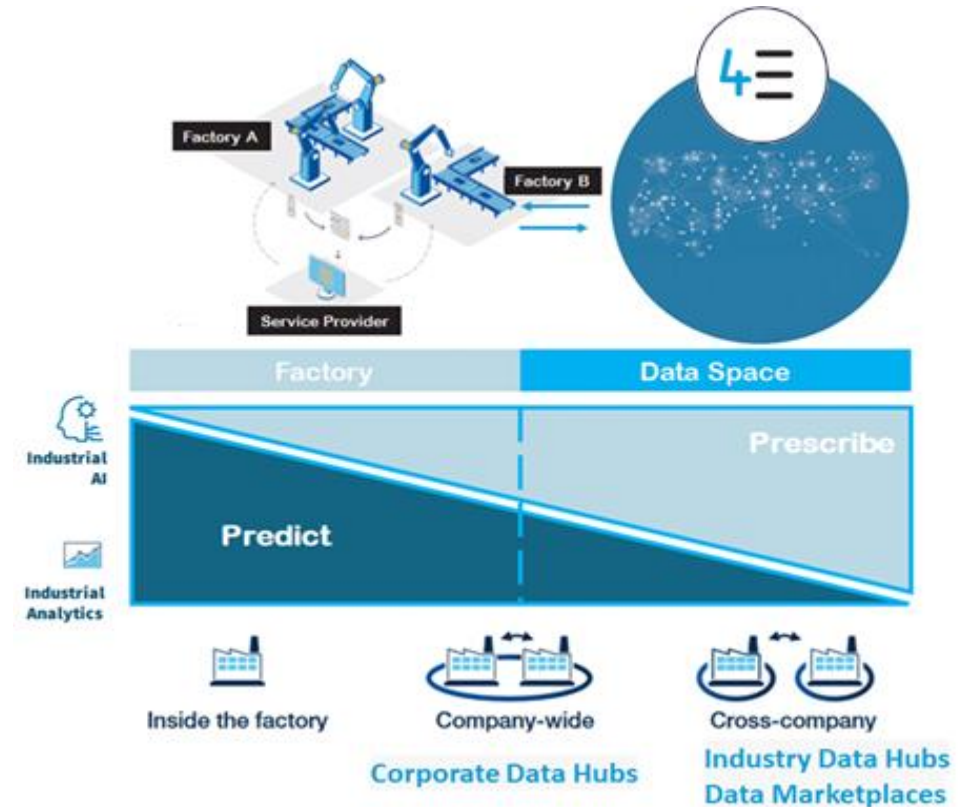
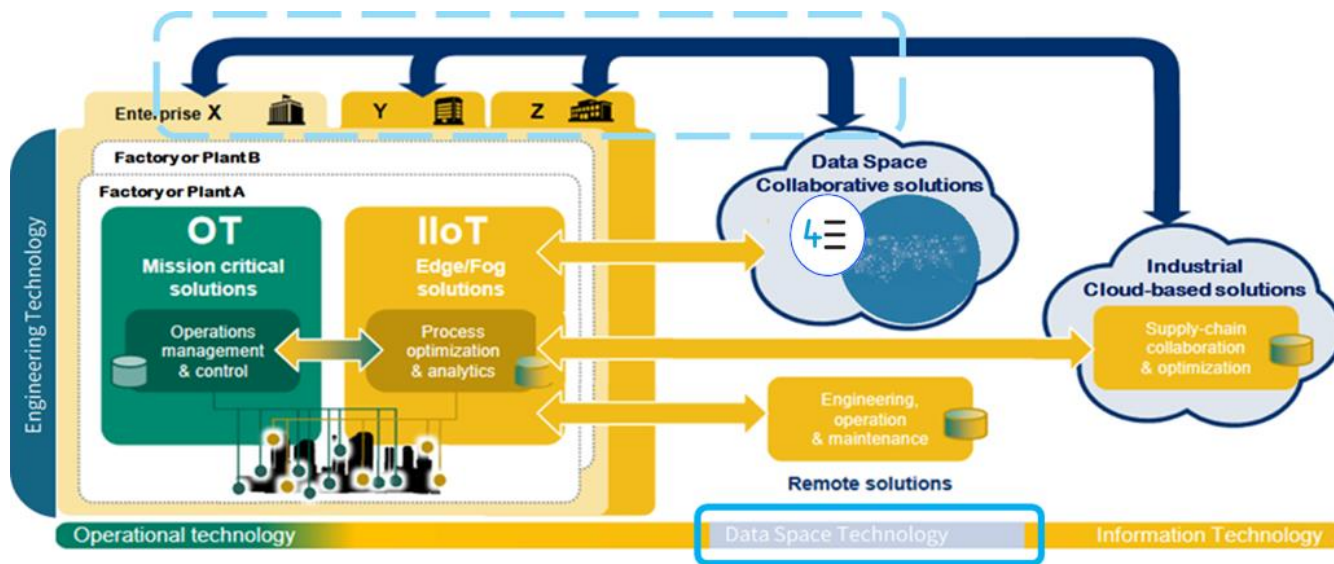


