Gaia-X MAGAZINE

December 2025 | Edition 7

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gaia-x

Season 2.0 of Data Spaces & Digital Ecosystems

Cross-Industry, Cross-Domain Trust at Scale.

HIGHLIGHT

The Gaia-X 3.0 “Danube” Architecture.

Christoph Strnadl, CTO at Gaia-X

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INTERACTIVE
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FOREWORD – WELCOME OPENING

Dear readers,

The publication of the seventh edition of the Gaia-X Magazine comes at a time of tangible progress for our community. Our recent Summit in Porto was a defining moment, demonstrating not only the maturity of our technical and governance work, but also the shared ambition that unites our ecosystem. With this, we have entered what we call Season 2.0 of Data Spaces. A phase in which foundational ideas are being translated into operational and scalable solutions across key sectors, including mobility, energy, manufacturing, health, and agriculture.

This edition offers a window into those developments. It captures the perspectives and achievements of our members, Hubs, and Lighthouse Projects, and it provides an update on our latest initiatives as well as a look at what's ahead. Together, these stories reflect a growing movement built on trust, openness, and interoperability.

As Gaia-X continues to evolve, our focus remains on delivering long-term impact, ensuring that our principles are not only theoretical foundations but actively guide to the creation of real-world digital ecosystems.

I extend my sincere thanks to all members of the Gaia-X community for your commitment, collaboration, and belief in our shared vision.

Warm regards,

Ulrich Ahle
CEO, Gaia-X AISBL

We have entered what we call Season 2.0 of Data Spaces. A phase in which foundational ideas are being translated into operational and scalable solutions across key sectors, including mobility, energy, manufacturing, health, and agriculture.

Ulrich Ahle

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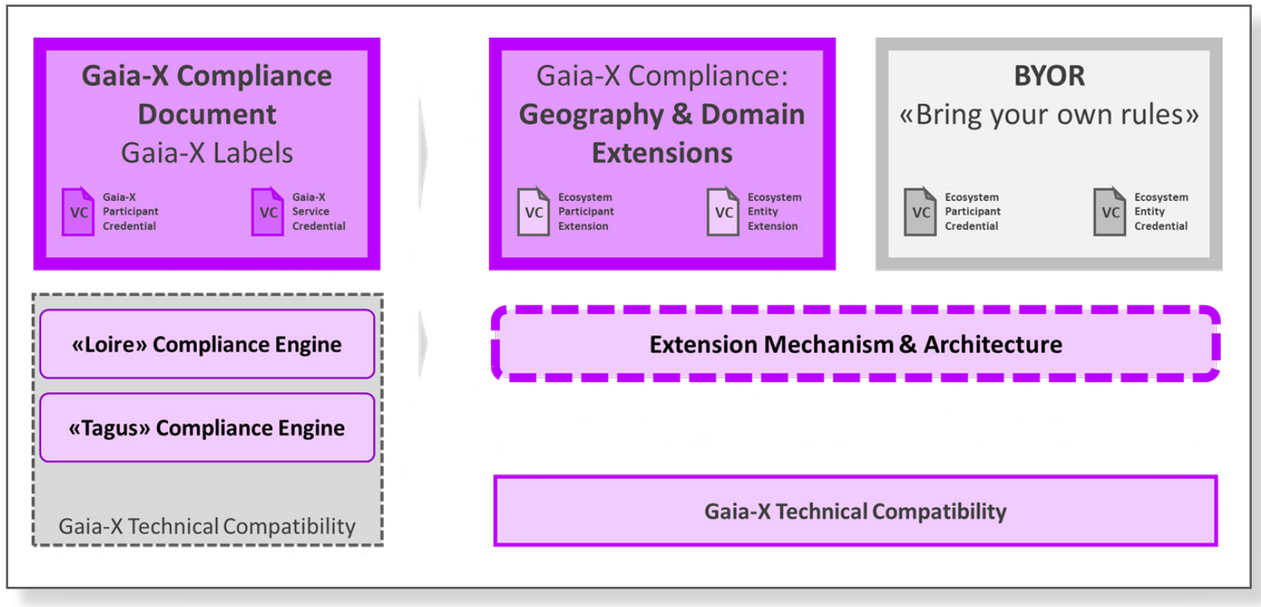
MAIN STORY
HIGHLIGHTED

In every edition of our magazine, we are thrilled to present you with a highlighted story, offering a comprehensive and captivating exploration of a significant topic. Within this section, you can expect to find engaging interviews with key figures, expert analysis, and the latest updates.

2.1

Season 2.0 of Data Spaces & Digital Ecosystems. Cross-Industry, Cross-Domain Trust at Scale. The Gaia-X 3.0 “Danube” Architecture.

Christoph F. Strnadl, CTO of Gaia-X AISBL



TL;DR

The Gaia-X 3.0 “Danube” architecture and software components implement the technical requirements of all four scenarios of the Gaia-X Policy & Rules Committee’s «White Paper on Geographical and Domain Extensions of the Gaia-X Framework». By completely separating the compliance layer from the Gaia-X technical compatibility layer, ecosystems may define their own (arbitrary) compliance criteria and implement corresponding software for automating the compliance checks. These software components execute in the form of so-called compliance extensions in the context of the new Gaia-X Core Engine which secures Gaia-X technical compatibility.

The (new) Gaia-X Meta-Registry does not merely support the Gaia-X Core Engine; it overcomes the cross-ecosystem trust dilemma (i.e., how sovereign ecosystems can trust each other) by hosting ecosystem trust profiles where ecosystems specify local and, possibly, also foreign trust service providers of other ecosystems and the credentials they choose to trust.

Introduction & Requirements

In its «White Paper on Geographical and Domain Extensions of the Gaia-X Framework», the Gaia-X Policy and Rules Committee (PRC) recognises that many ecosystems will need the possibility to extend, amend, or otherwise change the criteria of the Gaia-X Compliance Document. This includes the ability to introduce completely new rules for their respective digital ecosystem or data spaces. Two highly important types of these amendments are (i) different geographic jurisdictions (e.g., Switzerland outside the EU, non-European countries) and (ii) various (industry) domains such as manufacturing, aerospace, healthcare, and many others.

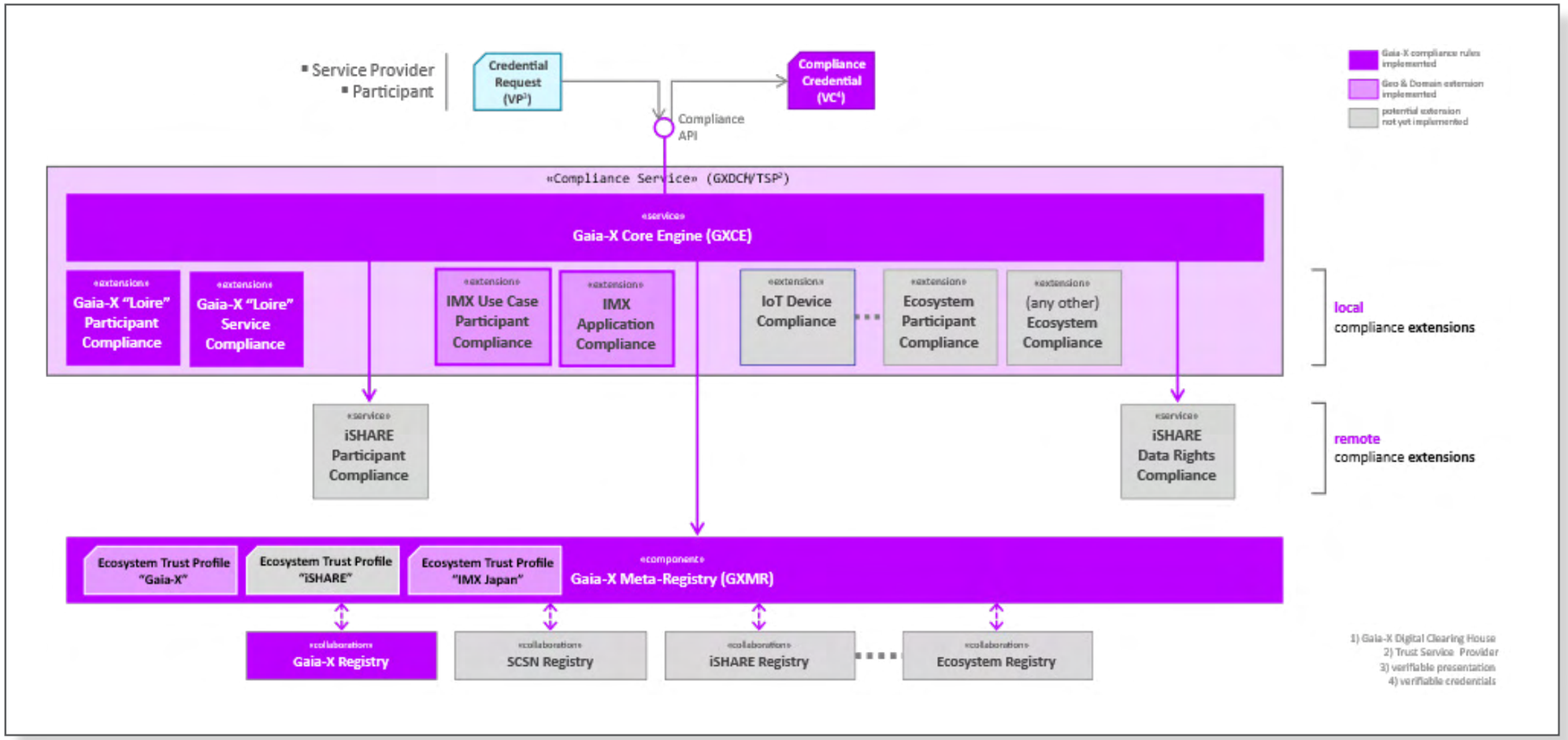
Consequently, the white paper identifies certain scenarios where external entities, so-called “**custodians**”, develop these ecosystem-specific compliance rules and may also provide the corresponding software code for automating the actual compliance checking. Scenario 3 describes the situation where these new ecosystem rules explicitly respect European and/or Gaia-X values – depicted in the diagram above as purple box “Geography & Domain Extensions”. Scenario 4 is decidedly looser and allows custodians to develop any type of rule set without reference to European or Gaia-X values (called “Bring your own rules” in the diagram).

The task of the CTO team, in particular the Gaia-X lab team, was to provide a suitable software implementation of these (high level) “requirements”. That means the implementation needs to include an extension mechanism for hosting almost arbitrary rules engines while at the same time ensuring Gaia-X technical compatibility as specified in our Gaia-X Architecture Document 25.11.

This task, while simple to formulate, turned out to be so not easy to execute. This was due to the fact that our existing «Tagus» and «Loire» compliance engines are based on a rather monolithic architecture which is not capable of hosting any form of extension. As a consequence, one could not separate a “Gaia-X technical compatibility” layer (indicated by the gray dash rectangle in the diagram) from the actual rules checking code.

Gaia-X 3.0 “Danube” Architecture

The **Gaia-X 3.0 “Danube” software release** is based on an exhaustive re-engineering of the existing Gaia-X Loire components and completely separates Gaia-X technical compatibility from **any form of compliance**, be that Gaia-X compliance or any other ecosystem compliance. This supports the integration of **arbitrary compliance or rules engines** and thereby provides a versatile run-time environment for trust service providers (TSPs) for any ecosystem. Ecosystems, thus, are not limited to (i) the criteria specified in the Gaia-X Compliance Document or (ii) Gaia-X Digital



Clearing Houses (GXDCHs) as sole TSPs for establishing compliance. Thereby, the "Danube" architecture and software release allow the implementation and automation of **all four scenarios** identified in the white paper.

The Danube architecture (see diagram above) recognises three major building blocks:

- **Gaia-X Core Engine** - ensuring Gaia-X technical compatibility, hosting local compliance engines (called "local compliance extensions"), and providing means ("proxies") to access remote compliance extensions.

  The Gaia-X Core Engine implements the same call pattern as previous compliance engines, where service providers or ecosystem participants submit a credential request in the form of a verifiable presentation (VP) and expect to receive a verifiable credential (VC) attesting the requested compliance if all criteria are met.

- **Gaia-X Meta-Registry** - exposing metadata characterising different ecosystems, their respective trust service providers, and the verifiable credentials issued by them—called ecosystem trust profiles. This solves the cross-ecosystem trust dilemma (see below in the special section on the Gaia-X Meta-Registry).

- **Compliance extensions** – these software components actually implement the compliance engines for the different ecosystem rule sets.

Compliance extensions

The extension mechanism of the "Danube" architecture allows the integration of arbitrary compliance engines. The diagram above indicates several already implemented or possible extensions:

- Our existing **Gaia-X "Loire" compliance engine**[1], for instance, will simply run as one extension in the Danube architecture.

- For a use case of the IMX-C (International Manufacturing-X Council), we have implemented an **IMX extension** for checking criteria related to participants or other entities of this particular ecosystem.

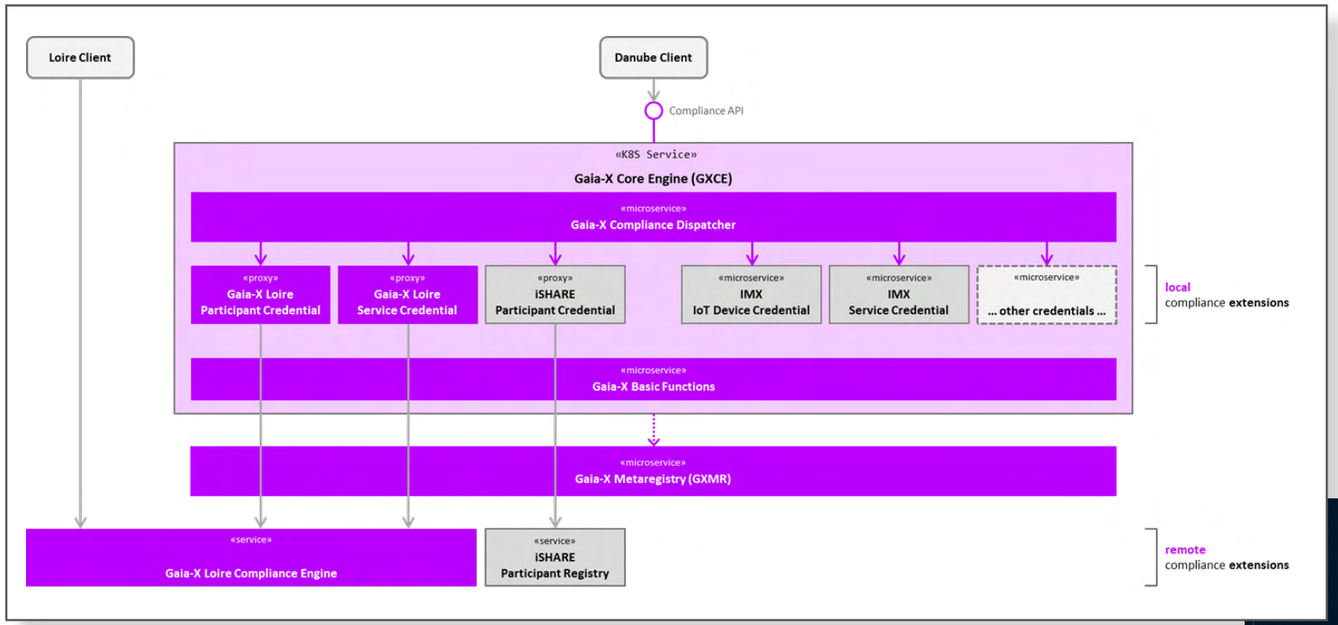
- The "Danube" architecture allows the integration of large and complex foreign compliance regimes such as the **iSHARE trust framework**. The only prerequisite for this is that such an extension can be made Gaia-X technically compatible. For iSHARE, this will be possible with release 3.0. However, this version was not released at the time of writing this article, so we could not implement it (yet).

- We also indicate the possibility that extensions check criteria necessary to obtain **any other type of credential** related to particular ecosystem rule sets, such as for IoT (internet of thing) devices (cf. the grey box in the diagram), AI agents, data space connectors, and every other conceivable type of attestation.

1 - more correctly: Gaia-X Compliance Engines of version 2.x. The Gaia-X 3.0 "Danube" architecture cannot integrate "Tagus" type compliance, i.e., Gaia-X Compliance Engines of version 1.x, because they are no longer technically compatible with the latest specification of the Gaia-X Architecture Document (e.g., they use a different signature mechanism for verifiable credentials).

Gaia-X 3.0 “Danube” Implementation

The following diagram presents the actual implementation architecture of Gaia-X 3.0 “Danube”.



