PLIADES

# "AI-Enabled Data Lifecycles Optimization & Data Spaces Integration for Increased Efficiency & Interoperability"

This project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No. 101135988

# PLIADES – Mission

**Develop an Advanced AI-enabled Data Integration Framework**

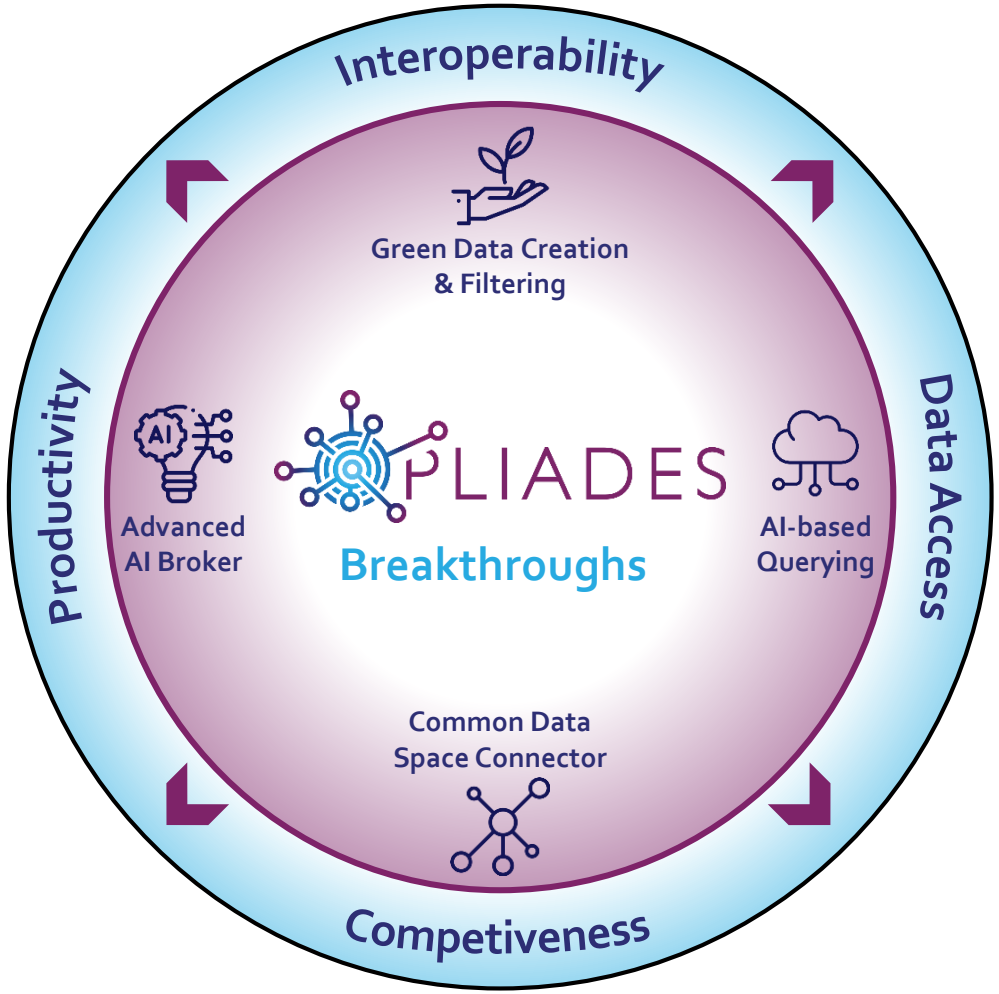
**Enhancing Lifecycle Optimisation & Data Spaces Integration to:**

**Interconnect Diverse Data Spaces**
→ Enhancing Efficiency & Interoperability

**Expand Data Lifecycles**
→ Supporting Green Data Creation, Ownership, Reuse & Disposal

**Enable AI-driven Brokers**
→ Facilitating Data Discovery & Integration

**Provide Data & Services**
→ Improving *CCAM[1] & ADAS/AD[2] & HRI[3]*




*1. Cooperative, Connected & Automated Mobility, 2. Advanced Driver Assistance & Autonomous Driving, 3. Human-Robot Interaction*