Optimize need for maintenance

The value is generated through putting the data in a context and in a (collaborative) application

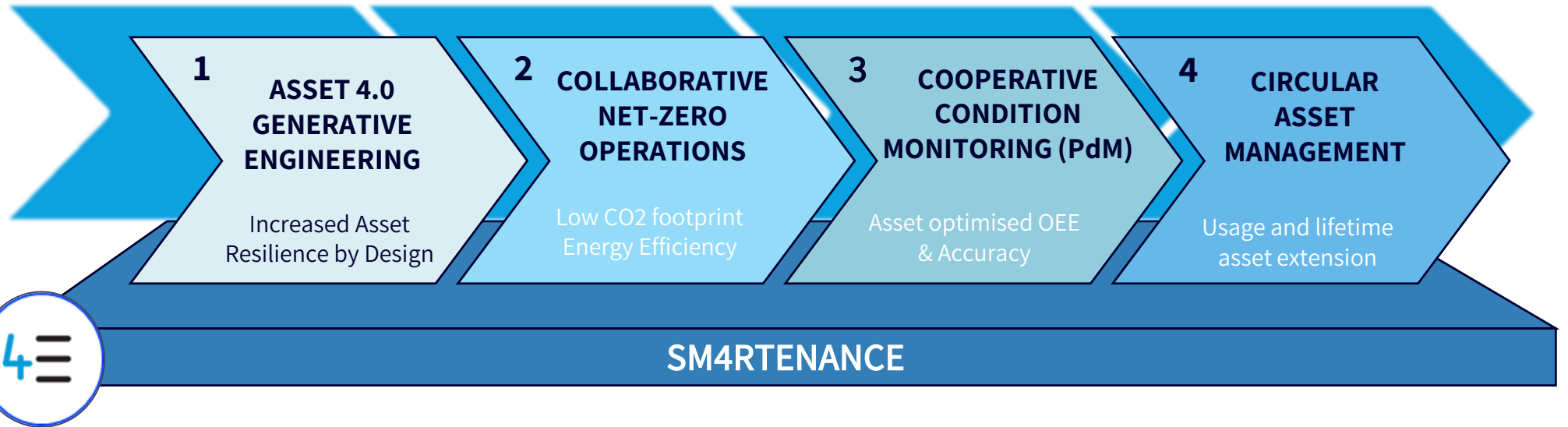
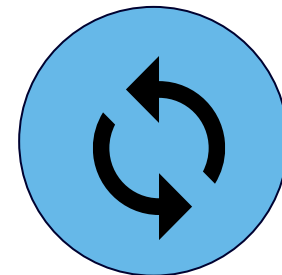
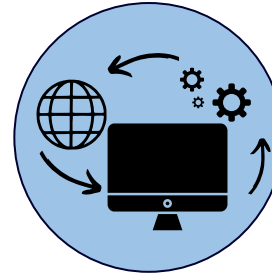
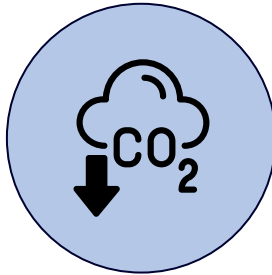
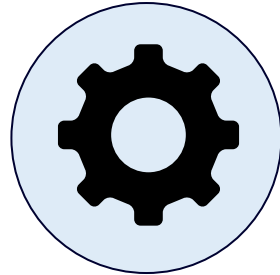
DATA VALUE: AUGMENTED OPERATIONAL CAPABILITIES