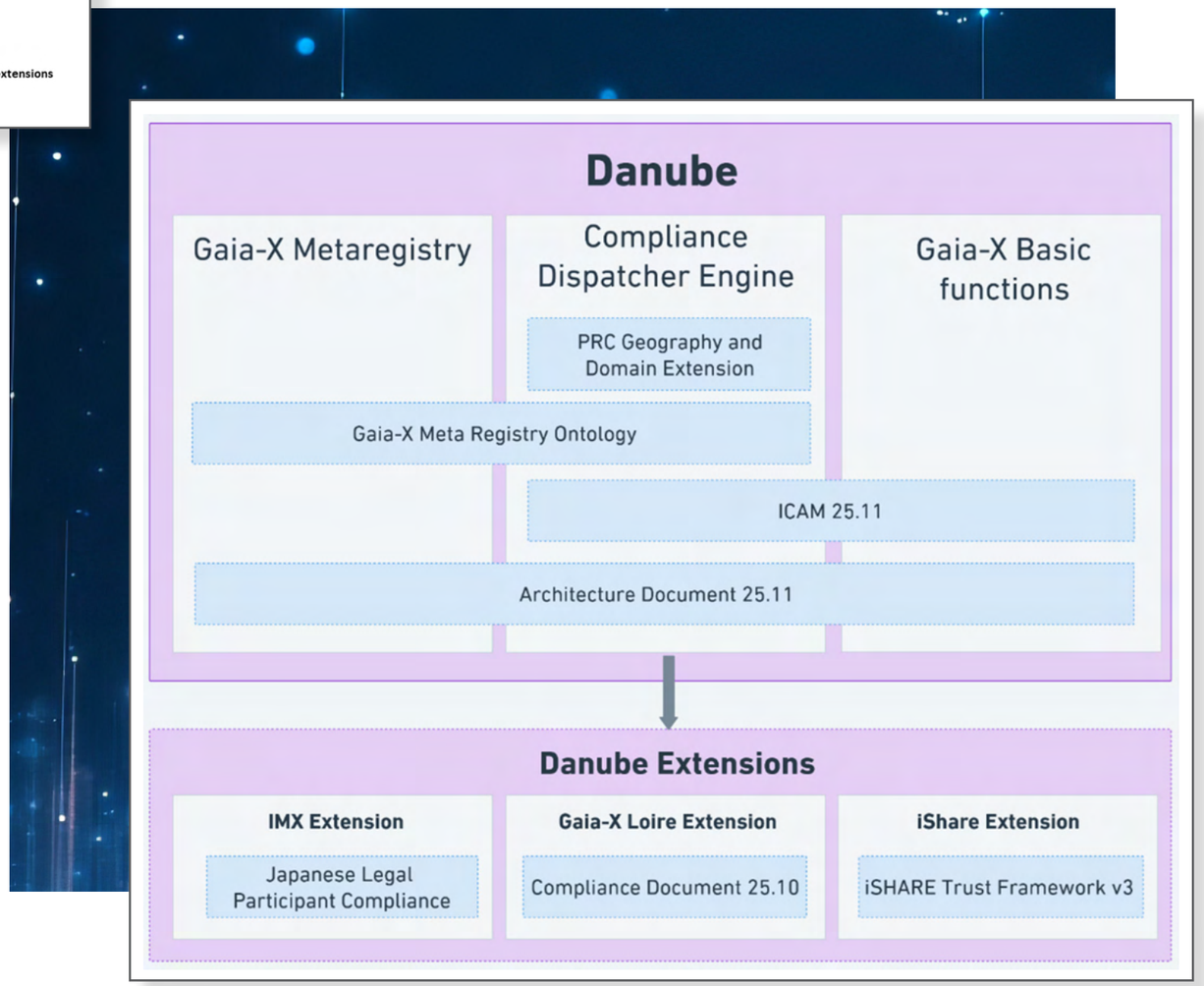
The Gaia-X Core Engine features the following two important microservices:

Component	Description
Gaia-X Compliance Dispatcher	➲ Accepts incoming verifiable presentations and dispatches the verifiable credentials contained therein to the local or remote compliance extension required to verify the claims
Gaia-X Basic Functions	Implement and expose a set of commonly used functions such as ▪ **signature** functions » verify and decode a VC-JWT » verify a gx:LabelCredential VC[2] ▪ **DID**[3] functions » resolve a did:web » validate a did document » verify if a certificate is trusted (using Gaia-X Trust Anchors) ▪ **SHACL**[4] functions » validation using Gaia-X shapes » validation using ecosystem-specific shapes

The **Gaia-X Basic Functions** microservice represents your go-to toolbox implementing useful functions commonly encountered in compliance settings based on self-sovereign identity (SSI) principles. It works almost as a showcase or sandbox for the latest implementations of the relevant standards. It can be used internally by any compliance extension, and also externally as its API[5] is exposed to external callers (depending on your security policy). This considerably lowers the entry barriers for organisations new to SSI and automated compliance.

Regarding the set of supplied functionalities: We are open to additional contributions from the community!

The following diagram shows the relationship between our official Framework Documents and the implemented “Danube” software components.



2 - verifiable credential **3** - decentralized identifier **4** - W3C Shapes Constraint Language

5 - application programming interface

Gaia-X Meta-Registry and the Cross-Ecosystem Trust Dilemma

Ecosystems — typically through an ecosystem governance authority — establish a set of policies and rules their participants have to follow. These rules and their automation in the form of suitable software components constitute an ecosystem's trust framework. We need to stress that ecosystems by design are completely autonomous in their choices regarding the trust framework and only depend on the particular governance structure they have adopted.

Given this sovereignty over their own trust frameworks, the dilemma then arises how ecosystems may trust each other when, in fact, no supra-ecosystem authority can force ecosystems to trust another one.

The Gaia-X Meta-Registry "solves" this dilemma by offering a universal schema[6] how ecosystems may autonomously define which trust service providers (TSPs) their participants trust and for which types of attestations (or credentials). Such a declaration is called an **ecosystem trust profile**. The point here is that ecosystems are free to also include **foreign TSPs** in their **ecosystem trust profile**, that is, TSPs which are accepted by other ecosystems and belong to the other ecosystem's trust profile. In case this autonomous decision to trust selected (not necessarily all!) TSPs is reciprocal, mutual trust between the two ecosystems is established.

Approach and implementation are a little bit subtler but clearly work: We not only researched the foundation of this in a (mathematical) paper, but also demonstrated it in the course of the IMX-C project during the SPS fair (November 2025, Nuremberg, Germany) in the form of a federated trust use case.

MYTH: "Danube" and "Loire" are incompatible"

We are aware of myths claiming that the "Danube" and "Loire" releases are incompatible. This is **not true** for things related to **Gaia-X compliance**.

One source of this could be the imprecise but wrong notion of equating the name of our software architecture and major releases ("Tagus" and "Loire") with the concept of "Gaia-X compliance". Gaia-X compliance can only be established relative to a specific version of our Gaia-X Compliance Document. While "Tagus" software components are intimately associated with the "Trust Framework Document 22.10" (the precursor of today's Compliance Document), the "Loire" architecture of the Gaia-X software components was used for all Compliance Documents since 24.04 resulting in different minor releases of the respective software components (see the GXDCH Overview Page for the latest versions).

"Danube" no longer has anything to do with a particular compliance engine or version of the Gaia-X Compliance Document, but "only" ensures Gaia-X technical compatibility. Hence, one cannot replace an existing "Loire" compliance engine with a "Danube" compliance engine, because "Danube" does not contain anything like a "Danube" compliance engine. Incidentally, there is also no "Danube" Compliance Document as well.

A "Loire" compliance engine basically runs (loosely speaking) "inside" the "Danube" Gaia-X Core Engine. Hence, "Loire" and "Danube " are 100% compatible.

6 - actually an ontology

03

Gaia-X PROJECT DEVELOPMENTS

This dedicated section about project developments aims to bring you closer to the forefront of the progress made on the Gaia-X project. It discusses the latest advancements, initiatives, and achievements from a technical, strategic, operational or communication perspective. Whether you are part of the Gaia-X community, an industry professional seeking information or simply an avid reader with a curiosity, this section is for you.

Operations

Communications

03

3.1.1

Gaia-X Membership

Daniela Mockler, Senior Members' Manager at Gaia-X AISBL

In today's rapidly evolving digital landscape, data has become far more than an operational asset. It is the driving force behind economic growth, technological innovation and societal development. Organisations across the world are seeking reliable and secure ways to collaborate, unlock the value of shared data and ensure that digital systems remain transparent and trustworthy. Gaia-X's mission is to establish the de facto standard for federated and trusted data and infrastructure ecosystems, creating an environment in which organisations can collaborate confidently while retaining full control over their digital assets. Originating as a European initiative and now embraced by an international community, Gaia-X advances a regulatory and technical framework that enables the interconnection of distributed services and ensures interoperability across borders and industries. Through the joint development of policy rules, functional requirements and technical specifications, members from around the world contribute to a dynamic ecosystem that empowers the creation of new markets, accelerates responsible data-driven innovation and avoids dependency on any single actor.

A global community built on collaboration and shared principles

At the heart of Gaia-X lies a diverse and constantly expanding community of companies, public institutions, research bodies and innovators from around the world. While the initiative began as a predominantly European endeavour, it has since evolved into a truly international collaboration, driven by a shared commitment to trustworthy, secure, and interoperable data and infrastructure ecosystems. In an era where digital ecosystems operate across jurisdictions with vastly different regulatory, cultural, and technical contexts, Gaia-X provides a harmonised, flexible, and adaptable foundation.

By joining Gaia-X, organisations gain direct access to a dynamic network, where co-creation, open dialogue and cross-sector collaboration fuel progress. Members can gain early insights into emerging developments and contribute expertise in dedicated working groups, committees, and sprints. These spaces offer opportunities to shape technical specifications, influence policy discussions, and engage directly with peers.

In a global digital environment where regulatory frameworks, market conditions and technological capabilities vary widely, participating in a community of this scale and diversity provides invaluable strategic advantages. Gaia-X membership ensures that organisations are not merely observers but active contributors to an international effort shaping the future of trusted data collaboration.

Navigating data policy

The digital policy environment is changing rapidly worldwide. Regulations such as the Data Governance Act, Data Act and AI Act in Europe, emerging data governance laws across Asia, and various regional frameworks create an increasingly complex landscape.

Gaia-X offers an avenue for organisations to navigate these complexities with greater clarity. Although rooted in European regulatory principles, the Gaia-X Trust Framework, through its latest 'Danube' release, offers mechanisms that allow extensions tailored to regional or domain-specific requirements.

A strategic moment: Expanding the Trust Framework to new domains and regions

Gaia-X is currently at a pivotal stage of growth. As adoption accelerates, the initiative is expanding its Trust Framework into new domains and geographic regions. This evolution is essential to ensure broad applicability across industries and countries. **This now makes an excellent time to become a member.** Gaia-X is actively developing:

- Domain extensions, which tailor the Trust Framework to specific industries
- Geographical extensions, which ensure compatibility with regional requirements and support international uptake.

As a member, you can propose your own domain or region as an extension use case. This creates a unique opportunity to influence the direction of Gaia-X's global expansion by ensuring that your ecosystem's needs and perspectives are included from the outset.

Unlocking the full value of membership through active engagement

While membership brings numerous advantages, the true value of Gaia-X is realised when organisations engage actively. Gaia-X thrives on participations; its strength comes from the collective expertise and collaborative contributions of its global community. Active engagement allows members to shape the standard for trusted digital ecosystems of the future, accelerate innovation through collaboration, and expand their international networks. Engagement does not need to be resource heavy. Even small, consistent contributions, such as sharing insights or presenting challenges, can create meaningful impact. Gaia-X lives through co-creation, and members who lean in actively help shape a framework that ultimately benefits their own organisations as well as the broader community.

Gaia-X provides fertile ground for collaborative innovation. By bringing together organisations from different countries, industries, and areas of expertise, it enables partnerships that might never occur otherwise. These collaborations can lead to pilot projects that address shared challenges and innovative joint solutions.

An invitation to shape the future together

Gaia-X represents a strategic opportunity for organisations that wish to lead in responsible data innovation, strengthen their global network, and help build the foundations of trusted digital ecosystems. With the Trust Framework now expanding into new domains and geographies, this is the ideal moment to become involved.

Membership offers not only insight into emerging standards but also a voice in their creation. By proposing your own domain or region as a potential extension use case and by participating actively in the Gaia-X community, you can help shape the digital ecosystems of tomorrow. Gaia-X is more than an initiative: it's a global community. Together, we are building a digital environment where collaboration, innovation, and sovereignty coexist. The future of trusted digital ecosystems is being written today. We warmly invite you to contribute to its next chapter.

01

Use our contact form and let us know that you are interested in becoming a member or contact aisbl-membership@gaia-x.eu.

02

We will email you the documents you need to fill out for your application.

03

Fill in the documents and send them back to us.

04

We will come back to you with the decision taken by the Board of Directors and guide you through the onboarding.

3.1.2

Why Being an Endorsed Lighthouse Ecosystem Matters – And Why Lighthouse Ecosystems Are First Movers in Interoperable, Trusted Data Spaces

Petra Makovec, Operations Manager at Gaia-X AISBL

As Europe accelerates its transition toward trusted, sovereign, and interoperable data ecosystems, the Gaia-X Endorsement Programme offers organisations a unique opportunity to lead this transformation. Becoming an Endorsed Gaia-X Project is more than a badge of honour; it is a strategic advantage rooted in compliance-by-design, interoperability, and future-proof alignment with EU regulatory frameworks.

According to the Gaia-X Endorsement Programme, endorsed projects benefit from increased visibility, recognition as early adopters, access to exclusive resources that support the domain extensions, and deep integration into the Gaia-X requirements process.

At the highest maturity level — Lighthouse Ecosystems — projects that demonstrate not only compliance but scalability, market relevance, and the capability to act as industry transformers.

First Movers in Domain and Geographical Extensions

What sets Lighthouse Ecosystems apart is their pioneering approach: they are among the first projects to adopt domain-specific and geographical extension profiles, ensuring that their services and data models remain interoperable across regions and sectors. The Gaia-X Compliance Document emphasises extensibility and modularity as core design principles, enabling ecosystems to build on common compliance baselines while tailoring requirements for specific sectoral or regional needs.

By adopting these extensions early, endorsed projects position themselves as interoperability leaders — able to connect seamlessly with other EU data-space initiatives, from manufacturing to healthcare to mobility. This creates a powerful network effect: the more interoperable the ecosystem, the higher the adoption, lowering onboarding friction for new participants.

Compliance-by-Design: A Strategic Business Case

With the EU's upcoming Digital Product Pass (DPP) and increasing regulatory demands on transparency, sustainability, and data governance, compliance costs are rising —especially for SMEs. Gaia-X endorsed projects benefit from alignment with the Gaia-X Trust Framework, which is grounded in verifiable credentials, standardised service descriptions, and machine-readable compliance proofs. These mechanisms are integrated into the Gaia-X Digital Clearing House (GXDCH), automating validation and verification of claims to ensure trustworthy data exchange infrastructures.

For Lighthouse Ecosystems, building services with compliance-by-design significantly reduces the future regulatory burden for all participants. SMEs, in particular, benefit from:

- Pre-defined compliance templates
- Automated conformity checks
- Reduced due diligence requirements when joining the ecosystem
- Lower future onboarding costs, as compliance expectations remain stable and centrally validated

This is critical as DPP, the Data Act, and sector-specific regulations tighten requirements around data provenance, sustainability reporting, and secure data lifecycle management.

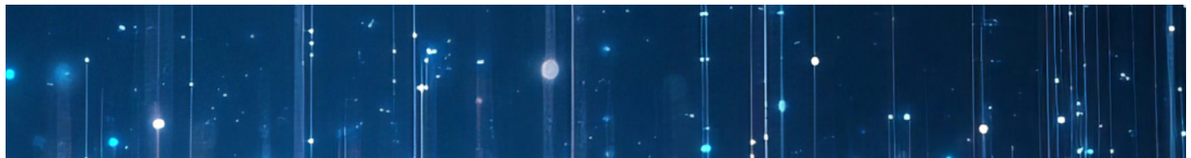
Interoperability With Gaia-X Data Spaces

Lighthouse Ecosystems fulfil one of the core criteria for Lighthouse status: enabling interoperability and portability of data and applications across sectors using non-proprietary standards. This interoperability is essential for real-world adoption of data spaces and ensures that data can move freely and securely, supporting cross-industry use cases, circular economy workflows, and harmonised supply chain transparency.

By serving as demonstrators for scalable, replicable use cases, Lighthouse Ecosystems amplify Gaia-X's mission: creating open, sovereign, decentralised digital ecosystems built on trust and European values.

Conclusion

Becoming an endorsed Gaia-X Project is more than meeting a checklist—it is a strategic commitment to shaping Europe's digital future. With compliance-by-design, interoperability leadership, and alignment with upcoming regulatory frameworks, Lighthouse Ecosystems are demonstrating what trusted and scalable data spaces look like in practice. As first movers, they not only lead their industries—they help define the standards the rest of Europe will follow.



3.2.1

The Gaia-X Discovery Quest
An AR Adventure

Communications team, Gaia-X AISBL

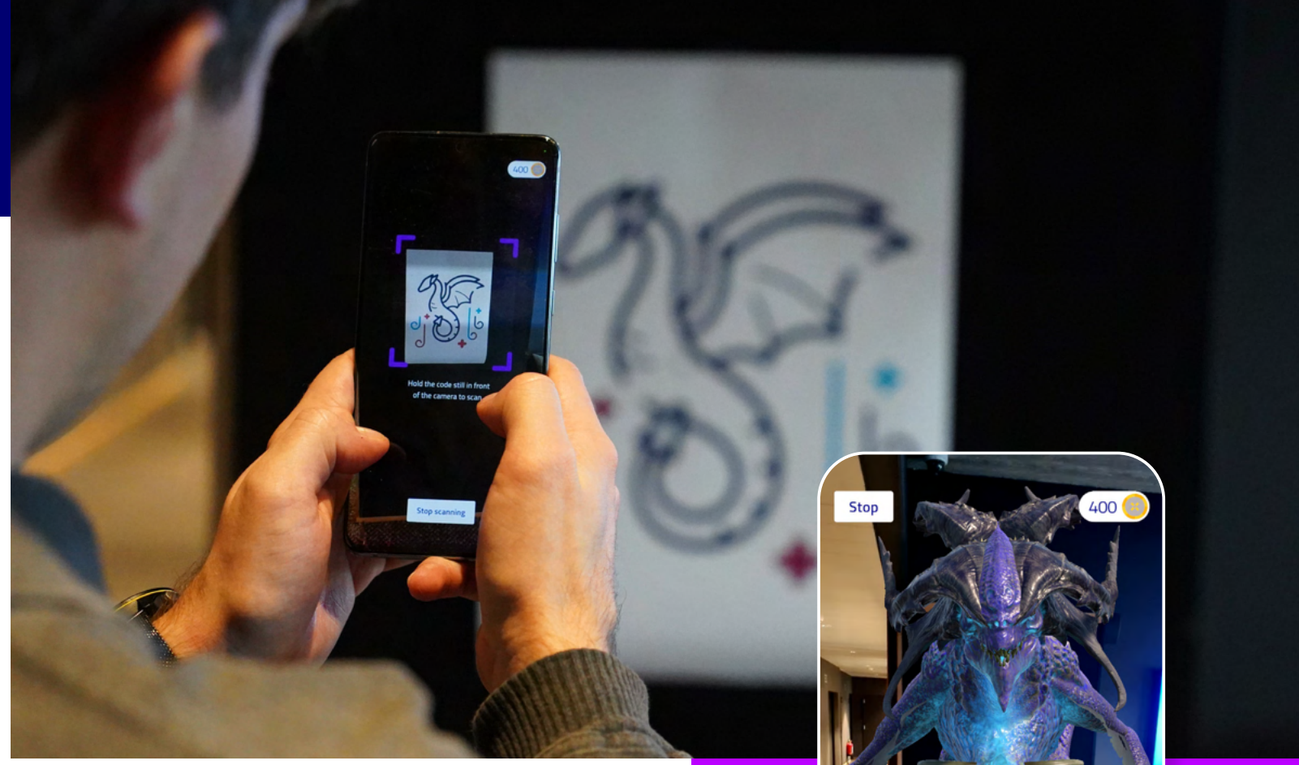
During the Gaia-X Summit on 20 and 21 November 2025, attendees stepped into a world where data sovereignty met data wizardry. The Gaia-X Discovery Quest, an Augmented Reality (AR) game created for the Gaia-X Summit, transformed the venue into an immersive, story-driven landscape that blended technology, play, and real-world interaction.