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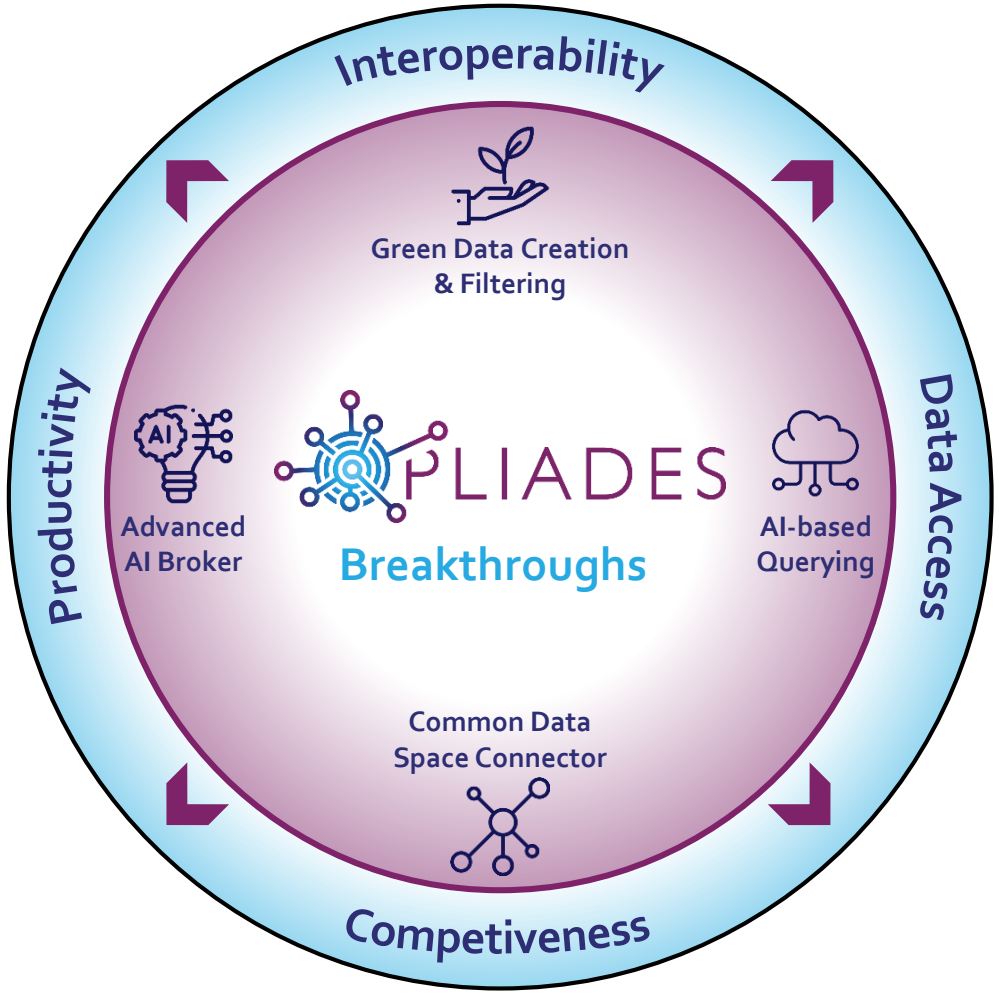


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# The users and their expectations for PLIADES

