



In-depth look at data management

Architecture, actors, and economics of data spaces

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About the series

This paper contains the content of the free online course "In-depth look at the data economy: Architecture, actors, and economic efficiency of data spaces" offered by Gaia-X Hub Germany. It provides interested parties with a basic understanding of the data economy and promotes discourse and the exchange of ideas.

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Table of contents

About the series	2
Authors	2
Editor	2
Recommended citation	2
4. Your path to the data space industry.....	4
4.1 Why a data space at all? – A differentiated approach.....	4
4.2 The core reasons for data spaces: sovereignty, compliance, efficiency, innovation.....	4
4.3 Utilising existing knowledge and proven approaches.....	6
4.4. Skills: What we need to know and be able to do to get started.....	6
4.5 Orientation and support: The most important networks and institutions.....	9
4.6 Practice: Achieving goals quickly with Data Space as a Service and partners	9
4.7 Conclusion and next steps: Informed, connected, ready to act	10
4.8 Sources	10

4. Your path to the data space economy

4.1 Why a data space at all? – A differentiated approach

Many companies today are rightly asking themselves: Do we really need our own data space, or is the classic bilateral exchange sufficient? From discussions with executives, IT managers, and innovation managers, we know that true data economy is more than just a tool for sharing: It's about long-term competitiveness, flexibility, and the conscious use of resources and potential.

Traditionally, data exchange often takes place directly between two parties – for example, set up as an individual interface or a one-off project with a partner. But while this model has proven itself for individual use cases, it quickly reaches its limits: anyone who wants to cooperate with many partners or implement dynamic use cases – i.e., changing use cases – quickly loses track of the big picture with the bilateral approach. It is not uncommon for new isolated solutions to emerge that generate high IT costs in the long term, make data protection difficult to understand, and slow down innovation.

This is precisely where data spaces offer a decisive advantage: they structure the exchange and management of data in such a way that many parties can come together under clear, automated rules. This enables the transition from short-term individual projects to a sustainable – i.e., long-term viable and future-proof – position in the data economy. The move to the data space is usually not an end in itself, but rather a response to the actual requirements of a digitally networked market: realising new business models, securing international value creation, or scaling innovation processes.

4.2 The core reasons for data spaces: sovereignty, compliance, efficiency, innovation

Sovereignty – control and independence

Data spaces give a company the opportunity, for the first time, to handle data with real flexibility without having to relinquish control to third parties. Only then can we shape value creation ourselves and prevent it from flowing away to platform monopolies. We decide for ourselves who gets access and for what purposes the data is used – and can control the conditions both

technically and organisationally. Open, interoperable standards (such as those developed by Gaia-X and the Data Spaces Community) put a stop to vendor lock-in and dependencies – and at the same time ensure that our technical investments remain usable in the future, no matter how our business develops.

Compliance – sovereignty meets legal certainty

Compliance with legal requirements is mandatory for data-based business models. European regulations in particular, such as the GDPR, the Data Act, and the Data Governance Act, set high hurdles and complex documentation requirements. The advantage of modern data spaces: compliance is not an afterthought, but part of the technology itself. With Gaia-X, IDSA & Co., requirements and evidence (e.g., regarding data origin, use, security) are checked in a machine-readable and automated manner. Audits, documentation, and regulatory evidence can thus be mapped more efficiently and transparently than in traditional IT architectures. For us, this means less effort, greater security, and a [leap of faith](#) on the part of customers, partners, and authorities. [With the Data Act in particular, companies and data spaces benefit from](#) the fact that access logs, terms of use, and authorisation assignments are digitally recorded and verifiable.

Efficiency – scaling processes, reducing costs

With each additional partner and each new use case, increased efficiency becomes the decisive advantage of data spaces. Instead of creating separate structures for each new collaboration, we benefit from shared components: uniform interfaces, registered identities, common rules of use. Data spaces drastically simplify processes: from automated participant management to the rapid implementation of new use cases. In practice, this leads to accelerated project cycles, less redundancy, and greater flexibility in changing market conditions. [Examples from the Gaia-X funding competition](#) show how the combination of technical standards and [shared governance](#) not only accelerates and synchronises processes, but also systematically reduces sources of error. We can make better use of resources and develop and scale new solutions much quicker. The increased interoperability offered by Gaia-X enables better networking and the efficient use of existing data sets.