Designed to encourage participants to explore Gaia-X concepts in a hands-on way, the game guided visitors through AR encounters, physical quests, and knowledge-driven challenges, each rewarding them with Gaia-X coins and helping them ascend from '*Data Wizard Level 1* to *Data Wizard Level 4*'. The magical theme helped turn complex digital concepts into accessible narratives that invited exploration rather than explanation.

Over the course of 1.5 days, **142 participants** immersed themselves in the world of data wizardry, each striving to reach the highest level. In the end, a **total of 695 challenges were completed**, and three outstanding players rose to the top and claimed the title of Ultimate Data Wizard.

Gameplay and challenges - Exploring a hidden world

To play the game participants downloaded the Gaia-X AR app and began exploring the venue in any order they wished. In total there were 10 challenges divided into 2 categories, 5 AR challenges and 5 Real world challenges.



AR challenges aimed to turn complex Gaia-X concepts into immersive mini-games with story elements. Participants had to:

1. Break into a vault to learn about **trust and security**
2. Train a wild dragon to learn about **Gaia-X compliance**
3. Manage data exchange in a city to understand the value that data creates (**Data Economy**)
4. Lay siege on a barrier that prevents **interoperability**
5. Grow and expand the Gaia-X Forest to learn about the **added value** that Gaia-X provides

Real world challenges aimed to connect the community and spread the Gaia-X message. These challenges required in-person engagement: visiting the Gaia-X booth, using the Gaia-X Summit hashtag on Gaia-X on social media, asking a question during a live Q&A session, or networking with peers.

The Gaia-X Academy: Knowledge Behind the Magic

The Discovery Quest was deeply integrated with the Gaia-X Academy, which served as the central source of knowledge, hints, and learning materials connected to the challenges. By creating an Academy account, players gained access to insights that helped them advance more quickly through the game and deepen their understanding of the Gaia-X ecosystem.

Winners of the Gaia-X Discovery Quest 2025 – Meet the ultimate Data wizards

A total of 142 participants embarked on the Gaia-X Discovery Quest during the Summit, turning the venue into a lively arena of data wizardry. Their enthusiasm and curiosity brought the game to life. We are delighted to congratulate the three top-ranking winners, whose skill, speed, and dedication earned them the highest number of Gaia-X coins. A heartfelt thank-you goes out to everyone who joined the adventure and helped make the Quest such a memorable success.

1ST PLACE WINNER

ANGÉLICA CASTRO

"The Discovery Quest was a genuinely engaging experience that helped me deepen my data skills and sharpen my analytical thinking in a fun and meaningful way. It also made it easy to connect with others. Overall, it felt like a forward-thinking and truly impactful initiative."

3RD PLACE WINNER

ROMAN GEHRER

"Beyond the challenges themselves, the greatest achievement of the game was how it fostered real-world connections within the community. The incentive to collect coins sparked many valuable conversations at the summit that I likely wouldn't have had otherwise."

2ND PLACE WINNER

RUI PEDRO RIBEIRO

"I believe that the Discovery Quest initiative has given me a clearer and more practical understanding of the added value that Data Spaces can provide in the development of Data Ecosystems, in the collaboration of different participants in an interoperable data exchange, in the extraction of knowledge and in the exploration of the world's new oil."

3.2.2

TECNALIA Research and Innovation, the first Gaia-X Academy Temporary Access Reseller

Communications team, Gaia-X AISBL

We are pleased to announce that TECNALIA Research and Innovation is the first Gaia-X Academy Temporary Access Reseller.

The Gaia-X Academy is an e-learning platform from Gaia-X AISBL where business, functional and technical information can be found to better understand the association, its goals and deliverables.

It is organised into streams, which are sets of courses (training alongside tutorials) designed with one goal: equipping the learners with all the necessary knowledge to be able to achieve a "mission". A Gaia-X Certificate, recognised and sharable on LinkedIn, will be issued for each stream when you reach the required score.

Access to streams is included as one of the many member benefits of the Gaia-X AISBL and unlimited for all staff of Gaia-X members.

However, non-member Gaia-X users can now purchase temporary access from the Gaia-X Academy's dedicated partner, TECNALIA Research and Innovation.

Packaged within other courses, TECNALIA Research and Innovation is entitled to resell temporary access to one stream for the duration of one month. To do so, users just need to get in touch with TECNALIA Research and Innovation by email: gaia-X_Academy@tecnalia.com.

"Tecnalia supports the Gaia-X ecosystem with its technological expertise, contributing to training in the "Trust Framework" by providing access tokens for official certifications at the Gaia-X Academy.", Jon Ander Ormanza, IT & Digital Market Manager, TECNALIA Research and Innovation.

Five streams are already available on the Gaia-X Academy platform:

- Gaia-X Business Advisor: get the keys to the Gaia-X world from a business perspective and learn important information about the Data Economy
- Gaia-X Functional Advisor: understand what Gaia-X Trust and Compliance mean to advise partners or customers
- Gaia-X Functional Expert: be able to interact with Gaia-X partners and participate in working groups
- Gaia-X Technical Advisor: technically guide your partners or customers on how to gain Gaia-X Compliance
- Gaia-X Discovery: understand what Gaia-X is from a functional point of view (open to everyone - no certificate received)

More information about the Gaia-X Academy can be found on our website.

As a reminder, all Gaia-X members, thanks to their membership benefits, can also share access with some non-member Gaia-X Academy users (to find out more, please contact aisbl-membership@gaia-x.eu).

04

Gaia-X **PARTNERS**

This partner section serves as a platform to recognise and express our gratitude to the individuals and organisations who have chosen to join forces with us. It is through their unwavering support, shared vision, and commitment to excellence that we have been able to overcome challenges, seize opportunities, and achieve remarkable milestones. It is therefore with great pleasure that we dedicate this section to showcase their stories and expertise.

Summit 2025

04

4.1.1 Neusta Aerospace

COOPERANTS Data Space – The European Data Ecosystem for the Aeronautics and Space Sector

Arno Scheidereiter , CEO of Neusta Aerospace

Introduction

The digitalisation of the European aeronautics and space industry is undergoing a fundamental transformation: moving away from isolated data silos toward sovereign, interconnected data spaces that enable collaboration, innovation, and competitiveness. With the COOPERANTS Data Space (Collaborative Processes and Services for Aeronautics and Space), such a solution comes into focus — recognised as a Gaia-X AISBL Lighthouse Ecosystem. (cooperants.de)

The following presents the initiative across its key aspects: its history and problem landscape, the solution, the participants, a concrete use case, the role of trust via Gaia-X Digital Clearing House mechanisms, and an outlook on the space industry.

1. History, Problem, and Solution

History

The COOPERANTS project officially launched on February 11, 2022, under the funding initiative of the German Federal Ministry for Economic Affairs and Climate Action (BMWK) for GAIA-X-based development of innovative data spaces in the aeronautics and space sector. (dlr.de)

The project is led by DLR – German Aerospace Centre, Institute of Space Systems in Bremen, together with a consortium of industry partners, research institutions, SMEs, and start-ups. (dlr.de)

In 2025, COOPERANTS was officially recognised by Gaia-X as a Lighthouse Ecosystem. (gaia-x.eu)

Problem

Numerous data silos exist across the aeronautics and space industry: manufacturers, suppliers, and research organisations often work with different system landscapes, data formats, and collaboration tools. This leads to inefficiencies, increased integration and coordination efforts, and risks regarding data sovereignty, compliance, and interoperability. This challenge is clearly outlined in the position paper “Data spaces for a sustainable aerospace industry.” (gaia-x-hub.de)

SMEs and start-ups, in particular, often lack the infrastructure or standards needed to participate in such data and service ecosystems. Furthermore, the complex lifecycles of aircraft and spacecraft — from design to production to maintenance — demand new collaboration models.

Solution

COOPERANTS addresses this challenge by implementing a GAIA-X-compliant data space — including a marketplace for smart services and heterogeneous data integration. (cooperants.de)

The solution enables secure, sovereign data exchange across system boundaries, standardised interfaces, governance models, and, importantly, the inclusion of SMEs. The data space makes data and service sharing possible, opens new digital business models, and strengthens the competitiveness of the European aeronautics and space sector.

2. Participants of the Consortium

The COOPERANTS consortium brings together a heterogeneous mix: large system integrators, medium-sized companies, research institutions, and start-ups — a crucial characteristic of a federated data space. (cooperants.de)

Some prominent partners include:

- **Airbus Defence and Space**: one of Europe's leading aerospace companies.
- **OHB SE**: a medium-sized space technology corporation with strong innovation capacity.
- **DFKI – German Research Centre for Artificial Intelligence**: research partner for digital services and smart services.
- **Fraunhofer IWU**: research institution for engineering and production processes across the product lifecycle.
- **FZI Research Centre for Information Technology**: expertise in software and platform development.
- **itemis AG**: specialist in model- and software-based engineering.
- **Valispace GmbH**: tool provider for systems engineering in the space sector.
- **ZARM Technik AG**: a company in the field of space technology.
- **neusta aerospace GmbH**: software and digitalisation partner for the aeronautics and space sector (see Trust section).

Why a heterogeneous composition is important

A data space only works when data and service providers collaborate with data and service users in an open, trustworthy environment. Large integrators contribute scalability, domain expertise, and established processes, while SMEs and research institutions contribute agility, innovation, and niche competencies. A federated model prevents dependencies on single providers and ensures data and system sovereignty — a core principle of Gaia-X. (gaia-x.eu)

3. Use Case: Collaborative Engineering and Tool Chain

In practice, COOPERANTS demonstrates how collaborative engineering can be implemented across the entire lifecycle of aeronautics and space systems. According to DLR, a digitally enabled environment is created for decentralised teams — whether in the design, production, maintenance, or mission phases. (dlr.de)

Tool Chain (example)

- **SaaS component**: The COOPERANTS marketplace offers smart services — e.g., digital twins, analysis services, augmented-reality assistance systems. (idw-online.de)
- **Data sets**: Heterogeneous data from design, production, testing, and operations can be shared through the data space — with high interoperability and standardised interfaces. (bmwk.de)
- **Marketplace**: Providers and users of smart services meet within a Gaia-X-compliant marketplace, especially SMEs can make their services more easily accessible. (dlr.de)

Example: A digital twin of a rover system ("SherpaTT") was implemented within the project, including datasets from test fields provided through the data space and smart services for fault analysis and collaboration. (idw-online.de)

The result: improved collaboration, reduced inefficiencies, accelerated processes, and lower barriers to entering digital service ecosystems.

4. External Trust Infrastructure: GXDCH by neusta aerospace

A central building block for trust in a data-driven ecosystem is the clearing-house functionality. Here, the contribution of neusta aerospace GmbH (as a consortium partner) becomes essential — operating Aerospace Digital Exchange (ASD-X), an accredited Gaia-X Digital Clearing House (GXDCH) instance. (aerospace-digital-exchange.eu)

What this means in practice:

- Compliance, registry, and notary services for verification and adherence to Gaia-X standards. (aerospace-digital-exchange.eu)
- Trust-building mechanisms that ensure participants know the rules, interfaces, and governance models apply.
- Preservation of data sovereignty and prevention of lock-in or dependencies on single providers.

For COOPERANTS, this infrastructure is a differentiating factor: in the aeronautics and space industry, security, compliance, and trust requirements are exceptionally high — a GXDCH instance helps address them visibly and reliably.

5. Outlook in the Context of the Space Sector

Scaling and Onboarding

COOPERANTS is preparing to transition the data space from pilot and demo phases into operational use. The focus is on scaling — in terms of the number of participants (suppliers, start-ups, research institutions) as well as data volume and diversity. At the same time, onboarding processes are being simplified so new actors can join quickly and easily.

Interoperability

The challenges of heterogeneous data formats, system landscapes, and toolchains remain central — COOPERANTS develops and uses semantic adapters and open interfaces to ensure system and data interoperability across the entire lifecycle. (dlr.de)

Implementation and scaling:

The space sector is increasingly shifting toward Low Earth Orbit (LEO) missions, constellations, and service-oriented ecosystems (NewSpace). Data spaces like COOPERANTS can serve as a foundational layer to connect heterogeneous actors — start-ups, research institutes, traditional OEMs, and space agencies such as the European Space Agency (ESA). Related initiatives such as ASD-X (Aerospace Digital Exchange) also play a role in sovereign data and service infrastructures. Using such data spaces makes it possible to build a resilient, interoperable, and European-sovereign data and service marketplace for the space sector — for missions involving research and industry partners, satellite operators, and service providers. STARLAB is a very concrete example and is having a close look at the project. COOPERANTS could act as the digital backbone for managing and modelling a complex international project like STARLAB. By providing a sovereign data space aligned with Gaia-X Compliance, it would enable all partners to collaborate on system designs, digital twins, configuration data, and lifecycle models in a shared, interoperable environment. This reduces coordination overhead, ensures consistent engineering data, and keeps the entire STARLAB program synchronised and aligned across agencies, primes, suppliers, and research partners.

Thus, the COOPERANTS platform can become a key component of the European space ecosystem and enable new business models (e.g., data-driven services, in-orbit servicing, constellation management).

6. Wrap-up and Outlook

With COOPERANTS, a future-oriented data and service platform is emerging that elevates the European aeronautics and space sector to a new level: secure, sovereign, interoperable. The federated approach — large companies, SMEs, and research institutions together — provides the necessary breadth and depth. The "Collaborative Engineering" use case demonstrates in practice how data spaces can be used. The integration of a Gaia-X Digital Clearing House infrastructure via neusta aerospace and ASD-X provides the required trust and compliance.

Looking ahead, the potential lies in scaling beyond the pilot phase — toward active use in LEO and space environments with new actors and innovations. COOPERANTS thus offers a clear pathway to European digital sovereignty in the aerospace sector.

We invite decision-makers from industry, SMEs, and research: become part of this network, shape the digital future — and benefit from a sovereign data and service marketplace.

Author: CEO Arno Scheidereiter from neusta aerospace – Your partner for digitalisation and data spaces in the aeronautics and space sector. neusta aerospace is the project coordinator of COOPERANTS and the Trust Service Provider of ASD-X (GXDCH).

Date: June 2025

4.1.2 System-X

Cyber Resilient Industries: Leveraging Dataspaces to Build Cyber-Resilient European Industries

Reda Yaich, Head of Cybersecurity and Network at System-X

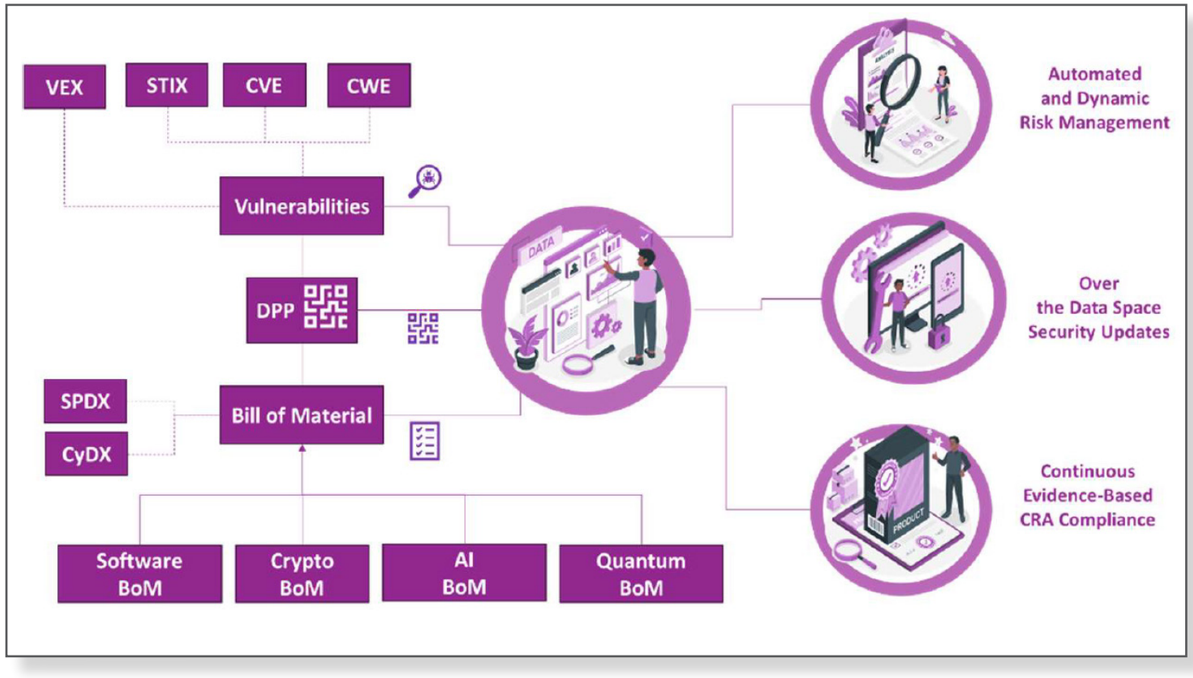
Recent analysis from the World Economic Forum Global Cybersecurity Outlook 2025 underlines how deeply cyber risk is now embedded in supply chains[1]. Fifty-four per cent of large organisations state that third-party risk management is their biggest barrier to cyber-resilience. CISOs report very limited visibility beyond tier-one suppliers and major difficulties enforcing security on third, fourth and N-th parties. The stakes were illustrated brutally by the 2024 incident where a single faulty software update triggered the largest IT outage in history, disrupting airlines, banks, hospitals and payment systems worldwide[2].