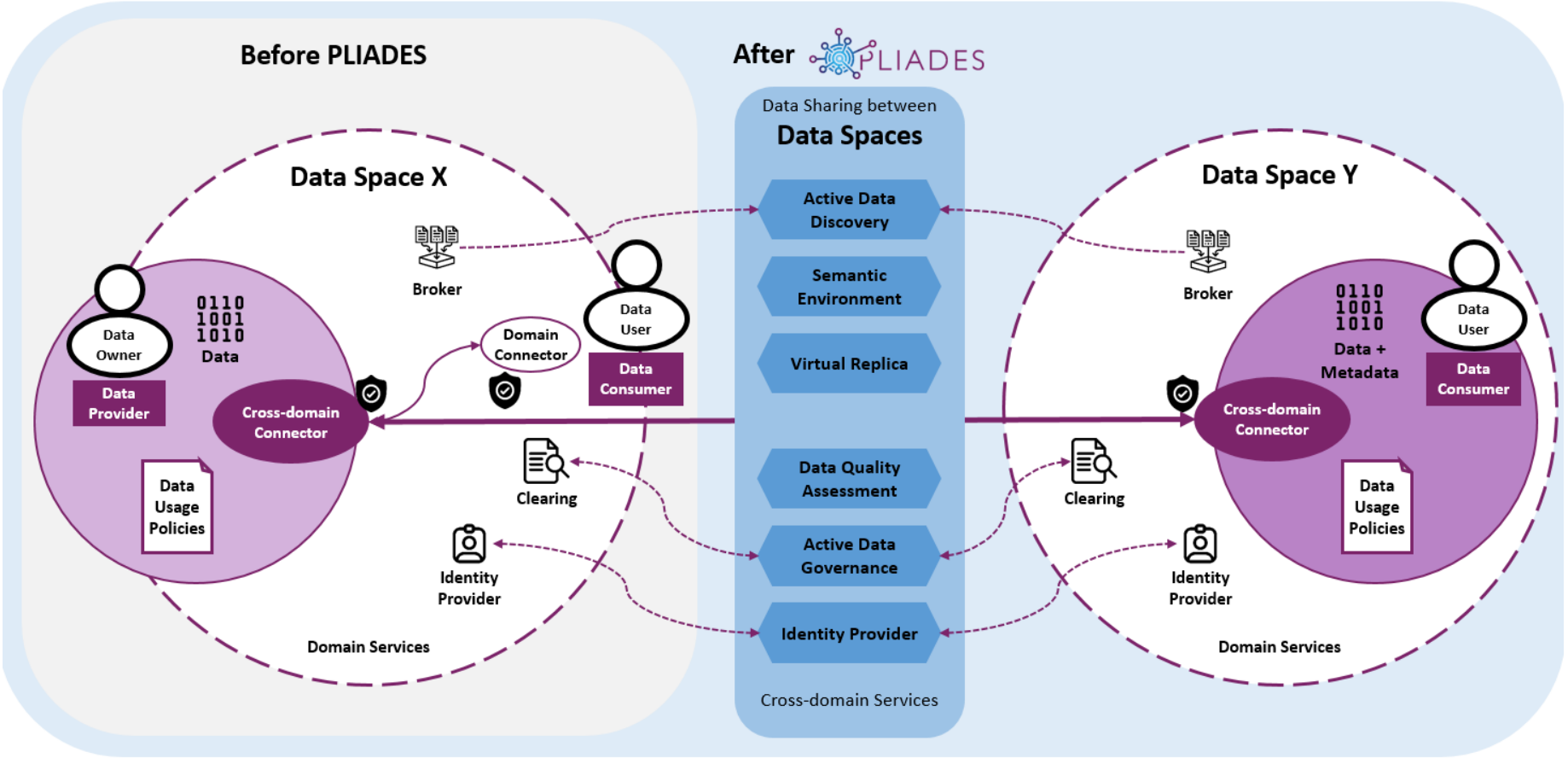
| Users | Needs: | Expectations for PLIADES: |
|---|---|---|
| Data Engineers, Data Scientists, AI Developers | Tools to design and manage AI pipelines | Explainable and trustworthy AI integrated into workflows |
| IT Departments, System Integrators | Integration with legacy systems and heterogeneous data sources | Interoperability with European Data Spaces and standards (e.g., DSSC, IDSA) |
| Researchers, Domain Experts, Engineers | Semantic enrichment and annotation of industrial data | Interoperability with European Data Spaces and standards (e.g., DSSC, IDSA) |
| Technical Managers, R&D Leads | Validation of AI outputs with human expertise (human-in-the-loop) | Simplified access to diverse and distributed data |
| | Automation across the data lifecycle (discovery, processing, sharing) | Simplified access to diverse and distributed data |
| | Secure and compliant data sharing across domains | Enhanced collaboration across departments, domains, and organizations |
| | Cross-domain discoverability and reuse of data assets | Support for data sovereignty, compliance, and value creation |

# PLIADES – Approach

PLIADES establishes a secure & seamless **Data Exchange Ecosystem** by integrating **Diverse Data Spaces**

## Key components

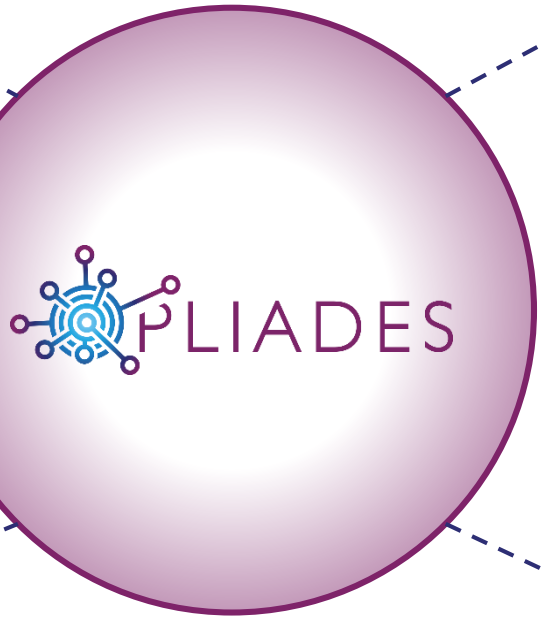
- Data Discovery & Governance
- Secure Data Exchange
- Cross-Domain Integration



# PLIADES – Objectives

Novel **AI-enabled Tools** for **Sustainable** & **Human-factors-aware Data Creation** in **Diverse Dataspaces**

