Gaia-X Voices:
Use-Case Testimonial

Cross company data exchange along the value chain for sustainable production

AMIDS *(Austrian Manufacturing Innovation Data Space)*

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1. Introduction

a. *Brief overview of organisation and Industry*

AMIDS (Austrian Manufacturing Innovation Data Space) is a national, multi-stakeholder initiative that implements a European manufacturing data space adhering to Gaia-X standards. The programme builds on two backbone R&D projects: PilotLin-X (2022–2027) and ResearchLin-X (2022–2025), that digitally interconnect the three Austrian university pilot factories (TU Wien Pilotfabrik Industrie 4.0 , smartfactory@tugraz, and JKU LIT Factory). AMIDS focuses on demonstrating secure and sovereign B2B data sharing and service discovery for real industrial processes, with an emphasis on SMEs.

The use case discussed here deals with the sustainable product lifecycle management for plastic injection-moulded parts.

AMIDS collaborates closely with the Gaia-X Hub Austria - Domain Manufacturing to align technology choices and governance with evolving Policy Rules Conformity (PRC) guidance.

b. *Main stakeholders and the roles they play in designing the use-case*

Stakeholder	Role
TU Wien Pilotfabrik Industrie 4.0	Lead partner and coordinator; hosts demonstrations and co-design/co-production use case; convenes ecosystem.
smartfactory@tugraz	Pilot factory partner, focuses on agile, data-secure assembly and metal additive manufacturing.
JKU LIT Factory	Pilot factory partner, plastics processing and circularity, leads injection-moulding lifecycle use case.
AMIDS	Operates the membership offer and provides low-threshold access to a Gaia-X test environment, trainings, and a data/service catalogue.
Industry partners (ENGEL, Haidlmair, Siemens, Motan, Westcam)	Provide industrial requirements, testbeds, and process data, validate AAS/DPP implementations in real processes.
IT & infrastructure partners (T-Systems, Exoscale)	Provide digital infrastructure, integration, and services for data exchange, identity and access, and production IT.
EIT Manufacturing East & Plattform Industrie 4.0	Ecosystem building, dissemination, and alignment with Gaia-X Hub Austria – Domain Manufacturing.

2. Context & Challenge

a. *Brief description of the problem that the use-case addresses*

Cross-company data sharing in manufacturing remains difficult. Enterprise and shop-floor data are typically capsuled across Computer aided Design (CAD)/ Computer aided Manufacturing (CAM)/ Product Lifecycle Management (PLM) , simulation, Manufacturing Execution System (MES)/ Supervisory Control and Data Acquisition (SCADA) and quality systems, with limited interoperability, unclear licensing/usage rights and fragmented identities. In plastics injection moulding specifically, know-how in tooling, machine presetting and process optimisation is often not captured in standardised models and therefore cannot be reused across organisational boundaries.

Robotics and mechatronics projects add further complexity: multi-disciplinary engineering data, distributed IP, supplier know-how and safety-critical validation must be coordinated across locations. SMEs, in particular, typically lack the resources to trial data-space technologies or to align with evolving Gaia-X PRC criteria on their own.

Result: slower time-to-first-part, limited traceability/ Product Carbon Footprint (PCF) transparency, difficulty in scaling best practices between production sites, and missed opportunities for AI/analytics that depend on trustworthy, portable data.

3. Solution description

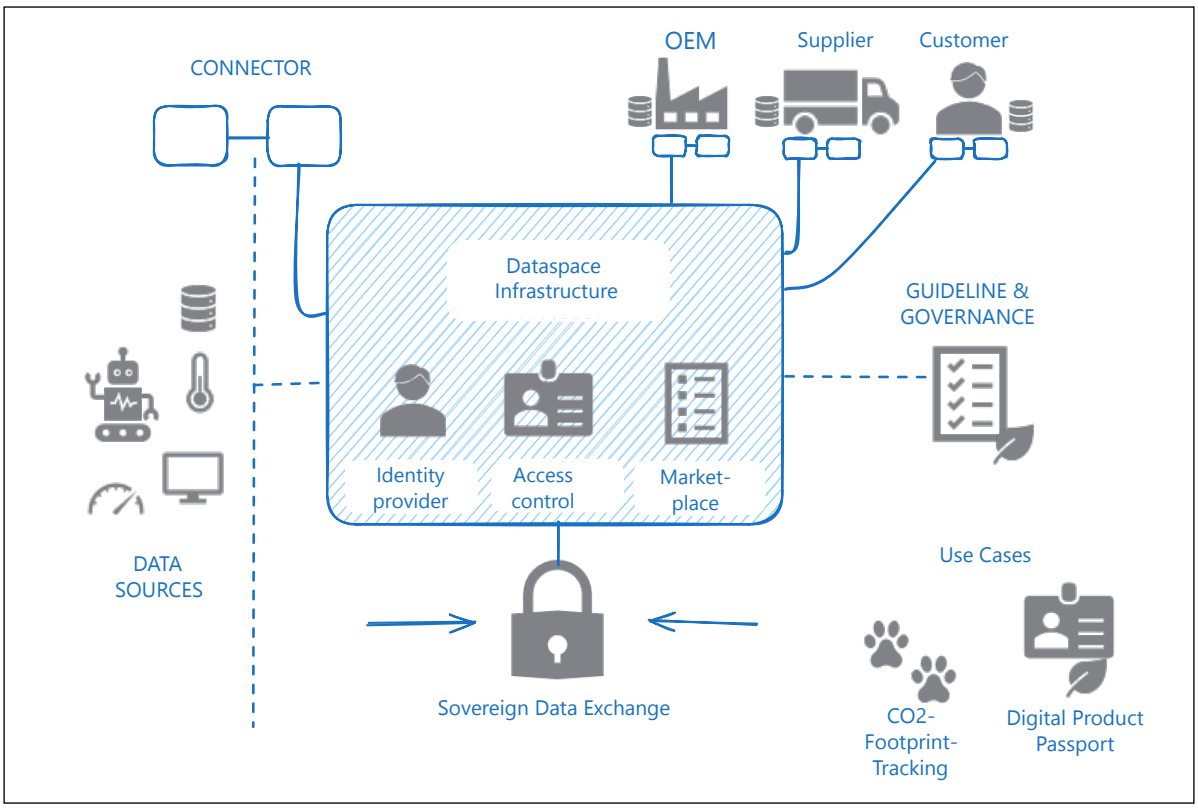
a. *Solution implemented to address the identified challenges*