Despite this, cyber risk is still managed in a very local manner. Most organisations assess suppliers one by one, with no shared, live picture of component and supplier risk across ecosystems. Incidents and vulnerability data are generated, but rarely standardised or shared beyond bilateral relationships. Attention remains focused on large, visible providers, while a weak, under-resourced partner several hops away can still bring an entire chain to a halt.

The European regulatory agenda between now and 2030 will amplify these tensions. NIS2 requires essential and important entities to manage supply-chain cyber risk. The Cyber Resilience Act (CRA) introduces horizontal security and vulnerability-management obligations for products with digital elements, including reporting to ENISA and lifecycle responsibilities. The AI Act adds robustness and cybersecurity requirements for high-risk AI systems; many embedded in industrial products. The Data Act creates enforceable rights of access to data from connected products and services, providing the legal foundation for data sharing in value chains. These texts define what must be achieved, but not how cybersecurity evidence should be organised and shared across sectors.

The proposed **Cyber Resilient Industries dataspace** aims to provide that missing backbone. It builds on clear strengths: growing awareness of supply-chain risk, mature cyber-threat intelligence practices (e.g. CVE, CWE, STIX, VEX), an established Software Bill of Materials (SBOM) ecosystem (e.g. SPDX, CycloneDX), and existing EU and Gaia-X trust frameworks. At the same time, our initiative seeks to address current weaknesses of European industries such as fragmented evidence, manual reporting, misalignment between business, legal and technical stakeholders, and short-term cost pressures. If nothing changes, supply-chain shocks will intensify, sensitive technical details will remain difficult to share safely, and SMEs risk being left behind or becoming collateral damage when their suppliers fail to achieve CRA compliance. By federating cybersecurity-relevant data in a Gaia-X compliant dataspace, European industry can instead move towards prioritised and contextual risk views, early warning on supplier and product issues, more resilient supply-chain strategies, automated and reusable CRA evidence, faster and safer go-to-market, and demonstrable, competitive trust.

The necessity and urgency of this initiative is therefore clear. We now invite interested organisations to contact us and become founding members and early adopters of the Cyber Resilient Industries dataspace. By joining at this stage, you will help shape the initial governance model, prioritise the first concrete use cases, and participate in pilots that demonstrate value for real products and real supply chains. Our ambition is to co-design this dataspace with manufacturers, operators, solution providers and public authorities who are ready to move from discussion to implementation, and to turn a regulatory challenge into a collective advantage.



Conflict of interest

The author declares that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in the submitted work. The current submission presents original work attributed to the author and has not been previously published or sponsored to be published in any other publication other than the Gaia-X Magazine.

1 https://www.weforum.org/publications/global-cybersecurity-outlook-2025/

2 https://en.wikipedia.org/wiki/2024_CrowdStrike-related_IT_outages

4.1.3 Porto Digital

Porto Digital at the Gaia-X Summit: the city shaping the future of data ecosystems

Porto Digital

Porto reaffirmed its position as a European reference in digital innovation by hosting the Gaia-X Summit 2025 on the 20th and 21st of November. The choice of the city to welcome the event highlighted the maturity of its technological ecosystem and the established role of Porto Digital as a driving force behind urban digital transformation.

During the summit, Porto Digital played a central role by presenting the Traffic Flow Data Space (TFDS), a project developed in collaboration with European partners and the Municipal Mobility Department. The TFDS integrates data on traffic, roadworks, mobility patterns, and environmental indicators, demonstrating how federated digital infrastructures can optimise urban management, support more efficient public decision-making, and promote sustainable mobility solutions. The presentation provided clear evidence of Porto's contribution to advancing Data Spaces in Europe, applying the Gaia-X principles of digital sovereignty, interoperability, and trust.

Porto Digital's active presence across multiple sessions reinforced the vision of a city-laboratory, open to technological experimentation and the development of digital services oriented toward the public good. For the Municipality, the Summit represented a strategic opportunity to showcase Porto's ability to translate innovation into public value, turning digital policies into tangible improvements in the daily lives of citizens, businesses, and public services.

Held under the theme "Digital Ecosystems in Action", the Gaia-X Summit 2025 brought to Porto international experts, industry representatives, and policymakers, confirming the European relevance of the local ecosystem. Among the participants were Bernardo Correia, Portugal's Secretary of State for Digitalisation, and Rodrigo Passos, Councillor for Sports, Youth, and Digital Transition of the City of Porto, whose presence underscored the institutional significance of the event.

With a programme featuring strategic debates, technical workshops, and demonstrations of interoperable solutions, the Summit reinforced Porto as a place where some of Europe's most advanced practices in data governance and digital innovation are discussed, tested, and implemented.

By hosting the 2025 edition, Porto not only positioned itself as a leading European stage but also strengthened its commitment to continuing to lead transformative projects that promote public efficiency, economic development, and a smarter, more sustainable city.

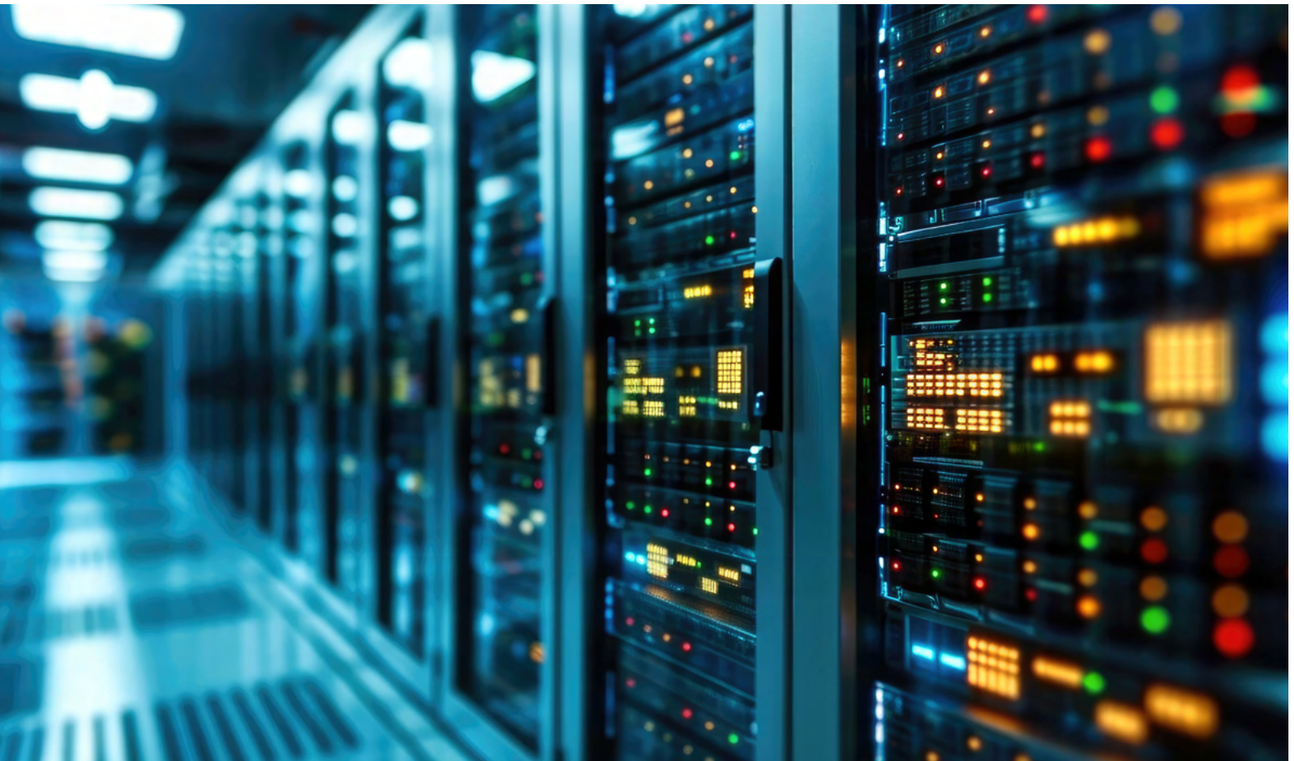
4.1.4 Cloud Temple

Europe’s digital sovereignty: when infrastructure becomes strategy

Sébastien Lescop, CEO of Cloud Temple

Europe is entering a decisive phase of its digital transformation. For years, discussions around sovereignty have been framed in political or regulatory terms. Yet the reality now confronting energy providers, industrial manufacturers, financial institutions, mobility operators and public services is far more concrete: digital infrastructure has become an essential layer of Europe’s industrial competitiveness — and Europe controls too little of it.

Roughly 70% of the continent’s cloud services are operated by non-European providers. This figure is often cited as an illustration of technological dependence. But its true meaning is industrial. It means that the core systems running power grids, factories, logistics chains, engineering platforms or national services operate atop frameworks governed by jurisdictions Europe cannot influence. In any other sector — energy, defence, transport — such an imbalance would trigger immediate corrective action. The cloud is no exception. It has simply matured faster than Europe’s capacity to govern it.



This is why the Gaia-X Label Level 3 certification marks more than an improvement in compliance. When Cloud Temple became the first provider to achieve this highest level of certification, the event signalled a shift: Europe is beginning to articulate a shared, verifiable definition of trust for the infrastructures on which its industries now depend.

From dependency to design: Europe’s structural challenge

Europe’s exposure is well documented. The Cloud Act and FISA allow foreign authorities to access European data regardless of its physical location. When access to the International Criminal Court’s digital environment was suspended under external pressure, the vulnerability stopped being theoretical. It entered the boardrooms of every CIO and CISO managing critical systems. The lesson is simple: sovereignty is not a slogan. It is an architecture.

Gaia-X Label Level 3 embodies this shift from narrative to design. It sets out what a trusted cloud must guarantee:

- integrity and security rooted in verifiable controls,
- transparency across the entire supply chain,
- interoperability that prevents lock-in and ensures continuity,
- independence from non-European jurisdictions.

For the first time, industrial users, technology providers and institutions can assess cloud infrastructures against the same standard. This does not create a new market — it clarifies the existing one.

Europe’s advantage is not scale, but system engineering

Europe cannot and does not need to mirror the hyperscaler model. Its strength lies in something different: the ability to engineer systems that balance performance, accountability and resilience. Three levers define this approach.

1. Open source as strategic infrastructure

Open-source technologies already power the core of the internet. They enable auditability, continuity and independence — characteristics essential to critical systems. Investing in open source is not a symbolic gesture; it is a rational industrial choice.

2. Interoperability across a 450-million-person market

Europe’s fragmentation is often portrayed as a weakness. It becomes a strength when infrastructures are designed to interoperate rather than centralise. Gaia-X provides precisely this connective architecture, enabling cloud and data ecosystems to function across borders with shared rules of engagement.

3. Regulation as a lever of competitive clarity

GDPR, DSA, DMA and the AI Act demonstrate Europe's ability to shape global norms. Gaia-X Level 3 translates these regulatory principles into concrete engineering requirements. Not as constraints, but as foundations of trust for organisations managing critical assets.

This model is not defensive.

It is differentiated — and increasingly relevant in a world where resilience, reversibility and transparency carry as much strategic value as capacity and scale.

The next move belongs to industry

At the Gaia-X Summit in Porto, leaders from aerospace, automotive, energy, finance, defence and healthcare expressed a similar view: the European cloud ecosystem does not lack capability. It lacks clarity. Industrial actors require a framework that allows them to evaluate cloud services based on operational and regulatory alignment — not on marketing narratives or promises of scale.

Public institutions can set direction. They can create incentives. But the decisive shift will come from the investment choices of Europe's major industrial groups. Redirecting even a small share of the €250 billion currently spent outside Europe would generate significant economic value, strengthen local ecosystems and accelerate the emergence of a coherent European cloud industry. This is not protectionism. It is a rational adjustment of supply chains that have become essential to Europe's industrial resilience.

The choice ahead

With Gaia-X Label Level 3, Europe now has something it lacked: an operational definition of trust in the cloud, grounded in engineering rather than rhetoric. The question is no longer whether sovereignty is achievable. It is whether Europe will make deliberate use of the tools it has given itself.

Sovereignty is not a barrier. It is the capacity to choose — and to maintain control over the infrastructures that sustain a modern economy.

Cloud Temple's certification is not an endpoint. It is a demonstration that a European model for trusted cloud services is not only possible, but already emerging. The task ahead belongs to industry leaders, policymakers and technology providers alike.

Europe's digital future will not be defined by scale alone, but by the quality of the foundations it chooses to build upon. And those choices begin now.

05

COMMUNITY

The Gaia-X Community plays an instrumental role in shaping our organisation. This section celebrates and highlights the invaluable contributions made by Gaia-X Hubs, Lighthouses and Members and showcases their stories, expertise, and the remarkable impact they have had on our journey. We will explore their innovative solutions, industry insights, and the collaborative projects that have propelled us forward. As we embark on this exciting journey of showcasing our community, we extend our heartfelt appreciation to every one of them. Their dedication, expertise, and unwavering belief in our shared goals have been instrumental in propelling us towards greater heights.

Members Stories
Hub Highlights
Lighthouse Updates

05

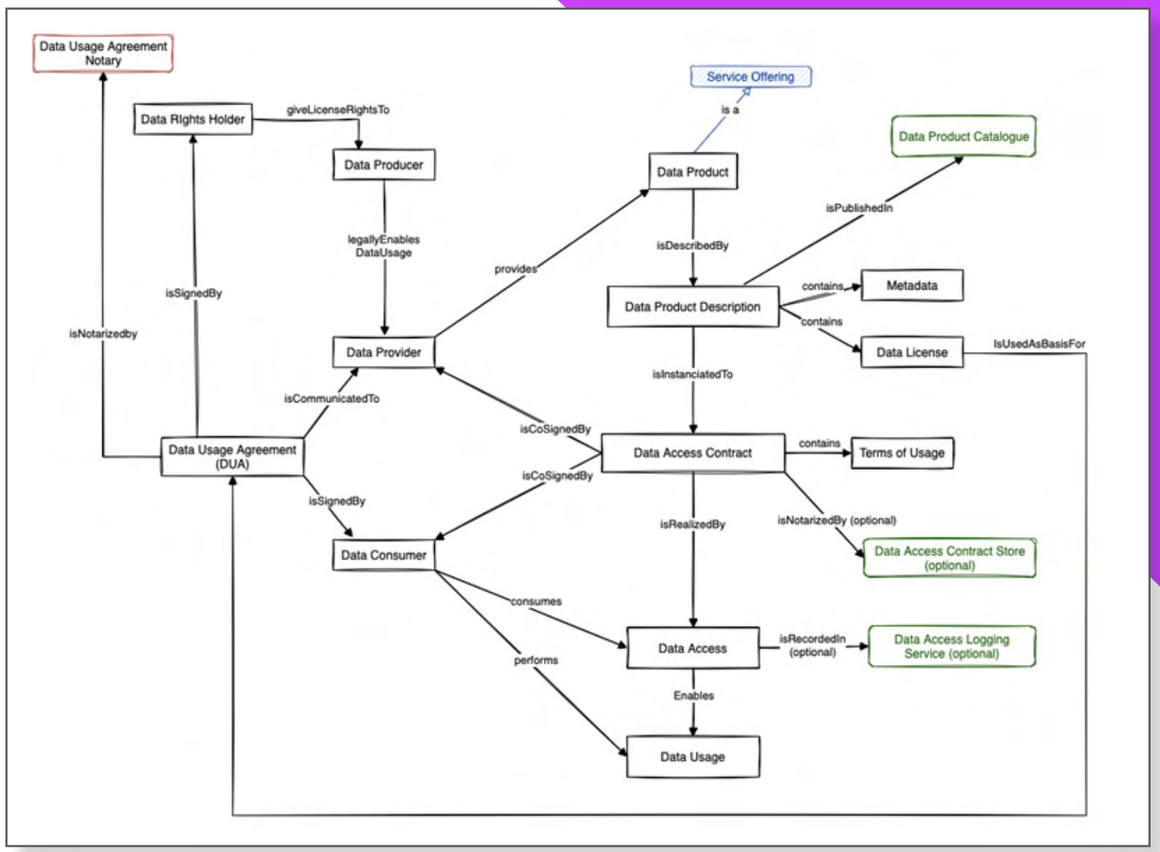
5.1.1 Dawex

Data Exchange Services -Updates and Roadmap

Frederic Bellaiche, PhD, Vice President Technology & Research at Dawex, and Lead of the Data Exchange Services Working Group

The Gaia-X Data Exchange Services Working Group (DEX) has been engaged in a substantial collective effort for over a year, driving the formalisation of Trusted Data Transactions within the Gaia-X ecosystem. The primary objective is to create a robust framework where Data Rights Holders maintain control, ensuring trust, accountability, and transparency in data exchange.