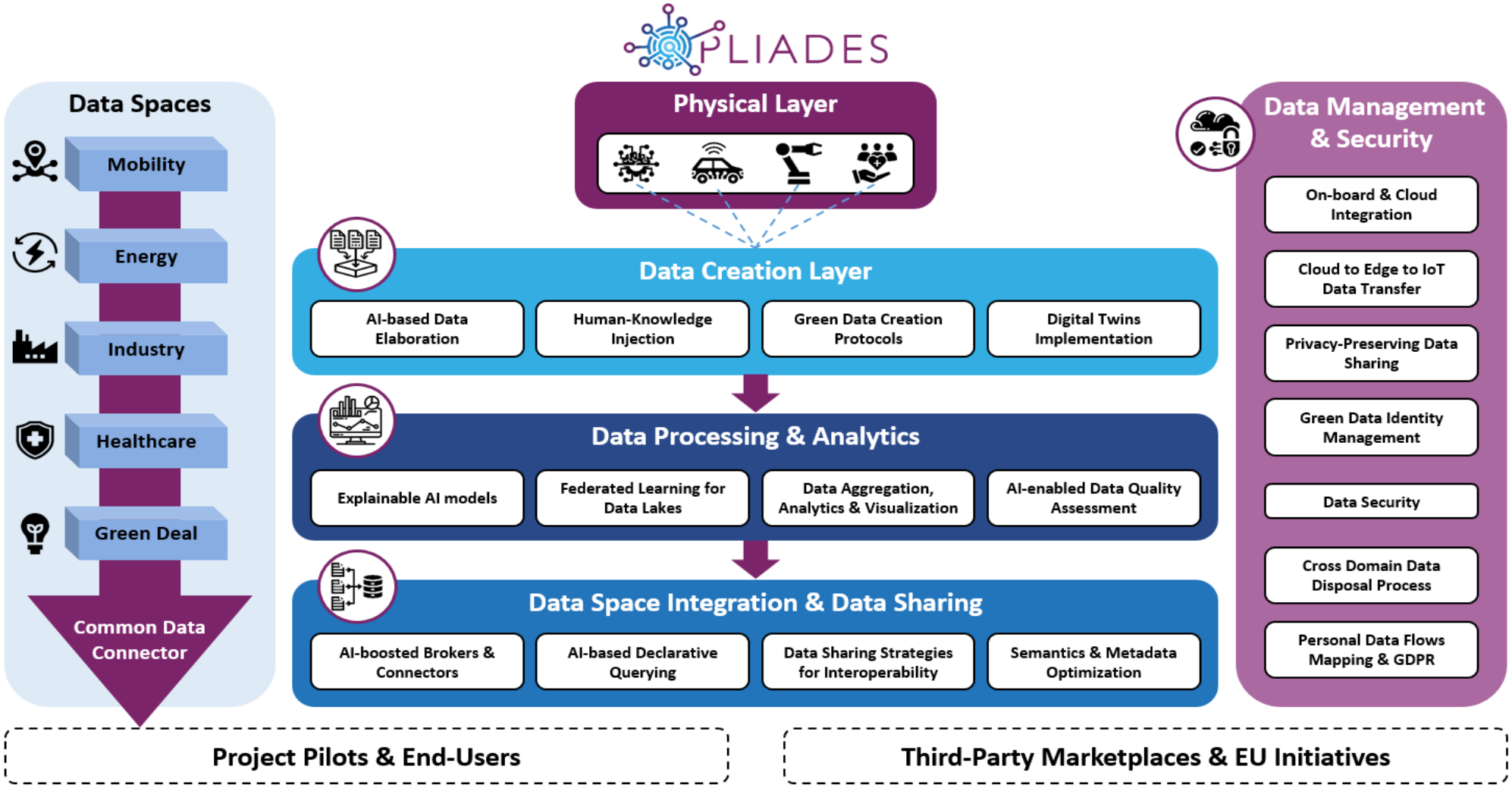
Advanced **Data Spaces Connectors** for Extended **Interoperability** across Different Data Spaces




Novel **AI-boosted Data Brokers** Matching **Data Consumers** with **Data Providers** across **Different Sectors**