Innovation – Discovering and developing new business areas

[Data spaces are a catalyst for genuine innovation](#). Only by sharing data and services in data spaces, companies can develop new products, build data-based services, or access external data and use it to expand their own offerings. This enables products and services that were previously unthinkable from a technical or organisational perspective. The network effects grow with each participation, often resulting in [cross-industry ecosystems with entirely new value-added structures](#). For those responsible for innovation, this means that we do not have to invent everything ourselves, but can team up with partners, scale and test use cases, and respond flexibly to market trends.

4.3 Use existing knowledge and proven approaches

Before we start from scratch and rush into technical or operational implementation, it is worth taking a look at the network: Are there already existing data spaces or initiatives in our industry? It is often possible to dock onto existing structures, visit pilot projects, or benefit from the lessons learned by others instead of setting up our own complex structure.

Gaia-X Hub as a compass

The Gaia-X Hub Germany is a guide through the jungle of offers and should be the first port of call for anyone interested. Whether for an initial overview, guidance on suitable partners, technical questions, or funding programs, the hub offers regularly updated overviews of ongoing projects, exchange formats, and [information materials](#). It is particularly worthwhile for [small and medium-sized enterprises](#) to start early and develop a feel for the industry, use cases, and possible collaborations. Especially helpful: the Hub provides [practical knowledge](#) from the front line—we benefit from the experience of the Gaia-X funding competition and the constant exchange with [various data space projects](#).

4.4. Skills: What we can do and need to know to get started

The Gaia-X Hub and [Data Spaces Radar](#) show that there already is a large number of projects and data space pioneers that you can join. However, if you do not want to join an existing project, you can also implement your own idea. However, there are a few aspects and areas to consider

when implementing your own data space. Without the right know-how—not only in technology, but also in the areas of data management, governance, and communication—no data space is sustainable. It is important to understand how a data space really works and is managed. The insights from the [Gaia-X Hub's Dataspace Cheat Sheet](#) and [Gaia-X funding projects](#), as well as the DSSC's comprehensive [Knowledge Base](#) and [Co-Creation Method](#), help with this.

Industry knowledge and stakeholder analysis

This point is particularly relevant when we want to set up a completely new data space. Depending on the goal and size of your project, it may be advisable to form a "coalition of the willing" at an early stage, i.e., to identify potential data providers, users, and service partners and to bind them to the project. A consortium agreement helps to clarify motivation, objectives, and governance – turning a loose network into a resilient, long-term project. Initialising a consortium and defining use cases early on ensures focus and shared commitment. Even in the concept phase, it is advisable to develop use cases that solve real problems and create clearly measurable added value. For inspiration, the Gaia-X Hub offers [blog articles](#) and [white papers](#) that provide insight into existing projects and variations of data spaces. The [position papers of the Gaia-X Hub](#) domains are also helpful.

Carefully prepare the operating structure and governance

The choice of [organisational form](#), legal structure, governance rules, and the identification of roles (e.g., federators, trust service providers) influence the interaction of all parties involved. Clear administration, assignment of rights, and transparent processes help to make the data space project durable and resilient. The [governance building blocks](#) defined by the DSSC offer detailed guidance on dealing with the topic of governance.

Linking business model and use cases

The data space's [business model](#) must enable value creation from shared data and create incentives for all participants. Depending on the model, we can implement one or more use cases – the decisive factor is how well it fits the needs of the stakeholders and the specific industry requirements. However, this also raises questions: What does our data product look like in

concrete terms? Who has access? What intermediaries or additional services are needed? The [EUProGigant project](#) offers a case study for a business model. Analogous to the Governance Building Blocks, there are [Business Building Blocks](#), in which the DSSC provides support for business model and use case development.