The result of this work is reflected in the release of **Data Exchange Services Document 25.07**, a non-breaking update to the Gaia-X specifications. This document represents a crucial step in aligning the specifications with broader international standardisation efforts, particularly those initiated by the CEN Workshop on Trusted Data Transaction and the JTC 25 technical committee focused on Data management, Data Spaces, Cloud, and Edge technologies. This alignment is key to ensuring **interoperability** and broad **industry adoption**.



Key achievements formalised in the 25.07 update include:

- **Refinement of Core Components**: The Working Group provided the first round of substantial updates on the description of the **Data Products Catalog** and **Data Access Logging**. These elements are fundamental to discoverability and auditability within a data space.
- **Data Product Conceptual Model**: A significant part of the work involved updating the Data Product Conceptual Model. This update ensures alignment with the Architecture Working Group (Architecture WG) and the Identity and Access Management Working Group (ICAM WG), explicitly incorporating the concept of **Trusted Data Transactions** into the model's core.
- **Introduction of the Data Usage Agreement (DUA)**: The DUA is one of the most critical introductions, enabling Data Rights Holders to precisely control by whom, how, and when their data is used. It grants the Data Consumer formal, specified authorisation. The 25.07 document details the DUA protocol, including its structure, life cycle, and primitives, formalising a vital mechanism for enforcing data policies.
- **Ontologies as Single Source of Truth**: Work has been completed to update the Gaia-X Ontologies related to Data Exchange, establishing them as a single source of truth to ensure semantic consistency across the Data Space specifications.

These elements collectively lay the foundation for a **governed, secure, and trustworthy framework for data exchange**, addressing the complex legal, technical, and business requirements of **modern data ecosystems**.

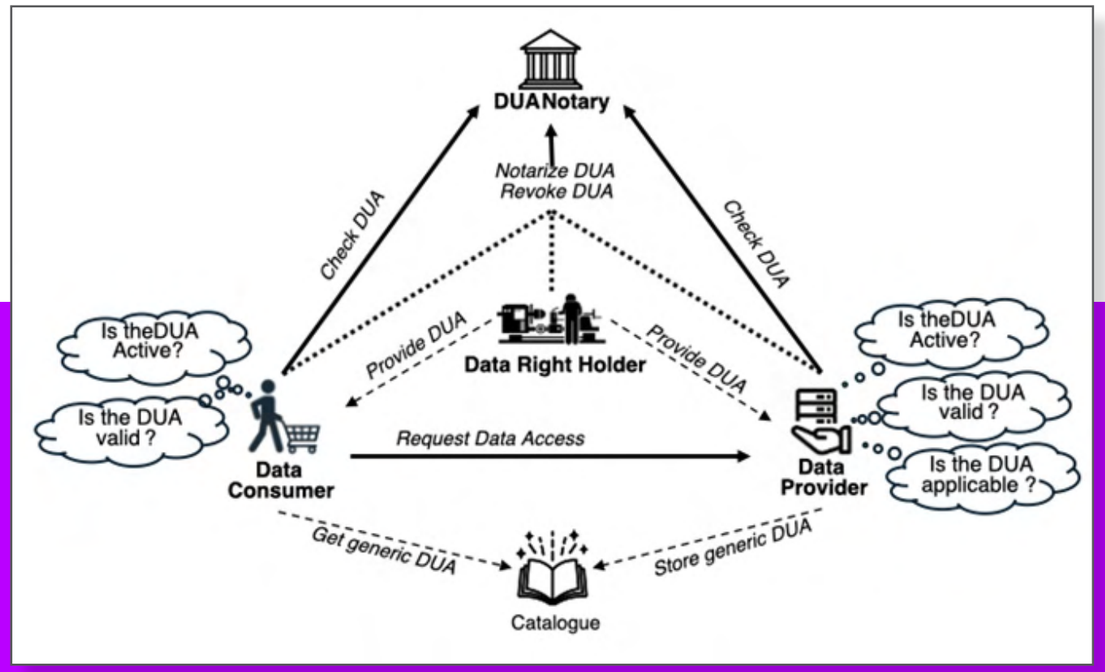
The 2026 roadmap is focused on integrating the outcomes of the ongoing standardisation efforts, particularly those from the Trusted Data Transaction/JTC 25 committees. The next release will be centered on elevating the formalisation of key concepts:

1. **Data Transaction**: The Working Group will work to formally integrate and define the **Data Transaction** within the Gaia-X conceptual model, moving from a general concept to a strictly specified technical primitive.

2. **Observability**: There will be comprehensive updates to the **Data Observability** chapter. A dedicated sprint on Data Observability has already been initiated to accelerate this work.

3. **Formalising Participant Roles**: The conceptual model will be extended to formalise the roles of all participants — such as the **Data Consumer, Data Producer, and Orchestrator** — through the specification of party credentials that were introduced recently into the ICAM document.

Ultimately, the Data Exchange Services roadmap is driven by the recognition that **identity management, digital wallets, and data transfer agents** are the **essential pillars** for establishing the required levels of trust, accountability, and transparency in the future of the Data Exchange Services framework. This forward-looking work will solidify the Gaia-X framework as the premier solution for trusted data transactions.



5.1.2 EIT Manufacturing

Participants training to support onboarding in data spaces

Johannes Hunschofsky, Managing Director; **Dr. Wolfgang Kniejski**, Senior Project Manager & **Lukas Schwab**, Project & Communication Associate at EIT Manufacturing East

EIT Manufacturing is a public-private partnership founded in 2019 to strengthen the competitiveness of Europe's manufacturing sector. As part of its digital transformation mission, EIT Manufacturing supports industrial stakeholders in adopting Gaia-X-compliant data-sharing concepts, including previous participation in the Gaia-X lighthouse initiative "EuProGigant."

Data sharing has become essential for global competitiveness in a digitalised manufacturing environment, enabling higher productivity, improved quality and greater innovation across value chains. Effective data cooperation requires both managers and employees to understand the economic advantages and incentives associated with sharing and using data. Education and training therefore play a central role in developing the necessary skills, raising awareness, and fostering collaboration across companies and borders. To encourage especially small and medium-sized manufacturers to join emerging data-sharing ecosystems, EIT Manufacturing East is involved in the newly-launched ERASMUS+ funded project "VET4DATACOOPERATION."

This project focuses on creating innovative, interactive training resources that prepare participants to engage confidently and responsibly with digital tools. Real-world scenarios, practical cross-company use cases, and tailored workshops help translate abstract data-sharing concepts into concrete operational benefits. By developing high-quality training content and distributing learning modules through established platforms, the project also boosts digital readiness by offering accessible, self-paced learning opportunities. These resources help companies to recognise economic potential, overcome adoption barriers and participate more effectively in data-driven collaboration.

Through these efforts, EIT Manufacturing East contributes to a broader ambition: strengthening society's long-term ability to adapt to and thrive in an increasingly digital industrial landscape.

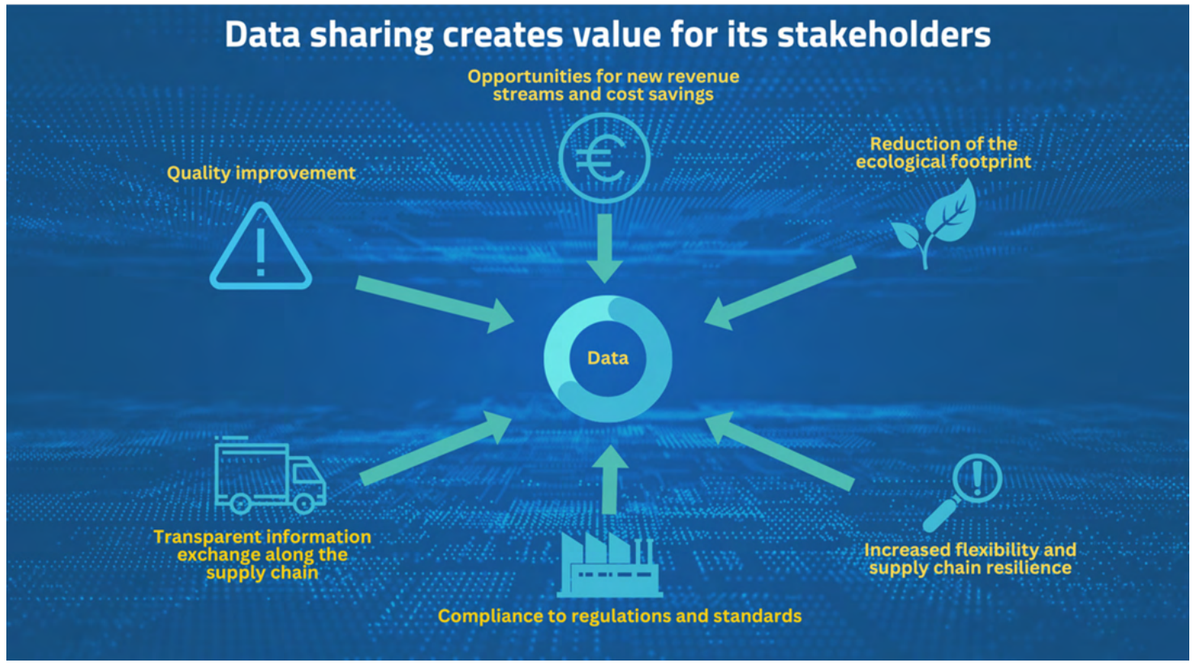


Figure 1: Data sharing creates values for its stakeholders; Source: EIT Manufacturing East GmbH©

Figure 2: Data sharing success factors; Source: EIT Manufacturing East GmbH©

Johannes Hunschofsky:

Managing Director at EIT Manufacturing East

Wolfgang Kniejski:

Senior Project Manager at EIT Manufacturing East

Lukas Schwab:

Project & Communication Associate at EIT Manufacturing East

5.1.3 Yinovise

From Data Chaos to Trusted Intelligence

How Human-in-the-Loop AI and Gaia-X Data Spaces Are Shaping Europe's Digital Future

Blessey Didla, Co Founder, & **Yige Huang**, CEO & Co-founder of Yinovise

Europe stands at a critical crossroads. As artificial intelligence fundamentally reshapes industries and data emerges as the essential currency of innovation, the question of who controls data and how it is deployed has become more pressing than ever. Gaia-X, the European initiative for federated and sovereign data infrastructure, is positioning itself as a cornerstone of this digital transformation. Simultaneously, the emergence of human-in-the-loop AI provides a powerful pathway to merge automation with accountability, guaranteeing that insights extracted from sensitive data remain dependable, ethical, and compliant with regulatory standards.

Digital Sovereignty as a Strategic Imperative

For generations, European organisations have depended substantially on non-EU platforms for cloud services, analytics, and AI capabilities. Although these platforms delivered impressive scalability, they also established dependencies that threatened European sovereignty. Gaia-X tackles this challenge by constructing federated data environments where businesses, public sector organisations, and academic institutions can participate in data exchange and collaboration while preserving complete control over their information.

Why Sovereignty Matters

Digital sovereignty transcends mere regulatory adherence — it represents a competitive advantage. Across healthcare, manufacturing, and financial services, institutions capable of safely harnessing collective data will accelerate innovation and address societal challenges with greater effectiveness.

AI Meets Human Oversight

Artificial intelligence, particularly large language models (LLMs) and natural language processing (NLP) technologies, are fundamentally transforming organisational approaches to processing unstructured information. Business reports, customer relationship management notes, user feedback documents, and scientific publications can now be automatically categorised, grouped, and processed at unprecedented scale.

"Trust cannot be automated. In healthcare and life sciences, human-in-the-loop validation ensures AI outputs are technically accurate, medically sound, and ethically appropriate."

This integrated methodology — combining computational efficiency with expert validation — provides the foundation for conscientious AI implementation. By incorporating human verification into AI processing pipelines, institutions can fulfill GDPR compliance obligations, ensure operational transparency, and establish credibility with all stakeholders.

Data Spaces as Innovation Engines

Data spaces implementing Gaia-X concepts function as far more than mere technical infrastructure — they represent true innovation engines. By facilitating secure, distributed teamwork, they enable numerous organisations to supply data resources without surrendering ownership rights.

Medical Insights Platform Prototype

- Unstructured information from CRM platforms, SharePoint repositories, and documents undergoes anonymization and systematic organisation into standardised frameworks
- AI technology categorises and organises insights, with medical specialists performing validation of results
- Visual dashboards and management summaries translate raw information into practical, implementable intelligence

Governance and Compliance as Differentiators

In the modern age of AI advancement, governance functions as far more than an administrative requirement — it emerges as a genuine competitive advantage. Enterprises that incorporate procedure-driven quality assurance, systematic tracking of AI iterations, and comprehensive audit capabilities into their operational frameworks will find themselves more prepared for growth and market expansion.

Gaia-X's commitment to establishing robust trust infrastructure guarantees that regulatory compliance becomes inherent to the whole ecosystem. This commitment proves especially vital in medical and pharmaceutical sectors, where patient protection and methodological rigor are fundamental requirements. By integrating AI advancement with strong governance practices, Europe establishes itself as a worldwide leader in constructing secure and accountable technology systems.

The Road Ahead: Federated AI Ecosystems

The intersection of Gaia-X data infrastructure and AI innovation establishes the foundation for distributed AI systems. These next-generation environments will permit emerging companies, smaller enterprises, and governmental bodies to connect with shared technological platforms, obtaining sophisticated AI resources while preserving data autonomy.

Expected Developments by 2026

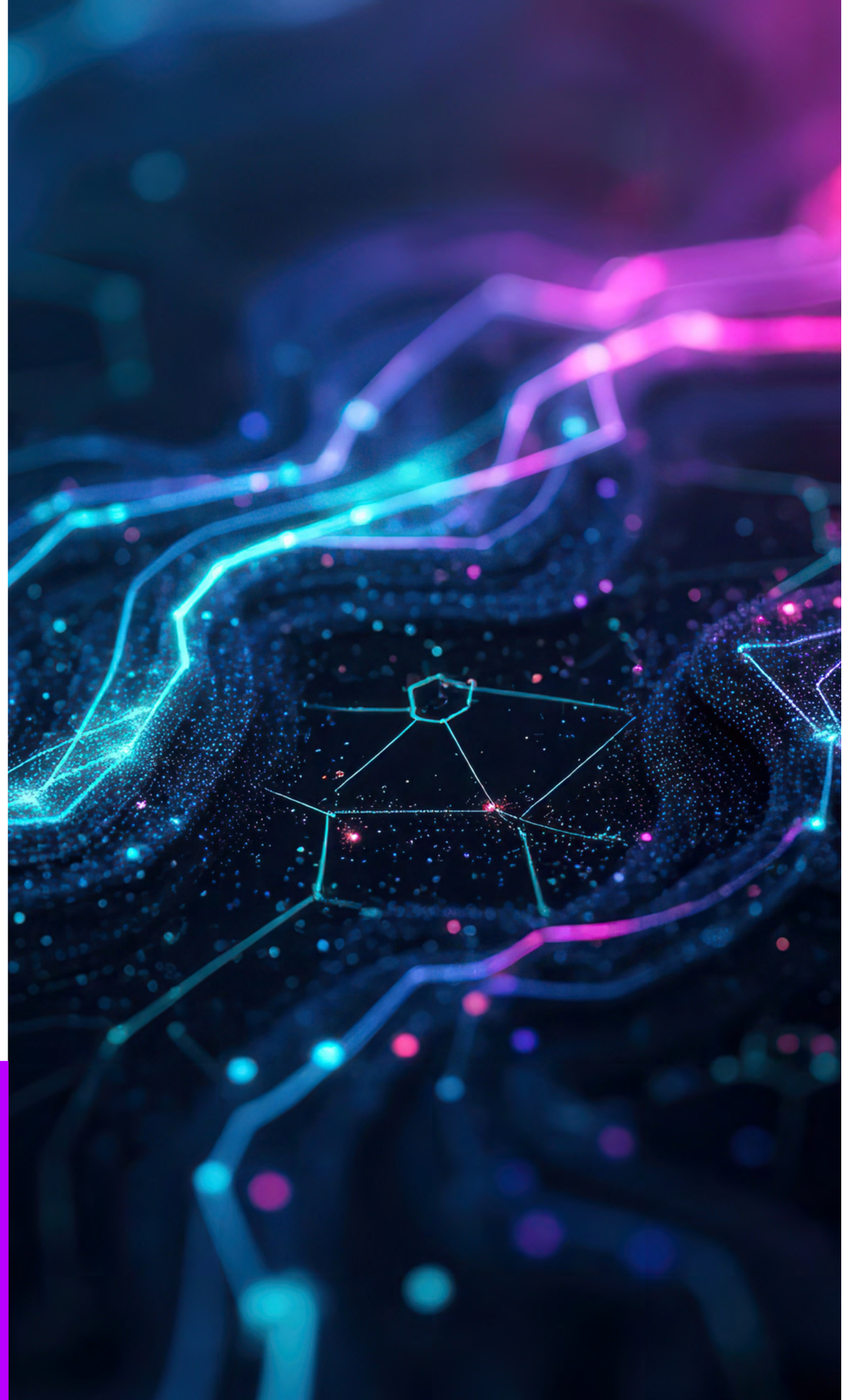
- Multi-industry SaaS solutions leveraging Gaia-X frameworks enabling secure cross-sector teamwork
- Industry-focused data infrastructures in areas like medical care, industrial production, and power generation spurring advancement through collective knowledge
- Human-supervised AI procedures transforming into standard practice across regulated business sectors

This trajectory does not represent the substitution of human knowledge with computational systems — rather, it signifies the expansion of human decision-making processes through validated, trustworthy information resources.

Conclusion

Europe's digital future hinges on its capacity to convert information into dependable intelligence. Gaia-X supplies the technical framework, while supervised AI mechanisms guarantee mechanised systems maintain responsibility and ethics.