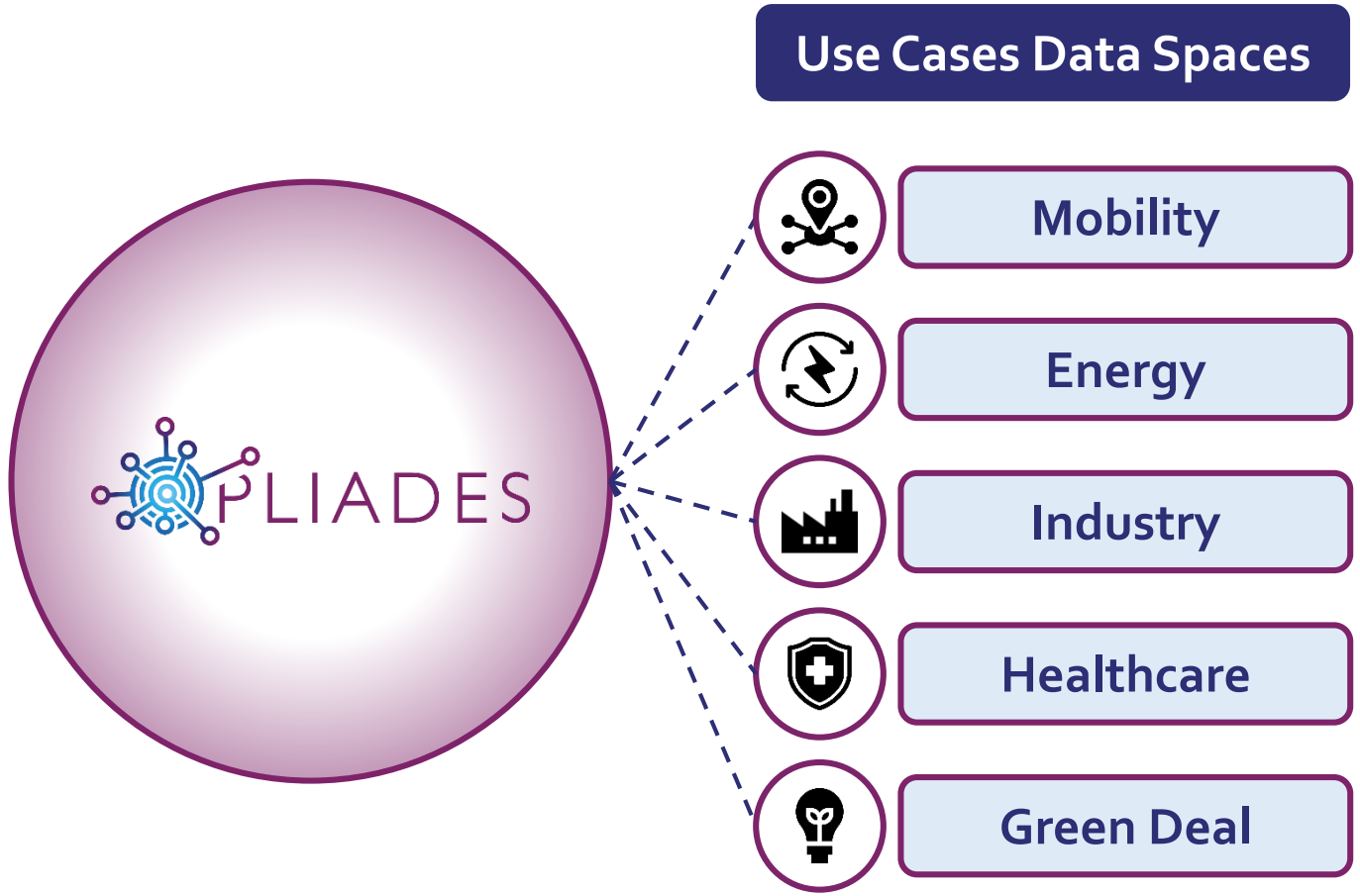
Novel **Data Processing & Analytics** Services, Ensuring **Data Privacy**, **Trustworthiness**, **Security**, **Re-use**, & **Disposal**

# PLIADES – Concept Overview



# PLIADES – Use Cases

**PLIADES Outcomes** will be Evaluated in **Six Use Cases**, **Focusing** on **Key AI & Robotics Technologies**, oriented around **Five Diverse Data Spaces**