- Data Ecosystems & Data Spaces become an integral part of the company digital transformation strategy
- Naturally exploit digital legacy.
- Enable multiple forms of data networks



BUSINESS APPLICATIONS

4C Controlled
Coordinated
Collaborative
Cooperative

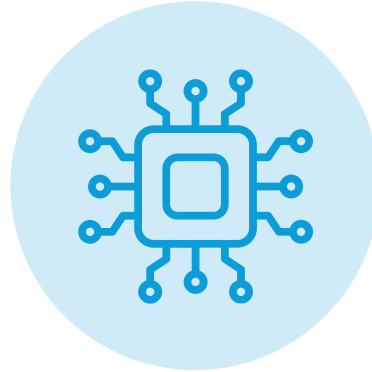


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PILOT BUSINESS APPLICATIONS IN DIVERSE INDUSTRIES



Machine tool & automation



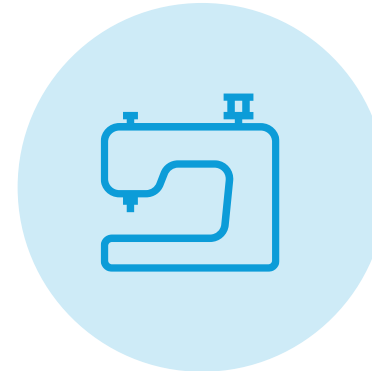
Electronics /e-battery



Automotive



Process



Textile

PILOT BUSINESS APPLICATIONS



ASSET 4.0 GENERATIVE ENGINEERING.

Collaborative connected product/production ecosystem to support engineering and virtual commissioning (digital twin) aiming for resilience and autonomous production.

Zero defect, zero accident, zero errors, zero time to market.



COLLABORATIVE NET-ZERO OPERATIONS.

Collaborative services focused on improving machine tool operations, reducing scrap, energy consumption, manufacturing errors and optimal use of manufacturing asset consumables.

Zero defect manufacturing, zero raw material use, zero net energy.



COOPERATIVE CONDITION MONITORING (PdM).

Collect data, predict health status, and plan maintenance operations and consequently reduce operations costs, improve safety, and avoid environmental harm and human casualties.

Zero stocks, zero break downs, zero supply network breaks, zero reconfiguration time.



CIRCULAR ASSET MANAGEMENT.

Development of regenerative asset systems aiming to increase resilience, reduce global supply chain reliance, and foster strategic, local, and regional capabilities while meeting sustainability targets and 9R processes.

Zero waste.