Together, they represent an extraordinary opportunity: an independent, cooperative, and ethical technology infrastructure where creative advancement flourishes without sacrificing moral standards or regulatory requirements. As we approach 2026, the roadmap is evident — and so is the potential. Through the adoption of Gaia-X frameworks and conscientious machine learning practices, Europe has the opportunity to establish international benchmarks for technology systems that are simultaneously sophisticated and principled.



5.1.4 AMIDS

Valuable learnings from ResearchLin-X for the next steps

Roman Gehrer, Research Associate at TU Wien; **Lukas Schwab**, Project and Communication Associate at EIT Manufacturing East

AMIDS (Austrian Manufacturing and Innovation Data Space) was launched in 2023 and builds on two complementary research projects: In ResearchLin-X, the foundations of a dataspace in the manufacturing industry are developed. PilotLin-X adopts these results and makes them accessible, particularly to small and medium companies (SMEs). Together, they pursue the mission of exploring new data space technologies and translating them into practical applications. At its core, AMIDS aims to establish a functional Austrian data space aligned with Gaia-X standards that can serve as a testbed for the Austrian industry. To achieve this, the projects unite Austria's leading pilot factories – the Pilotfabrik „Industrie 4.0" of TU Wien, the JKU LIT Factory, and smartfactory@tugraz – creating a strong network to accelerate digitalisation across the manufacturing sector.

Learnings from Research Lin-X

Key results of ResearchLin-X include assessing the requirements for data spaces as well as solutions for major pain points of their implementations for SMEs that often do not have dedicated resources to operate their data space connection by themselves. Using the Living Lab technology of T-Systems, the project partners attempted a solution that implants data space components as a service. Although, there is still further research needed to advance to technology readiness levels towards an industrial usage.

What´s next?

As ResearchLin-X reaches maturity at the end of 2025, its insights will be carried forward into new initiatives. PilotLin-X will directly benefit by applying the research results to practice, ensuring that theoretical advances are transformed into tangible solutions.

In parallel, the new project MetaLin-X, involving the same core partners, is set to begin in early 2026. This initiative will further advance the implementation of Gaia-X principles within Austria's pilot factories, reinforcing their role as frontrunners in shaping Europe's manufacturing data spaces.

Figure 1: AMIDS project logo

Figure 2: The ResearchLin-X consortium

5.1.5 Sigma Software

From Data Spaces to Sovereign Feature Stores: A Pragmatic Path to AI in European Banking

From Gaia-X to Impact: Fighting Financial Scams with Sovereign AI

Genady Chybranov, Competence Leader, BFSI at Sigma Software

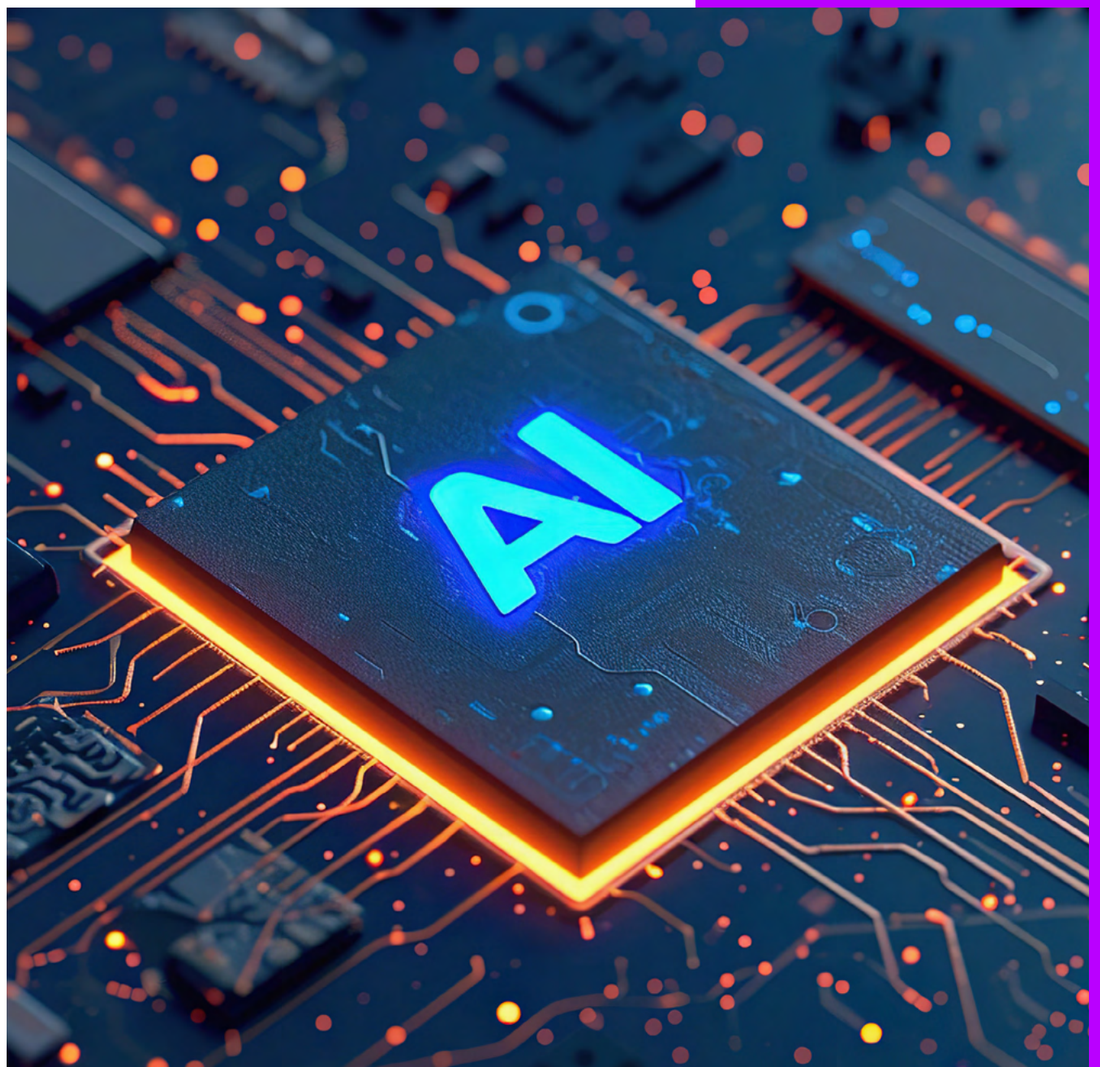
European banking is at a turning point. With regulations like the EU AI Act and DORA, compliance, traceability, and data sovereignty are now foundational. Gaia-X was launched to ensure secure, sovereign data exchange and service interactions across multiple providers. Banks can now move from policy to practice with the Sovereign Feature Store.

A pressing use case is fraud detection. Social-engineering scams cost Europeans €4 billion last year. These attacks use legitimate credentials, making them hard to detect with models trained on isolated data. Banks can't share raw data due to GDPR and secrecy laws.

A Sovereign Feature Store enables banks to share fraud-related intelligence—such as vectors of attack, transaction velocity, or device fingerprints—without exposing private data. Sensitive information remains under each bank's control. Shared signals are exchanged securely via data contracts, ensuring purpose-bound use and full traceability. Banks use federated learning to train models collectively, sharing only model weights while keeping raw data segregated. When a suspicious transaction occurs, the model queries cross-bank signals. If the combined risk exceeds a threshold, the transaction is flagged—in a fast, secure, and compliant manner.

This approach delivers collective intelligence without compromising privacy. Every inference is logged, auditable, and explainable—meeting regulatory standards while enhancing fraud detection.

Now is the time to be opportunistic and bold. Projects like Safe FBDC prove that industry-wide challenges can be solved collaboratively. The Sovereign Feature Store offers a practical starting point. Gaia-X lays the foundation; the tools are ready. Will you lead or follow?



5.1.6 Sigma Software

Becoming Customer Zero: A Journey to Scalable Data Products

Anatoliy Kochetov, Chief Operations Officer at Sigma Software

Data is everywhere, but its value isn't guaranteed. Like many IT leaders, we faced scattered analytics, rising storage costs, and unclear ROI. So, how did we fix it?

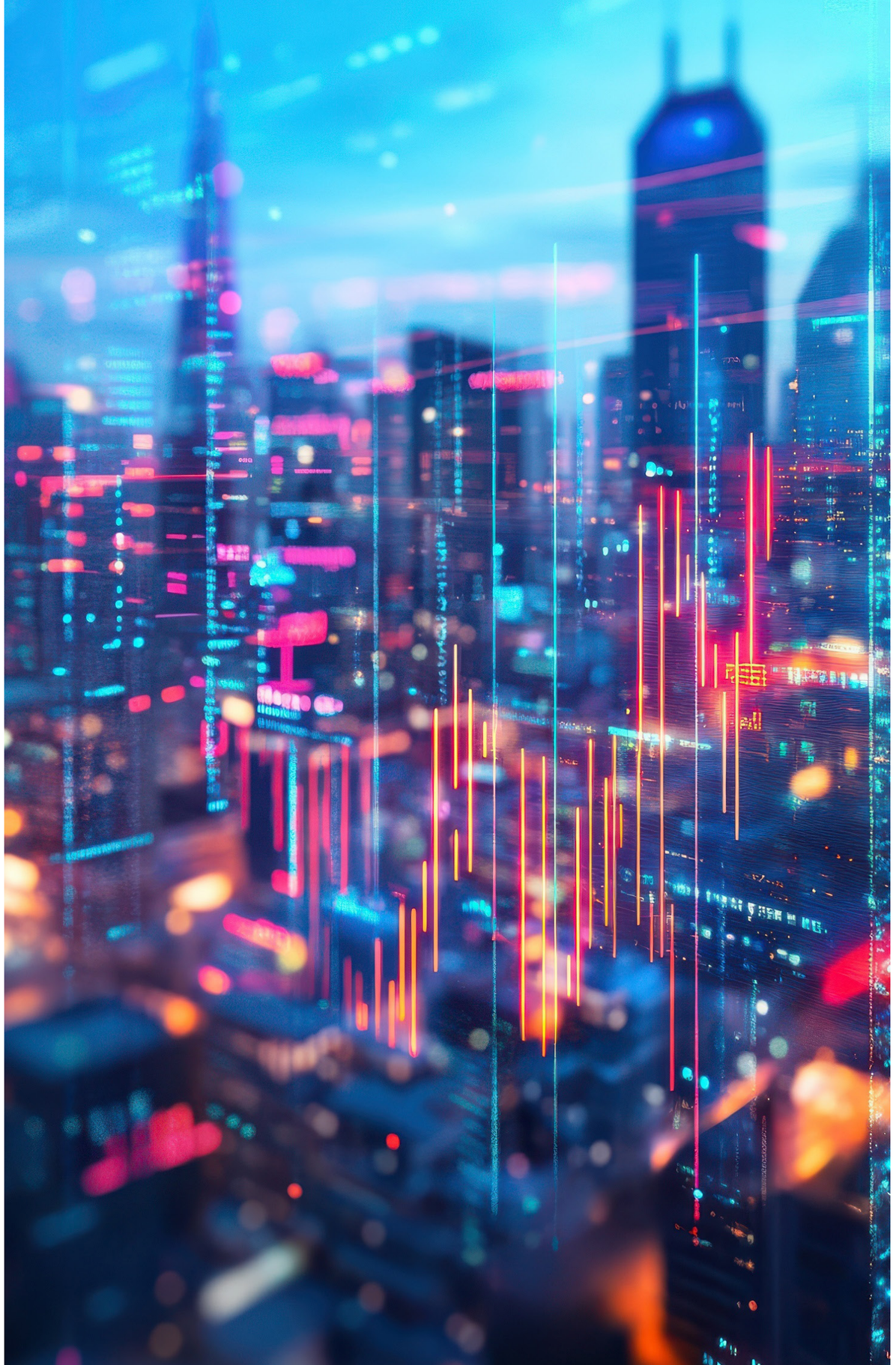
Sigma Software launched its Data Center of Excellence (CoE) over 15 years ago, based on the Customer Zero concept: every product or service we offer must first prove its value internally. This approach enables us to embody Gaia-X values — transparency, sovereignty, security, and interoperability — by validating them within our own ecosystem before offering solutions externally.

After years of perfection, our Data CoE has shaped the following internal best practice that became our professional offering.

Key Best Practices from Sigma Software's Data CoE:

- **Start with Value**: Secure stakeholder buy-in and embed business case thinking across the organisation through training and cultural change.
- **Design for Impact**: Use Design Thinking to align data models with real business processes and iterate quickly with cost-effective PoCs using open-source tools.
- **Build Trust Visually**: Focus on intuitive, high-quality data visualisations to drive early adoption, even before the backend is fully mature.
- **Establish Lean Governance**: Begin with a dedicated Data Architect and grow governance organically, without over-engineering.
- **Empower and Monetise**: Enable self-service analytics through Data Marts and permissions, explore internal billing and external data monetisation strategies.

Through this approach, we have transformed internal innovation into real-world data solutions that reduce costs, generate revenue, and unlock business insights – **helping our clients turn their data from a cost center into a scalable model that powers competitive advantage**.



5.1.7 Dawex

Essential Pillars for Trusted Data Transactions

Frederic Bellaiche, PhD, Vice President Technology & Research at Dawex, and Lead of the Data Exchange Services Working Group

The vision for a **sovereign, trusted European data infrastructure**, as championed by Gaia-X, rests upon the meticulous engineering of secure, auditable interactions between participants.

At the heart of this framework are **three synergistic pillars**—Identity Management, Digital Wallets, and Participant Agents—which collectively establish the necessary layers of **trust**, **accountability**, and **transparency for data transactions**.

Identity is the foundational layer of any trusted ecosystem. In Gaia-X, this is managed through **Verifiable Credentials (VCs)**, a decentralized, cryptographic mechanism designed to secure the roles and attributes of all participants, including the **User**, **Organisation**, **Data Provider**, and **Data Consumer**.

The use of participant VCs injects transparency into the who of the transaction. Every claim about a participant's identity or compliance is a piece of transparent, verifiable data. Furthermore VCs are used for the data product itself. This credential acts as a verifiable metadata wrapper for the data product, establishing conditions of use, which is crucial for a transparent marketplace.

The **Wallet** is the secure operational component that binds **identity management** to **accountability** within the data space.

The Wallet serves as a highly secure storage location for all VCs that define a participant's capabilities and permissions. The Digital Wallet is therefore not just storage; it is the active tool that enforces the accountability established by the VCs during every phase of the Trusted Data Transaction.

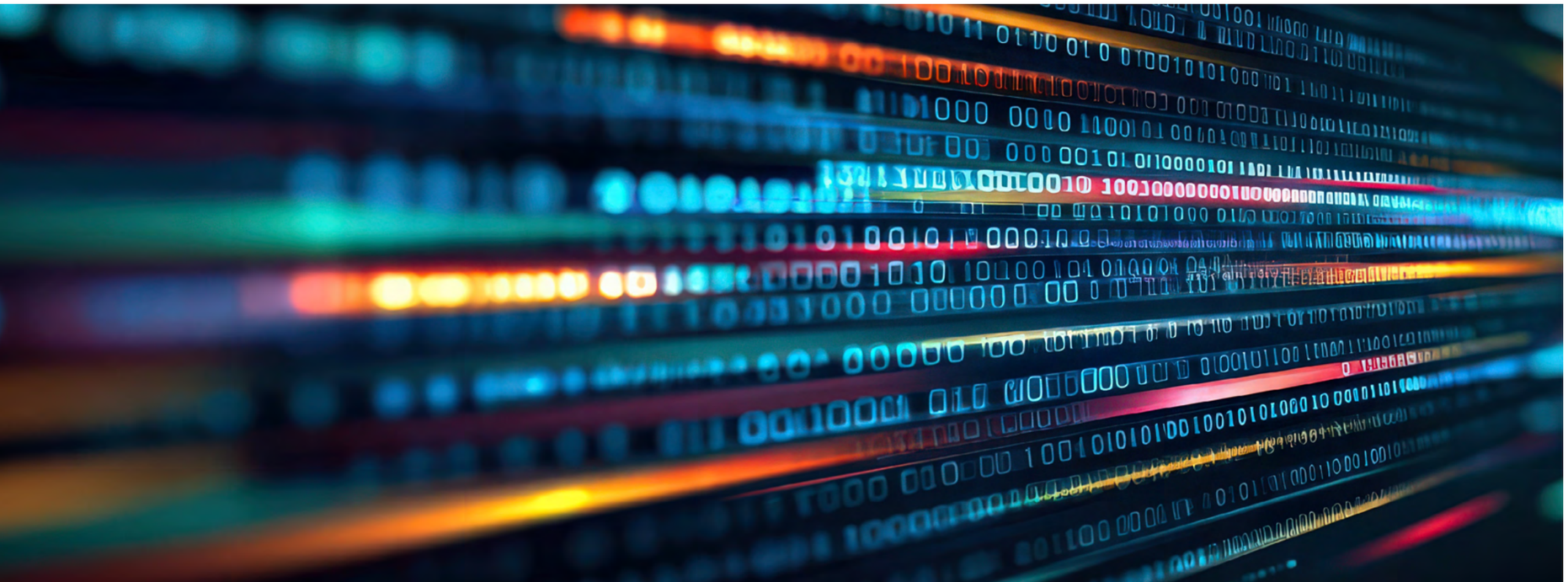
The **Participant Agents** are the technical executor of the transaction, bridging the gap between authenticated identity and the actual data flow. They are positioned between the Data Provider and the Data Consumer, ensuring secure and policy-compliant execution.

Their primary function is to enforce the terms of the data agreement: policy enforcement, secure transfer and accountability.

The full architecture of Trusted Data Transactions is realised when these three pillars interact seamlessly, coordinated by the **Gaia-X Digital Clearing House**.

In summary, the identity management system provides the *verifiable identity*, the digital wallet provides the *secure proof of claims*, and the data transfer agent provides the *compliant execution*.