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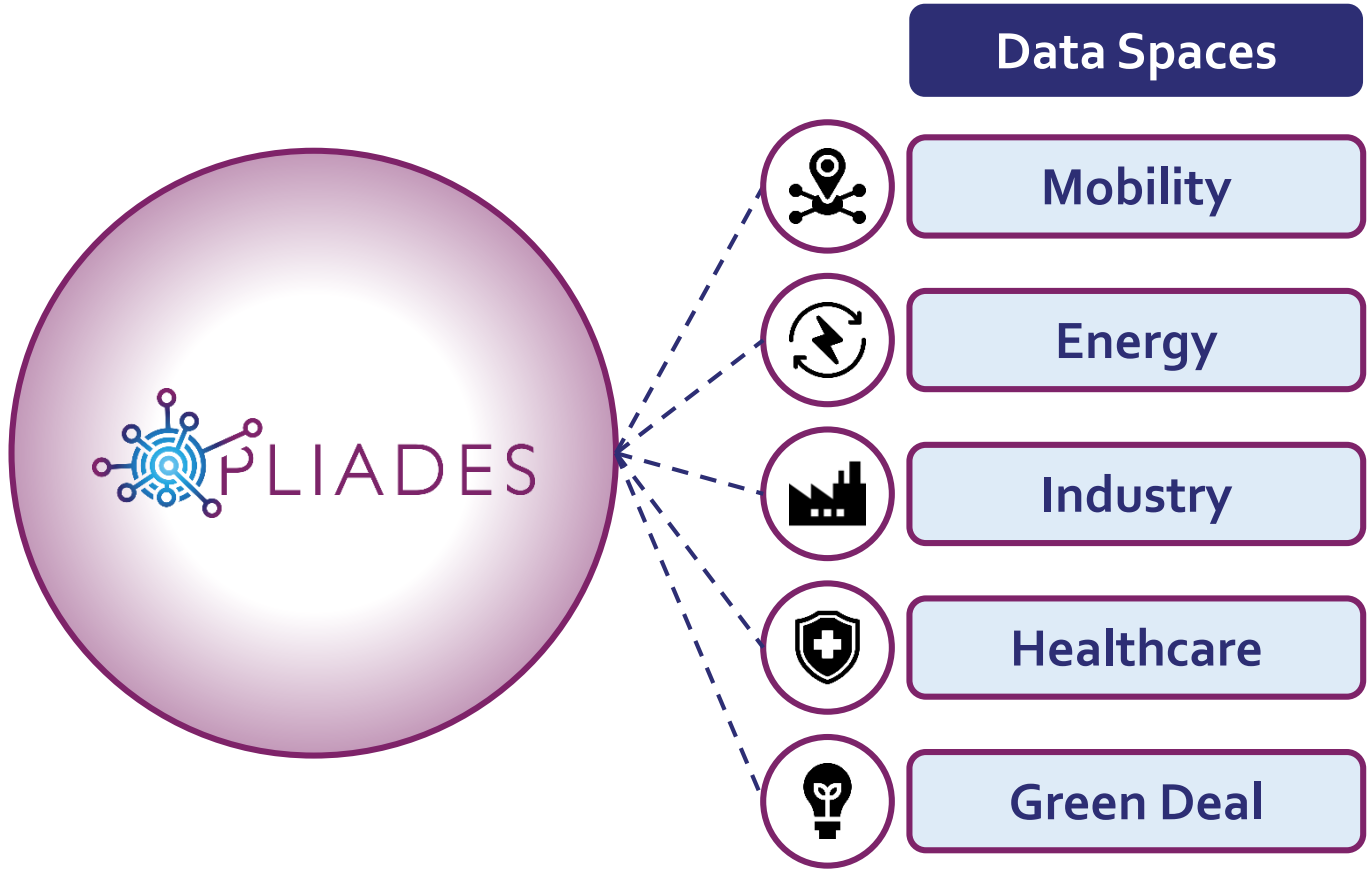

# Use Case 1 – Industrial Data Space

**UC1. Integrating Data Life Cycles of Sustainability, Operations & Process Industry Manufacturing Operations**

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Industry

**Impact for AI & Robotics in Industrial Manufacturing:**

- AI-powered Smart Manufacturing with Zero-Waste Production
- Predictive Maintenance & AI-based Process Optimization
- Human-in-the-Loop AI for Reliable & Efficient Industrial Automation
- Secure & Scalable AI-Driven Industrial Data Sharing

# Use Case 2 – Healthcare Data Space

**UC2. Integrating Data Life Cycles of Service Robot to Improve HRI with End Users**

- HRI in Rehabilitation
- HRI in Patient Monitoring

Current Robots from CERTH Performing Human Action Recognition & Receptionist Tasks

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**Healthcare**

**Impact for AI & Robotics in Healthcare:**

- Human-Centric AI for Personalized Robotic Assistance
- Secure, Scalable Data Spaces for AI-Driven HRI Training
- Improved Robot Autonomy & Adaptability in Healthcare
- Privacy-Preserving AI Development for Ethical & Reliable Robotics

# Use Case 3 – Healthcare Data Space

**UC3. Integrating Data Life Cycles of Personalized Medicine Services to Improve Diagnostic & Prognostic Clinical Prediction Models**