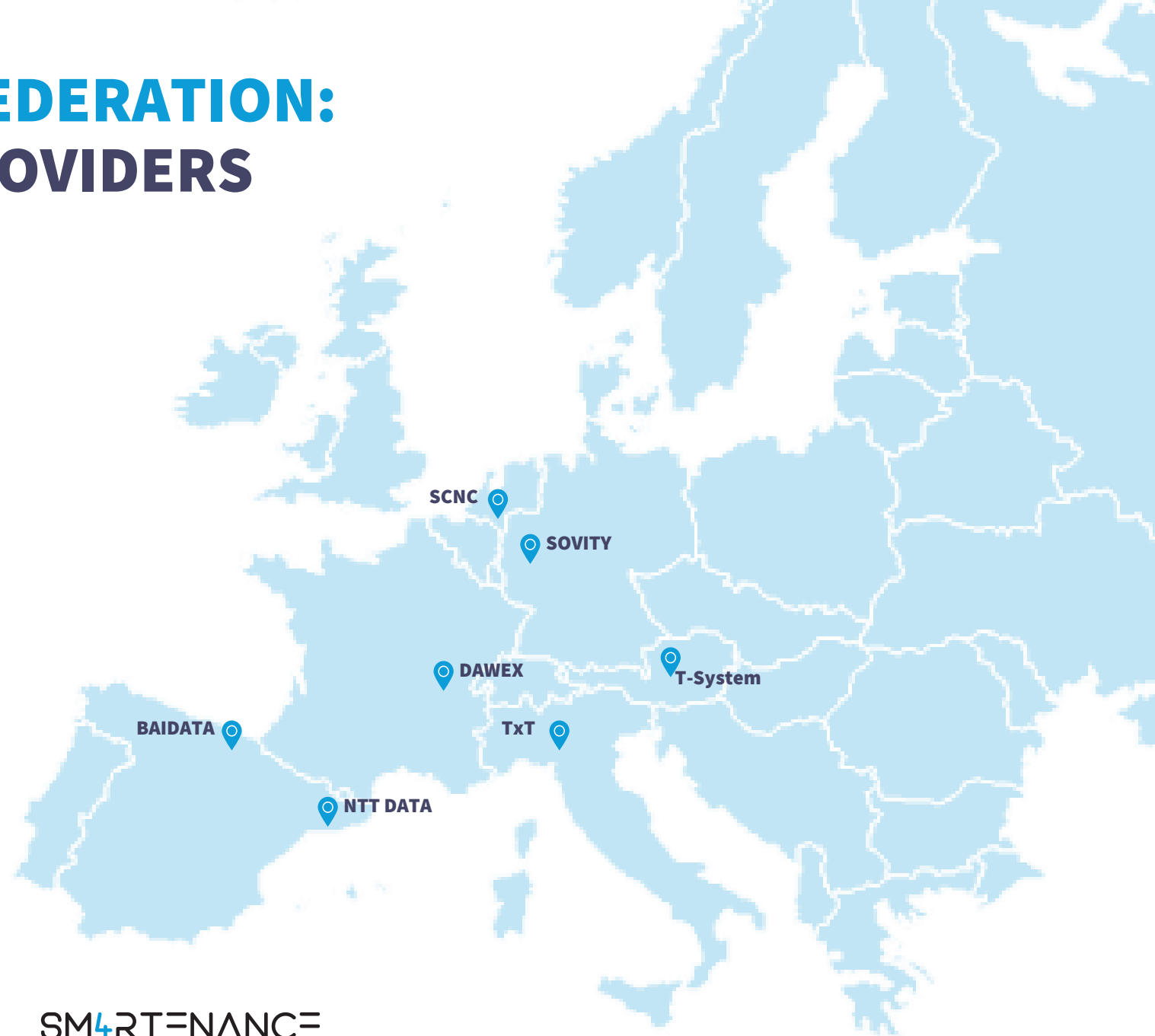
DATA SPACE FEDERATION: SERVICE PROVIDERS



Federated data sharing space striving for interoperability for manufacturing equipment industry.



- Data Exchange Platforms
- Data Space as a Service
- Managed Data Space Services
-



SM4RTENANCE

Trusted Data Sharing for Manufacturing Equipment Industry

Thank you!



sm4rtenance.eu



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info@sm4rtenance.eu



Partners



ASSOCIATED PARTNERS



INTERNATIONAL DATA SPACES ASSOCIATION



SIEMENS