All of these pillars are **necessary to fulfill** the promise of a fully trusted, accountable, and transparent data transaction—the fundamental goal of the Gaia-X Data Exchange Services Working Group.



5.2.1 Hub Germany

Expanded Learning Opportunities for Data Sovereignty

Gaia-X Campus: New Courses Advance Data Skills

Manuel Krieg, Press & Communications Officer at Gaia-X Hub Germany

Press release first published on 6 November, 2025

Empowering Level-Playing-Field Data Exchange: Data spaces are the bedrock of Europe's digital sovereignty. Yet, as a young technology, their potential and requirements present new challenges for many professionals and decision-makers. The Gaia-X Campus provides hands-on training that delivers the essential technical and organisational understanding required, accessible to all interested parties. With the addition of Modules 2 and 3, the learning platform now deepens its focus on data space architectures and industry-specific applications—enabling business developers, project managers, and IT leaders to confidently launch and steer their own data space projects.

Data spaces are pivotal for advancing Europe's digital sovereignty. They offer secure, controlled, and interoperable data usage across organisational and national boundaries—yet widespread implementation is still in its infancy. The Gaia-X Campus, launched by Gaia-X Hub Germany, is a practice-oriented learning platform that empowers professionals and leaders to plan and deliver data-driven projects with confidence. The new modules 2 and 3 expand technical know-how and use up-to-date application scenarios to illustrate how data spaces function from both business and legal perspectives.

Background: Shaping Tomorrow with Data Spaces

The European Commission actively supports the development of shared data spaces—in sectors such as mobility, healthcare, industry, and energy—funding numerous pilot projects that put technical and organisational concepts to the test. Gaia-X is driving the creation of a secure, federated standard for data infrastructures. These efforts, supported by new regulatory frameworks like the EU Data Act and the European Health Data Space Regulation, are enhancing trust and transparency within Europe's data ecosystem.

Data Space Architecture Made Accessible

Course 2 delivers fundamental building blocks for sovereign data spaces: secure connectors, verifiable identities, federated catalogues for data discoverability, and machine-readable terms of use for automated governance. Participants learn how these elements interact to build a federated, secure, and scalable data space ecosystem. The course covers how data can remain at its source while access rights and permissions are managed centrally and monitored automatically. This approach helps learners make informed architecture decisions and confidently implement projects.

Real-World Use Cases: Added Value and Practical Perspectives

Course 3 features real-world examples, including:

- **Healthcare**: The HEALTH-X dataLOFT project connects institutions such as Charité Berlin, Fraunhofer ISST, and Siemens Healthineers, enabling secure and GDPR-compliant sharing of sensitive health data for research and innovation. Patients use an app to voluntarily manage their data sharing, thereby fostering new therapies and digital health services.

- **Industry**: The European project EuProGigant brings together research and industry partners like TU Vienna, TU Darmstadt, concircle, and Voestalpine. By making the carbon footprint transparent during product development and creating more efficient production processes through secure data spaces, it sets a precedent for sustainable industry practices.

- **Energy**: The energy data-X project, with partners such as TenneT, Fraunhofer IOSB-AST, and Amprion, is building a decentralised data space for energy providers, storage, and flexibility operators. It enables real-time management of electricity flows from renewable sources, ensuring grid stability in an increasingly decentralised energy system.

These practical examples offer orientation and inspiration for business developers, project managers, and IT leaders seeking to develop and scale their own data space-driven initiatives.

Gaia-X Campus: Solid Data Skills for a Sovereign Digital Economy

The Gaia-X Campus offers a free, modular learning programme in both German and English, providing comprehensive insights into the technical, legal, and practical aspects of data spaces. By combining modules 1 through 3, learners gain holistic data skills allowing them to confidently plan, implement, and manage data space-enabled projects.

Further information and campus access: https://gaia-x-hub.de/campus-2

About Gaia-X Hub Germany

Since its founding in 2020, Gaia-X Hub Germany has been the go-to point of contact for anyone interested in data exchange within open data ecosystems. The hub's mission: support the development of an international data economy that reflects European values and economic structures. Gaia-X Hub fosters the development and uptake of Gaia-X in Germany, bringing together representatives from the academic, business, policy, and civil society sectors to share experiences, generate insights, and jointly put theory into practice. Beyond the German Gaia-X Hub, there are currently 19 other national hubs within the EU and seven outside Europe.

Press contact

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5.2.2 Hub Germany

Gaia-X data spaces for municipalities and regions: Joint position paper as a guide to practical application by the Smart City / Smart Region, Public Sector and Energy Domains

How three Gaia-X domains have developed a practical tool for sovereign municipal data spaces

Winnie Schöngut, Scientific Officer, Domain Lead Smart City/Smart Region at Gaia-X Hub Germany

Why do municipalities need data spaces?

Municipalities today face the challenge to organise climate protection, mobility, energy supply, and public services in a data-driven, networked, and legally compliant way – often across administrative and sectoral boundaries. However, this requires a secure data infrastructure such as data spaces. For this reason, the Gaia-X domains Smart City / Smart Region, Public Sector, and Energy have jointly developed the position paper "Gaia-X Data Spaces for Municipalities and Regions – Foundations, Opportunities, and Practical Insights." It brings together perspectives from administration, the energy sector, research, and municipal practice and shows how municipal data spaces can be established and operated according to Gaia-X principles.

Thinking across domains: Three perspectives, one position paper

At the heart of the paper is the need for sovereign, federated data spaces that go beyond traditional municipal data platforms. While platforms typically collect data centrally, the authors understand data spaces as open infrastructures for secure data exchange between many stakeholders, based on shared rules, standards, and governance structures. The paper also contextualises key European and national legislation – from the General Data Protection Regulation and the Data Governance Act to the Data Act, the Open Data Directive, and the German Data Use Act – and illustrates how data spaces can help implement these requirements in municipal practice. This gives municipalities both a conceptual foundation and guidance on operating models, legal frameworks, data sovereignty, and interoperability.

The Data Space Canvas: A tool for municipal data spaces

A particular highlight of the paper is the "Data Space Canvas", developed by the German domains Smart City / Smart Region and Public Sector as a strategic tool to help design operating models for municipal data spaces. It builds on the "Digital Platform Canvas" of the Institute for Innovation and Technology and applies its logic to data spaces, which are understood as multi-sided platforms with numerous stakeholders. The canvas is divided into four key blocks – promised impact, operator, governance, and sustainability – plus a cross-cutting block for strategies. It enables municipalities and partners to structure complex requirements and translate them into concrete next steps.

Four blocks, one common language: Structure of the Data Space Canvas

The Data Space Canvas can be used in different project phases: to structure and develop initial ideas for an operating model, or to critically review and refine existing models. It supports a shared understanding of the added value a planned data space can create, which actors will assume which roles, rules and processes to apply, and the social, economic, and environmental sustainability which need to be considered. Typical guiding questions include: Who benefits from the data space, what basic services are needed, how is governance designed in a participatory way, and how can positive impacts on society, the economy, and the environment be demonstrated?

In practice: Oldenburg and energy data-X

The position paper introduces examples of how the Data Space Canvas works in practice. The city of Oldenburg used the canvas in a workshop to examine its planned municipal sustainability monitoring and city-wide data management from a data space perspective and to build a shared understanding between administration, IT, and other stakeholders. In the project "energy data-X", the canvas helps to structure the "FleX" use case – a cross-sectoral flexibility management approach in the energy system

that coordinates generation and consumption in real time and connects municipal, commercial, and private actors.

Next steps for municipalities and partners

The Data Space Canvas is available as a freely accessible template under a Creative Commons license on the Gaia-X Hub Germany website and can be used directly in municipal or regional projects. The position paper invites municipalities, public companies, and their partners to see data spaces as a building block of sovereign, networked, and sustainable governance – and to plan their own path toward this goal in a structured manner. Readers of the Gaia-X AISBL Magazine are invited to explore the position paper, use the canvas in their projects, and connect with the participating Gaia-X domains and further develop data-driven innovation in municipalities and regions together.

You can find the position paper and the Data Space Canvas here:

https://gaia-x-hub.de/en/position-paper/gaia-x-data-spaces-for-municipalities-and-regions-fundamentals-opportunities-and-practical-insights/

For further information please contact:

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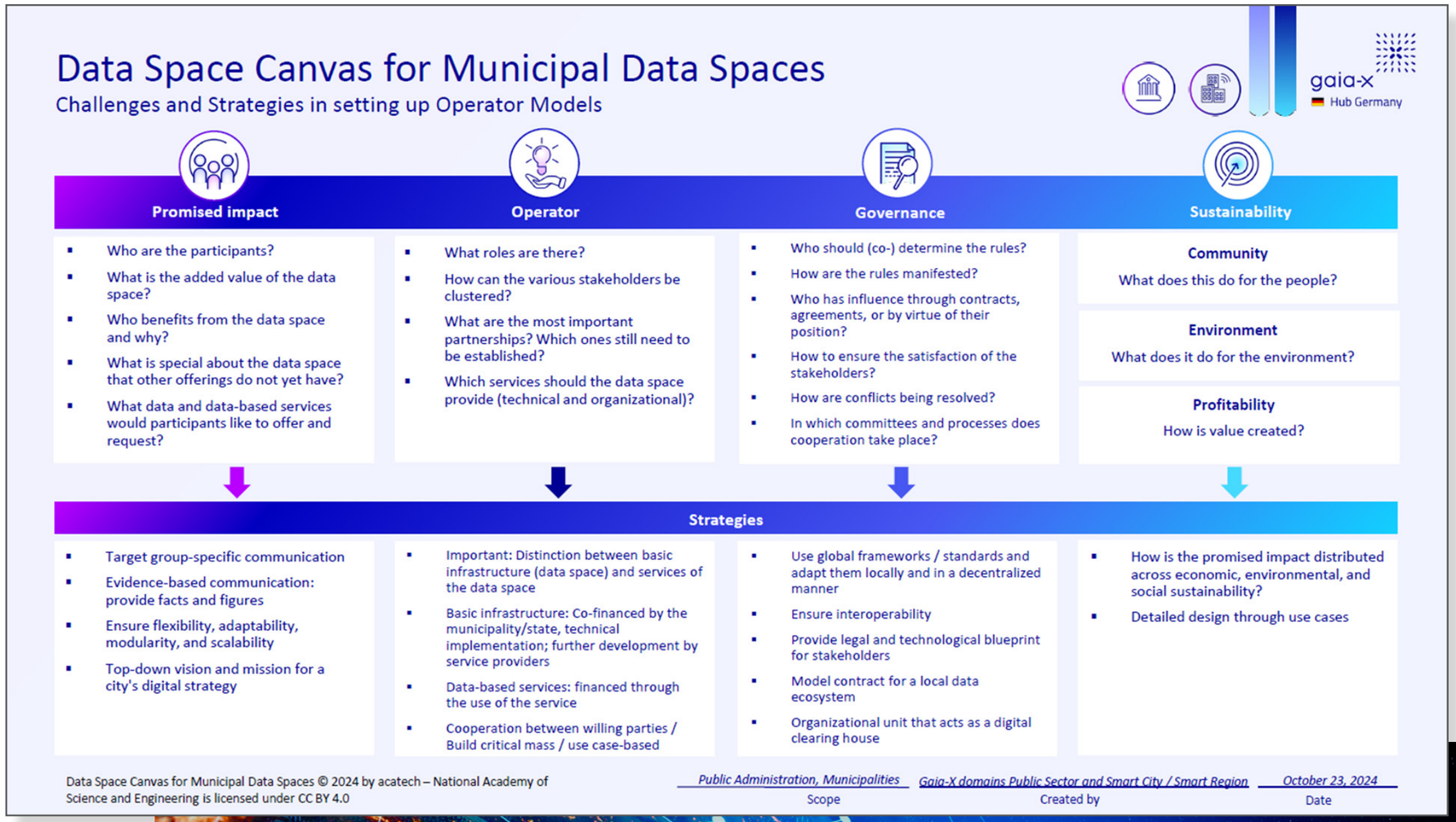


5.2.3 **Hub Austria**

Trusted Federated Data Spaces as a Key Enabler for Peace

Agnes Jodkowski, Research Engineer at AIT, Hub Austria

For more than two decades, digital transformation has driven innovation across economies and societies. Global communication platforms enable people to easily create and share content, generating vast amounts of data that have even powered the development of advanced AI tools.

With this momentum, new challenges have emerged: unequal access to data and the need for sovereign, responsible data use. In fragile and conflict-affected contexts federated data infrastructures and trustworthy data spaces are fundamental to strengthen peacebuilding by protecting sensitive information, enabling digital resilience, and supporting human-centred approaches.

The established peacebuilding principle "Do No Harm" is critical for any digital intervention. Applied to data and AI, it requires careful consideration of how information is collected, shared, and governed to avoid reinforcing tensions. Digital systems must enhance resilience while safeguarding the security, privacy, and dignity of affected communities.

Thus, safe and secure digital infrastructures and trustworthy data exchange platforms form the backbone of effective action in humanitarian aid, diplomacy, and civil society peace work. Only trustworthy, interoperable, and transparent platforms allow organisations to operate responsibly.

To support this mission, the **PeaceTech Alliance** was launched by the **Gaia-X Hub Austria** and the **AIT Austrian Institute of Technology**. The initiative aims to improve digital access for peace actors worldwide by promoting the use of modern technologies, open-source tools, and—above all—sovereign federated data spaces. As data becomes essential not only for business but for democratic societies, new approaches to sharing and managing this critical resource are needed. Data must increasingly be treated as a community asset that free societies can use and govern responsibly.

Bridging the global data gap is therefore also a peacebuilding effort. In many conflict regions, data flows one-way: collected from local communities but rarely controlled by them. This deepens inequalities and undermines trust. Ethical and federated systems can rebalance this by giving local actors ownership, consent-based sharing, and transparent governance. When data sovereignty becomes integral to peace operations, information shifts from an extractive resource to a shared good grounded in dignity and accountability.

For peacebuilders, access to trusted, context-aware data is a form of protection. It keeps sensitive information secure, protects at-risk communities, and allows cooperation without compromising local agencies. Gaia-X is already offering frameworks and open source tools to address this new field in our global digital transformation. Applied in peacebuilding, they can transform fragmented data landscapes into collaborative, secure ecosystems aligned with the Do No Harm principle that underpins all responsible peace practice.

FLTR: Helmut Leopold (Initiator IDSF, Head of Center for Digital Safety & Security am AIT Austrian Institute of Technology), Markus Kornprobst (Professor of International Relations, Vienna School of International Studies, Diplomatische Akademie Wien), Renata Ávila Pinto (CEO of Open Knowledge Foundation), Farhat Asif (Founder & President, Institute of Peace & Diplomatic Studies), Nathan Coyle (Senior PeaceTech Advisor am AIT Austrian Institute of Technology), Tobias Lang (Director, Austrian Centre for Peace) und Philipp Agathonos (Österreichischer Botschafter in Vietnam)

Fotographer: Katharina Schiffl, Fotocredit: AIT

5.3.1 Community-X

Community-X Project

Przemek Halub, Program Manager at Gaia-X & **Vera Boehner**, Ecosystem & Opportunities Manager at FIWARE

In August this year, Community-X was nominated as a Gaia-X Lighthouse project. This is a significant achievement as the project does not focus on just one profile or industrial domain; rather it brings together and combines many areas and fields that must work together and support each other.

Community-X aims to establish a truly regional data space – build with data from the region, for the region. This means that the data space will intentionally include a broad thematic spectrum: not only classical smart city data but also energy, health, mobility, security, environmental, and agricultural data – exactly the data that naturally exists within a municipality and can be meaningfully reused, shared, and monetized across the region and beyond.

Such an innovative and deliberately wide-ranging approach breaks with conventional silo thinking and ensures real value creation directly for local communities.

In order to generate value for citizens and residents, they cannot function as silos, but each of them should be part of a larger whole, so that together they can develop innovative solutions, products and services that meet the needs and requirements of the community and residents of a given region.

The project's goal is to migrate the digital platform to become a DSBA/DSSC Blueprint 2.0, and with this, a Gaia-X compatible Data Space. This should serve as a blueprint for other communities in Europe and worldwide. At an operational level, it is also a great example of the synergy and cooperation between FIWARE and Gaia-X because, as part of this initiative, the existing FIWARE-based digitalization platform is being migrated to a Gaia-X-based data space.

The emerging data space is therefore not a greenfield construct, but an evolution of this platform towards a sovereign, interoperable regional data infrastructure. Participants will be connected to the data space via the FIWARE Data Space Connector, enabling secure and trusted data exchange across municipal and regional domains. At the same time the Eclipse Data Space Connector will be used demonstrating the technical interoperability of different connectors within one data space.

This will pave the way for the development of Europe's first municipal data space.

It is worth mentioning that these activities were inspired by the small village of Etteln, which provided the seed for developing solutions for local communities in the field of data spaces.

Etteln is one of more than 500 FIWARE-based implementations of a digital platform in Smart & Sustainable Cities & Communities. Etteln is not

Photo credit: © BMDS / bundesfoto / Christina Czybik

only the most digital village in Germany but has also won the global IEEE Smart City Award at the end of 2024 - ranking even ahead of Hong-Kong. This international recognition is directly linked to the fact that Etteln succeeded where many metropolitan regions have failed: silos were dismantled, data became meaningfully usable, and interoperable services were enabled through open standards.

Based on experience gained, work is underway to define and select specific use cases that will form the basis for establishing the business models and identifying business needs. The aim is to bring the parties involved together within a coherent digital ecosystem in a form of a data space concept.

Community-X expects to demonstrate, that a regional, open-standards-based data space can be established quickly, reliably, and with proven interoperability from day one.

The project will facilitate the transfer of technological solutions from the conceptual phase to real-world applications that meet the needs of people and end users.

It should also serve as an example of how local communities can benefit from innovation through an open, sovereign and interoperable digital infrastructure.