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**Healthcare**

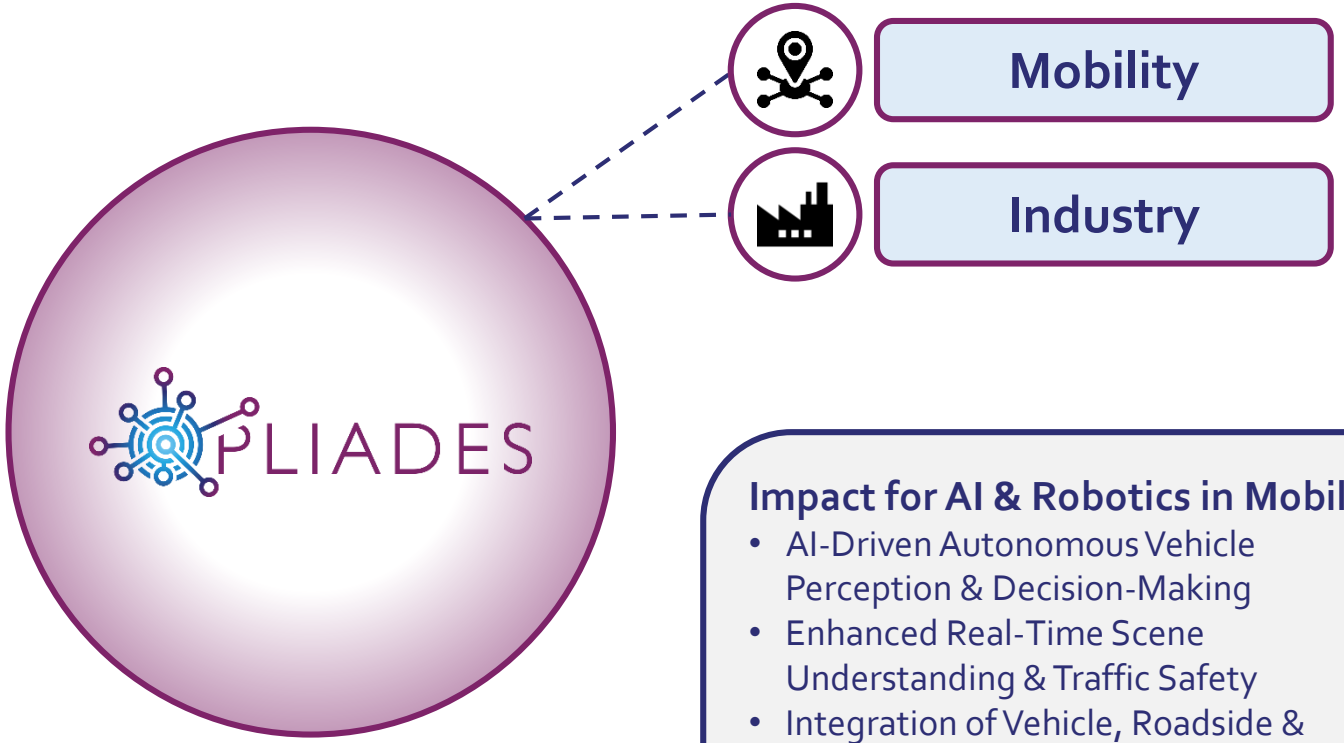
**Impact for AI & Robotics in Healthcare:**

- AI-powered Personalized Medicine & Precision Healthcare
- Predictive AI Models for Early Disease Detection & Risk Assessment
- Advanced Machine Learning for Personalized Treatment Recommendations