Interoperability and technical standards

Uniform data models and open formats ensure cross-system exchange. Coordination via glossaries and metadata reduces misunderstandings and opens up many automation options. The [DSSC Technical Building Blocks](#) provide important theoretical guidance – especially for Dataspace Architecture Version 1.0 and the first working prototypes. For more practical relevance, we can look at the IDSA's [Reference Architecture Model](#) and [Connector Report](#), as well as the [DSSC Toolbox](#). The Toolbox combines the Co-Creation Method with the Data Space Building Blocks and shows suitable building blocks for setting up a data space.

Anchoring legal frameworks and compliance

Since various EU regulations impose legal requirements, particularly in the data economy, it is helpful to have an overview of the specific requirements at European, national, and industry level. Which laws apply, and which requirements must be observed and documented? Proactive preparation pays off, especially with regard to the [Data Act](#) and industry-specific regulations, and facilitates the implementation of compliance conditions for entering data spaces. More information on how [laws and regulations](#) are checked [in a machine-readable format](#) in a [Gaia-X data space](#) can be found in the Gaia-X Hub's tech blog series.

Plan technical implementation with foresight

The [open source landscape](#) is a real treasure trove for technical implementation. The [DSSC Toolbox](#) and the [co-creation method](#) make it easy to get started. The end result is an architecture that combines modularity, security, and scalability. Networks and forums offer help and inspiration in case of emergency.

4.5 Orientation and support: The most important networks and institutions

In addition to the Gaia-X Hub Germany as the first point of contact for interested parties in Germany, many [other players](#) also offer helpful connections. Industry-specific platforms and professional associations are also useful places for current developments, open calls, or initial use case ideas.

Gaia-X European Association for Data and Cloud AISBL provides us with uniform specifications and EU-compliant governance rules across Europe with the Gaia-X Trust Framework. Digital clearing houses are central anchors of trust that make certificates and compliance machine-readable, so that identity and conformity are not left to chance but enable trust.

Data Spaces Support Center (DSSC) offers a methodical toolkit for setting up and operating data spaces: from blueprints and standards to best practice methods, which prove to be a real asset, especially for small and medium-sized businesses and public institutions.

The International Data Spaces Association (IDSA) provides technological foundations and standards for interoperability and secure data space architectures. Particularly helpful is the [Data Spaces Radar](#), which provides a cross-industry overview of existing data spaces, use cases, and projects.

In addition to these players, there are also industry-specific hubs and networks that can be a good companion. It is worth taking a look at regularly held community events, onboarding offers, and templates for review processes and use case definitions.

4.6 Practice: Reach your goal quickly with Data Space as a Service and partners

Entering the world of data spaces for a long time has been a technical and organisational challenge, especially for SMEs. If your company lacks the resources and expertise to set up its own data space, various providers can help. Innovative providers enable quick access via "dataspace-as-a-service" by connecting to a data space infrastructure and guiding you through the onboarding process. Onboarding often takes place step by step, accompanied by best practices and sophisticated tools. This is an ideal way to get started for companies that do not want to (immediately) invest in their own data space team or want to explore the market first,

allowing them to pilot their own use cases quickly and without risk. Nevertheless, it is important to acquire data space skills so that you can differentiate between the offerings of different service providers and take individual requirements into account.

4.7 Conclusion and next steps: Informed, connected, ready to act

We have seen how a modern data space creates concrete advantages: data sovereignty is no longer just lip service, but a reality that can be implemented. Compliance with European digital laws is not only achievable but is measurably easier thanks to technology and governance. Efficiency and innovative strength increase measurably, and thanks to guidance, networking, and service offerings, getting started is quicker than expected.

Now it's up to us: If you want to discover new value creation, operate in a legally compliant manner, and jointly shape the data economy of tomorrow, you should proceed in a structured manner and take advantage of the available opportunities. From stakeholder analysis to governance, technical standards, and compliance to concrete architecture—every building block deserves attention.

Whether as users, initiators, or cooperation partners, the next steps are clear:

- Sharpen your own goals and use cases.
- Research existing data spaces, standards, and offerings.
- Strengthen team expertise and initiate initial pilot projects.
- Make targeted use of support from the Gaia-X Hub, networks, and service providers.
- Work together to create genuine, sovereign data spaces.

In this way, we are not only participating in the transition to a digital data economy—we are taking an active, formative role from the very beginning.

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