At this early stage, it is particularly important to establish a replicable model for future trusted data spaces. This is one of the challenges and requirements for Community-X.

This project's potential has also been recognized in Europe. Community-X is proud to be one of the six projects selected for showcase at the first European Summit on Digital Sovereignty. This event was hosted by the German Federal Ministry for Digital and State Modernization at the EUREF Campus Berlin in November with representatives from 23 different countries and President Macron and Chancellor Merz as keynote speakers.

The Community-X project is an excellent opportunity for cooperation between representatives of many industries, which is why it is so important to fully exploit the potential offered by Gaia-X for the interoperability of data exchanged in a secure and trusted manner.

Community-X demonstrates how a regional, open, interoperable data space can transform scattered municipal datasets into shared digital assets available to the entire ecosystem – public authorities, citizens, SMEs, utilities, health providers, mobility operators, and environmental services alike. Which is why it is so important to fully exploit the potential offered by Gaia-X for the interoperability of data exchanged in a secure and trusted manner.

The project therefore stands as a proof point that regional data, when shared responsibly, transparently, and under sovereign control, unlocks societal, economic, and environmental value at scale.

Photo credit: © BMDS / bundesfoto / Christina Czybik

COMMUNITY-X


Photo credit: © BMDS / bundesfoto / Christina Czybik

RegenAg-X: Harvest the hidden value in farm data

Paco Conde, Co-Founder & **Gio Dal Mas**, Project Manager at Zertifier, Catalonia

Why regenerative farmers need a trusted data space

Regenerative farmers generate some of the most valuable information in the food system—soil nutrients, biodiversity indicators, microbiomes and animal welfare. Yet much of it remains locked in silos across sensors, lab dashboards and proprietary tools. This limits insight, slows decision-making and prevents farmers from accessing the value their data could create.

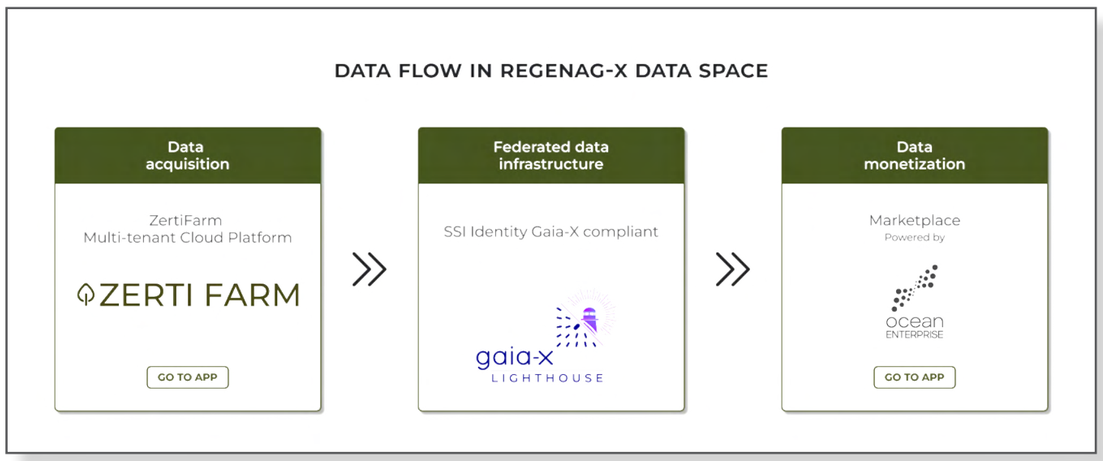
RegenAg-X addresses this challenge with a sovereign, interoperable data space where farmers keep control, innovators build services and markets access verifiable evidence of regenerative performance.

The three foundations: Powered by Gaia-X and Ocean Enterprise, backed by ZertiFarm

RegenAg-X stands on three pillars. **ZertiFarm**, the multitenant cloud platform, harmonises IoT measurements, lab analysis and soil observations into clean data assets while adapting to farmers' existing tools.

Gaia-X provides the federated trust layer through decentralised identity, verifiable credentials and shared governance, ensuring authentication, traceability and data sovereignty.

Ocean Enterprise (OEv1) adds the Web3 execution and monetisation layer. Compute-to-data workflows, a data marketplace and smart-contract-based revenue models enable secure analytics and fair economic flows, while raw data stays fully under farmer control.

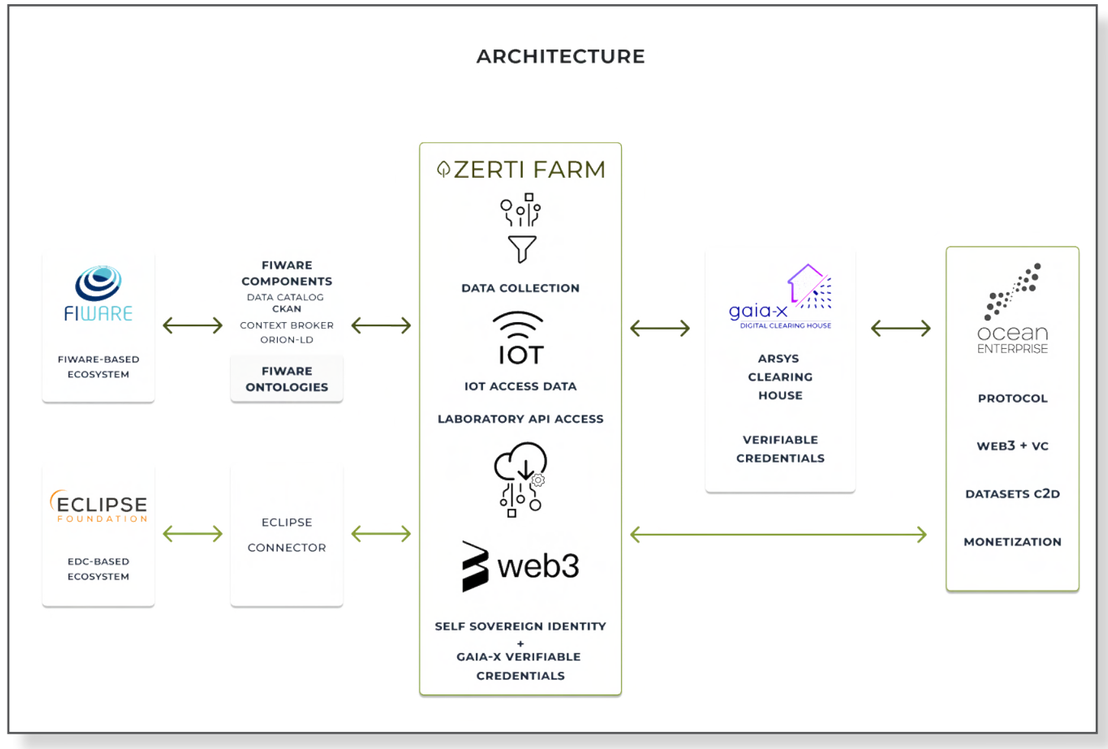


The architecture and the data flow

ZertiFarm transforms regenerative indicators into verifiable assets that enter a Gaia-X-aligned environment. These assets can then be shared or monetised through the Ocean Enterprise marketplace, forming a seamless path from data generation to insight and economic reward.

The data room: where farmers hold the keys

At the centre is the **data room**, a secure compute environment where farmers decide who may enter, what they may see and what leaves the environment. Instead of exporting raw data, RegenAg-X uses **compute-to-data**: algorithms travel into the data room, run on the farmer's datasets, and only the results—never the raw data—are released. Buyers, cooperatives or researchers obtain trusted insights while farmers keep sovereignty. When a transaction occurs, **smart contracts distribute fees** to data execution and programmable monetisation. This makes RegenAg-X compatible with diverse agricultural systems and with other Gaia-X-aligned data spaces.



The architecture is **technology-agnostic**, supporting FIWARE-, Eclipse EDC- or other connectors. A Gaia-X Digital Clearing House validates identities and policies, while Ocean Enterprise ensures secure access, compute-to-

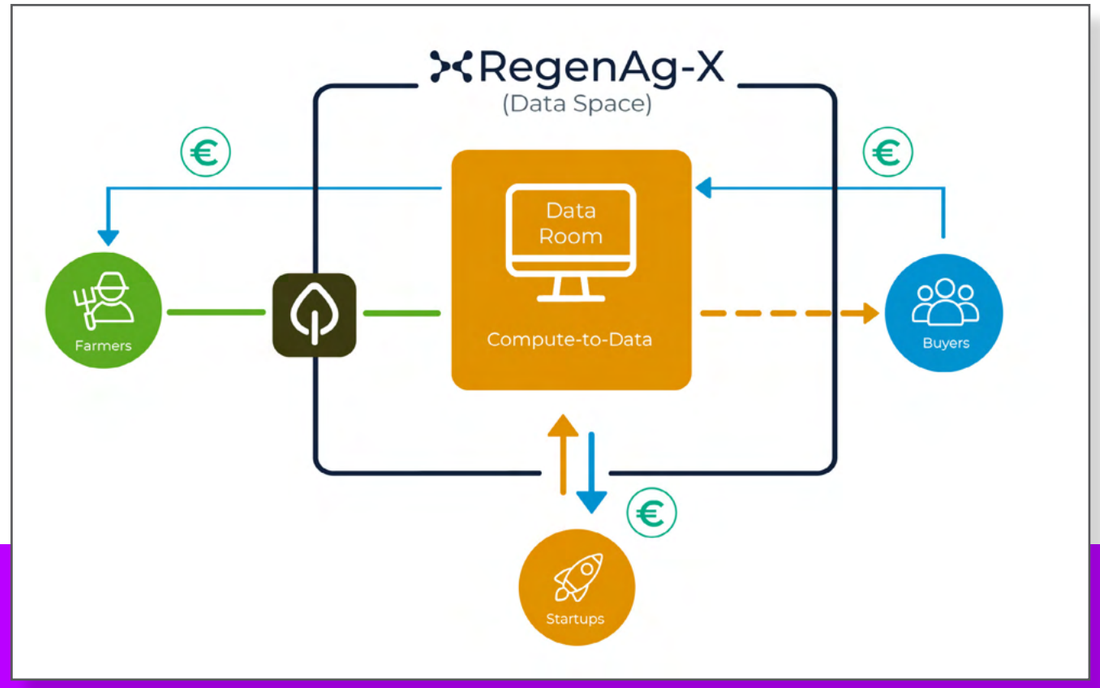
data contributors, model providers and the infrastructure, ensuring transparent and fair economic flows.

Recognition & momentum across Europe

RegenAg-X is part of the EIT Food–funded **Tech4RegenAg** initiative, with pilots in regenerative farms in the Azores. In October 2025, ZertiFarm—built on RegenAg-X—earned **2nd place at the FAO "Data for Farm Value" Global Challenge**, standing out among 200+ startups. This led to an invitation to pitch at **Y-Science during Slush in Helsinki**, one of Europe's leading innovation arenas, boosting visibility for RegenAg-X and the Gaia-X ecosystem.

By blending Gaia-X trust, Ocean Enterprise decentralisation and ZertiFarm's data-collection strength, **RegenAg-X is building a sovereign, fair and scalable data ecosystem for Europe's regenerative future.**

If this vision resonates with you, let's connect and build a more fair and sustainable food system together.



Paco Conde

Co-Founder of Zertifier

Gio Dal Mas

Project Manager at Zertifier

Digital TER-X — A European Framework for the Construction and Real Estate Data Spaces

Christophe Castaing, Expert at buildingSMART France, & **Frank Hovorka**, Technical and Innovation Director at FPI - the French federation of real estate developers.

The **global valuation of real estate and property assets** stands at **$393 trillion**, — three to four times the value of all listed stocks worldwide, while in France for example the value reaches $10 trillion. Yet this colossal wealth is managed with a fundamental knowledge gap. Both public and private stakeholders operate with **limited knowledge** regarding the intrinsic quality, resilience, and remaining lifespan of these assets. With structures designed to last for decades, this data property is unsustainable, especially when database lifespans are often drastically shorter.

This systemic deficit is the core reason why building a dedicated **Construction and Real Estate Data Space** is essential for the future of the sector and the economy at large. The **Digital TER-X** initiative is not merely a project, it's designed to bridge this gap, ensuring the long-term **sustainability**, **efficiency**, and **competitiveness** of the **construction, building, and real estate sectors**.

The Essential Catalyst: Unlocking Built Asset Data

Experience has proven that centralized, static, and non-dynamic databases inevitably fail to keep pace with the life cycle of a building.

Historically, the data market has been structured by main **contracting authorities**—public and private project owners—who coordinate orders. However, the state's control has diminished because of **data dispersion** across numerous non-interoperable agency databases and **decentralization**, which shifted decision-making to local authorities. Coupled with the **predominance of private sector demand**, this necessitates a market-driven solution rather than one controlled by the state.

The Business Model Shift: From Data to Transaction

In most current business cases in the construction & real estate sectors, the monetisation of data is already stipulated in contracts. However, to achieve the necessary scale and efficiency, the focus must shift. Extrapolating from the **€110 billion** renovation market in France, suggests approximately **187 billion data transactions**. These figures confirm that a successful model relies on **digital continuity** and the **digital information exchange** mandated by committed project owners.

The strategic shift focuses on **data transaction costs**, aligning perfectly with European regulations (**Data Act, DGA**) to promote transparency regarding cost and actors involved in each transaction. Focusing on transaction costs enables a micro-fees economy, fostering competition and innovation without hyperscaler dominance. This ensures the **market operates efficiently and transparently**, adhering to ISO standards that differentiate between the **business case** and the **system case**.

A Two-Tiered Governance Framework

A federated, secure, and transparent governance model is required for trust and efficiency, operating on two levels.

Firstly, to **manage the business organisation** via a data marketplace to address the business cases. The function is to promote the **standardisation of contracts** (data products and usage) and ensure **trust** in data integrity, neutrality, longevity, and reversibility.

Secondly, to **operate federated services**, this technical layer ensures **transaction interoperability**. It provides "machine-readable" solutions for contracts and transactions relying on standards, such as **Gaia-X** for data exchange, the future harmonised European CEN standard for **Trusted Data Transactions**, and **ISO** for construction.

It also includes **transaction monitoring services** and manages technical relationships with hyperscalers and software vendors for seamless integration.

Establishing A Data Framework For Construction And Territories

Digital TER-X is a **technology solution** serving the **Construction and Real Estate use cases**, specifically designed to address the sector's challenges. Implementing Gaia-X de facto standards for the data transaction management, and ISO standards for construction, Digital TER-X aims to create a **European framework for the Construction and Real Estate data spaces**. It delivers a ready-to-use suite of services, managed by an orchestrator, establishing a data framework for Construction and Territories, which is particularly beneficial and essential to SMEs. Digital TER-X fulfills a crucial dual strategic and technical role within each country, enabling the development of use cases by leveraging its catalogued services. At the European level, it coordinates these services across national catalogues while maintaining regulatory compliance to the Data Act, DGA, and AI Act.

Learn more https://digitalter-x.eu/

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EVENTS

In this era of rapid digital transformation, Gaia-X has emerged as a driving force, aiming to shape the future of data infrastructure and cloud services in Europe and beyond. With our focus on data sovereignty, interoperability, and trustworthiness, Gaia-X has garnered attention from industry leaders, policymakers, and technology enthusiasts alike. Through this dedicated section, we aim to provide you with comprehensive insights into Gaia-X events, keeping you informed about the latest developments, key announcements, and upcoming events.

PAST EVENTS

Gaia-X Summit 2025: Entering Season 2.0 of Data Spaces & Digital Ecosystems

The Gaia-X Summit 2025 brought more than 400 participants to Porto, representing 330 organisations from 36 countries across Europe, Asia, North America, South America, Oceania, and Africa. The event marked one of the most active editions to date, reflecting the growing momentum behind trusted and interoperable data ecosystems.

The highlight of the Summit was the release of the **Gaia-X Trust Framework 3.0 "Danube"**, a major step forward in building scalable and interoperable data ecosystems. The updated **Architecture Document** and new Danube components define and implement a unified extensibility mechanism that allows arbitrary ecosystem rulebooks to be automated in a technically compatible way. This enables, for the first time, cross-ecosystem trust rather than separate, isolated compliance regimes.

The updated **Compliance Document** delivers new functionality designed to reduce complexity and support scalable descriptions of digital services. The Gaia-X Trust Framework powers this vision by providing verifiable identities, compliance mechanisms, and digital clearing houses that ensure sovereignty, transparency, and cross-border recognition.

These advances reflect a broader transition: Gaia-X is now entering Season Two, a phase focused on consolidation, scale, and real operational impact. With more than 15+ European data spaces underway, the focus is shifting from pilots to sustainable, interoperable ecosystems that can support Europe's industrial competitiveness and future AI capabilities.

This progress was visible in Porto. Data4NuclearX and Decade-X demonstrated how the nuclear and aeronautics sectors are already applying the Gaia-X Trust Framework to secure data sharing and accelerate innovation. Meanwhile, the Catalogue of Gaia-X Compliant Services on the Market illustrates how companies can increasingly choose solutions aligned with European values of sovereignty, openness, and verifiable trust, such as Cloud Temple, Thésée DataCenter, OPIQUAD, OVHcloud, and Seeweb, which are the first 5 providers with Gaia-X Label level 3 services.

The Summit also announced the creation of the Gaia-X Hub Digital Trust Canada, further strengthening global collaboration around trusted digital infrastructures.

As the Porto Summit concluded, the message was clear: Gaia-X has reached a new stage of maturity. With the Danube Release and strengthened governance and technical tools, Europe is now equipped to build data ecosystems where trust becomes automated, sovereignty is actionable, and Europe's digital future can be built on solid, shared foundations.

Acknowledgments

Special thanks to the authors, Gaia-X editorial, web and communications teams for their efforts and support to finalise this issue.

TOGETHER TOWARDS A

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Gaia-X MAGAZINE

December 2025 | Edition 7

gaia-x