# Use Case 4 – Mobility & Industrial Data Spaces

**UC4. Integrating Data Life Cycles of Smart Vehicles for CCAM Operations & ADAS/AD Functions**

- AI-based ADAS Development
- AI-based Traffic Management

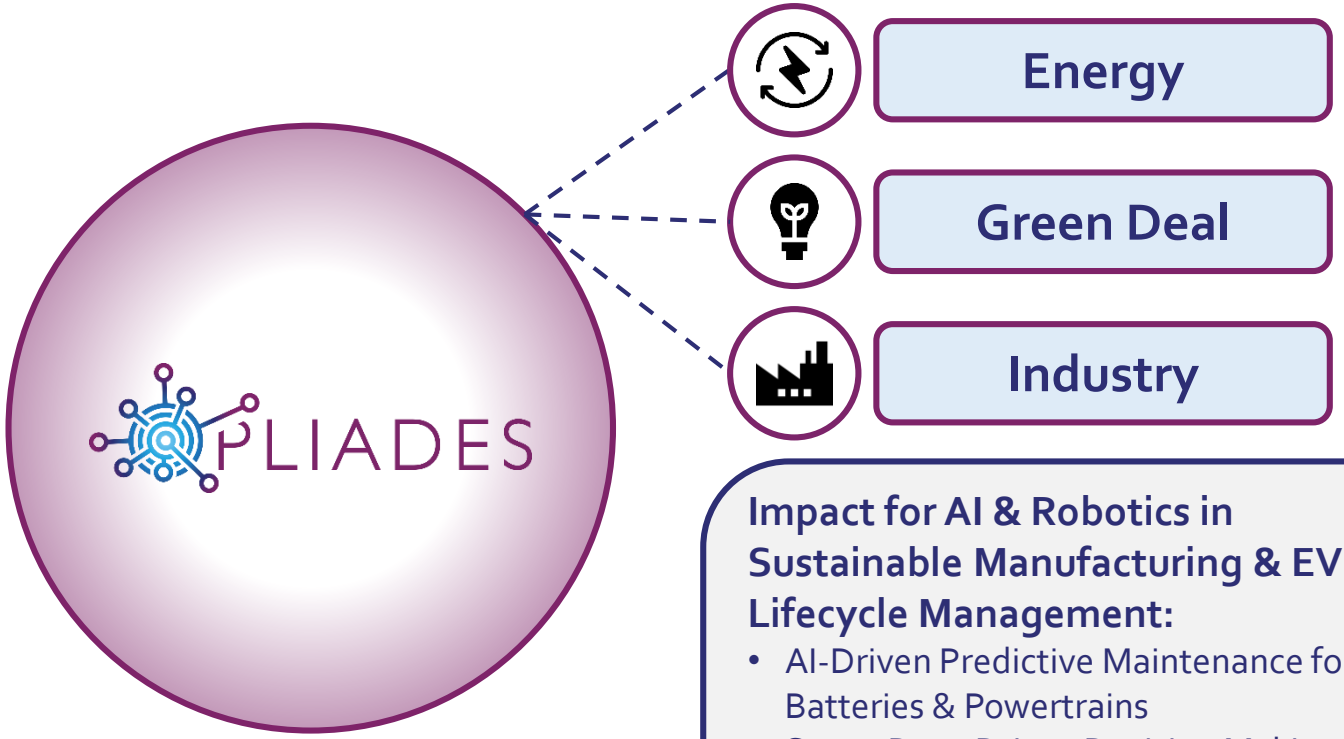

**Impact for AI & Robotics in Mobility:**

- AI-Driven Autonomous Vehicle Perception & Decision-Making
- Enhanced Real-Time Scene Understanding & Traffic Safety
- Integration of Vehicle, Roadside & Floating Vehicle Data for AI Training
- Human-AI Collaboration for Data Labeling & Autonomous Driving Optimization

# Use Case 5 – Energy, Green Deal & Industrial Data Spaces

**UC5. Integrating Data Life Cycles of WEEE1/Batteries Management & Car Parts Manufacturing Operations**


*1 Waste Electrical &Electronic Equipment*



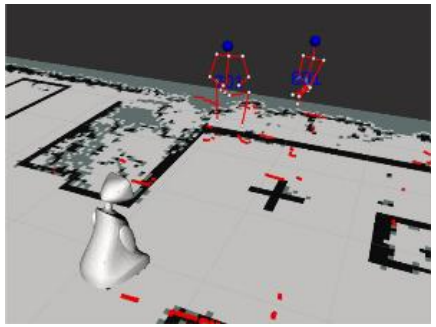

**Impact for AI & Robotics in Sustainable Manufacturing & EV Lifecycle Management:**

- AI-Driven Predictive Maintenance for EV Batteries & Powertrains
- Smart Data-Driven Decision Making for Sustainable Manufacturing & Recycling
- Trustworthy AI & Explainable ML for Green Deal-Compliant Industrial Processes

# Use Case 6 – Healthcare & Industrial Data Spaces

**UC6. Integrating Professional Service Robot Data Life Cycles to Improve HRI with Robot Operators**

- HRI in telepresence robot operation
- HRI in rehabilitation robot operation
- HRI in manufacturing inspection robot operation



Robots from CERTH performing Human Action Recognition & Inspection Tasks

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**Healthcare**

**Impact for AI & Robotics in Healthcare:**

- AI-powered HRI Enhancement through Multimodal Data Fusion (Speech, Gestures, and Commands)
- Adaptive Robotic Systems for Healthcare Environments with Personalized Interaction.
- Secure and Scalable AI-driven Data Spaces for Continuous Robot Learning and Human-robot Collaboration.

# Consortium


## PLIADES Consortium

- 28 Partners
- 10 EU Member States & Switzerland

## Consortium Breakdown

- 13 RTOs
- 10 SMEs
- 5 NPOs

# Thank you for your attention!

## Any Questions?

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