AMIDS implements a manufacturing data space in alignment with Gaia-X standards that federates participants and services under common technical, organisational and legal rules. Practically, this means:

a. identity and verifiable credentials for participants/services
b. a catalogue for data and services
c. usage control aligned with data-sovereignty principles
d. interoperable interfaces grounded in de-facto industry standards

Sustainable PLM for injection-moulded parts:

The demonstrator integrates design/tooling data, machine pre-setting and process/quality data end-to-end and hands over structured information as an Asset Administration Shell (AAS). A Digital Product Passport (DPP) and complementary Digital Process Passport (DPssP) capture material composition, batch-level PCF and key process indicators. The team explores privacy-preserving techniques (e.g., compute-to-data) to keep sovereignty while enabling audits and reporting.



b. *Role of technology in the development and deployment of the solution*

- **Gaia-X foundations**: adherence to PRC labelling concepts (e.g., Gaia-X Standard Compliance) and alignment with the Gaia-X Hub Austria - Domain Manufacturing guidance; federation rather than centralisation.
- **Identity & trust**: organisation and service identities backed by verifiable credentials; participation under transparent rules and usage policies.
- **AAS & submodels**: the AAS structures asset metadata and lifecycle documentation; Product-Process-Resource (PPR) models underpin Digital Product and Process Passports.
- **Data/service catalogue**: publish/consume services and datasets; onboarding pathways for SMEs.
- **Analytics & simulation**: Machine Learning (ML) for moulding presetting; CAD/CAM and Computational Fluid Dynamics (CFD) ; process simulation and digital assistance at the machine to improve first-time-right.

4. Implementation

a. *How the solution was integrated into the use-case organisation's existing systems or processes*

Partners connect via standardised interfaces; AAS-based handovers encapsulate configuration and documentation; services are described in a catalogue for discovery and reuse. SMEs can join via AMIDS to access trainings, the test environment and the partner network before committing to larger roll-outs.

5. Benefits & Impact

a. *Benefits for stakeholders*

Description of Benefit	Dimensions				Role this benefit applies to
	End users	Legal & Governance	Functional & Participant related	Technological	
Traceable lifecycle data via AAS/DPP			X	X	Manufacturers, Toolmakers
Faster injection-moulding setup (presetting via ML/ CFD)	X			X	Machine OEMs, Operators
Energy/PCF tracking & reporting		X		X	Sustainability teams
Low-threshold access to Gaia-X testbed		X	X	X	SMEs

b. *Benefits for the end-users*

- improved first-time-right setup for injection-moulding cells
- better traceability and quality
- reduced manual effort through standardised handovers
- training and support to kick-start pilots
- clearer PCF baselines for products and processes.

6. Added Value through Gaia-X

a. *Alignment with the Gaia-X vision*

Gaia-X provides a common language for participation, trust and interoperability. By aligning with PRC guidance and the national Gaia-X Hub, AMIDS turns abstract principles, sovereignty, transparency, portability, into concrete governance, credentials and catalogues. This reduces bilateral negotiation overhead and makes cross-company collaboration feasible at SME scale.

b. *Alignment of current architecture and technology stack with the Gaia-X technology model, and any convergence needs*

Architecture follows Gaia-X's federated model:

- participants and services identified via verifiable credentials
- descriptions registered in federated catalogues (not yet fully implemented)
- usage policies attached to data/services
- compliance/labelling tracked against PRC criteria.

On the asset level AAS and PPR-based submodels structure the Digital Product/Process Passports that flow across the lifecycle and supply chain.

7. Use-case scaling

a. *Requirements and steps for a new member (user, provider, or service providers) to join use-case*

Onboarding steps for new members:

- join AMIDS under the appropriate tier (individual, SME, mid-cap, large, University/ University of Applied Sciences (FH)
- agree to the participation rules and guidelines
- connect one or more systems/assets via standard interfaces and AAS-based handovers
- publish/consume services via the catalogue
- and participate in trainings

This path is designed to create early wins and a clear route to bigger follow-on projects.

b. *Other sectors that could benefit by making use of the resources in this usecase*

The AMIDS pattern: federated identity, catalogues, AAS-based handovers, and DPP/DPssP, transfers to adjacent discrete manufacturing domains like machinery, automotive, packaging and electronics assembly. Any context that needs cross-company traceability, design-to-production continuity and audit-ready sustainability data can benefit.

8. Next steps

a. *What are the next steps of your project functionally-speaking?*

The next steps involve successfully concluding the ResearchLin-X project of AMIDS and translate the findings generated to PilotLin-X to drive the ongoing Gaia-X initiatives further.

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