# Service Provider
Framework

## Providing Gaia-X Compliant IT & Software Services through European Data Spaces

*A practical guide for data brokers, software vendors, IT service providers and technology organisations.*

*This guide is designed for service providers in Gaia-X data spaces, including providers of software and business application services that want to expand their market opportunities in Europe, whether they are already familiar with data spaces or just beginning to explore them.*
*It outlines what data spaces are, why they matter, the opportunities they create for service providers and a set-by-step pathway to provide services on data spaces.*

# Gaia-X Data Spaces: the sovereign enablers for European data ecosystems

## Data spaces: the future of European data exchange

The concept of a "data space[1]" is central to the European data economy strategy[2]. Rather than centralising data in a single silo, data spaces create a federated ecosystem where data remains at its source and is exchanged on the terms defined by its owner. A data space is therefore neither a cloud storage platform nor a centralised data lake. It is a governed environment combining:

**Technical components**

connectors, federated catalogues[3], id<entity & trust services, and usage-control enforcement mechanisms[4]

**Legal framework**

shared governance rules, data usage policies[5] encoded in ODRL[6] (Open Digital Rights Language), and contractual agreements between participants

**Semantic interoperability**

common vocabularies, ontologies[7], and metadata schemas that allow machines to discover and interpret data correctly

**Trust & identity**

cryptographically verified participant identities using Verifiable Credentials[8]-[9]) anchored to Decentralised Identifiers (DIDs[10]-[11]) and verified by Gaia-X Digital Clearing Houses[12] (GXDCHs)

**Governance**

Rules defined by a Data Space Governance Authority (DSGA) in a Rulebook, binding all participants

The main objective of data spaces is to enable data sovereignty for data providers, empowering them to define and enforce the conditions under which their data may be accessed and used.

### Gaia-X

Gaia-X[3] enables federated, secure, and interoperable European digital infrastructures where data and cloud services can be shared and exchanged under clear, standardised rules that guarantee transparency, data sovereignty, and trust in alignment with European values and regulations.

The Gaia-X trust framework enables informed decision-making, more efficient compliance, and improved supply chain risk analysis through greater transparency and scalability.

Gaia-X (e.g. lighthouse projects[13]) provides compliance to current EU regulation, and aims to swiftly update their policies as revisions or new regulations are enforced:

Data Act · Data Gov. Act · Cyber Res. Act · GDPR · Cybersecurity Act · eIDAS · CADA · Digital Omnibus

Beyond EU regulations, Gaia-X aims to protect organisations and citizens from extra-territorial regulation.

CLOUD Act · Executive Order 12333 · FISA Act · Data Security Law · National Intelligence Law

## Data space models: from fragmented to structured

Depending on their scope and purpose, data spaces can take different forms. Two main models emerge in practice:

**The fragmented model** brings together heterogeneous actors around a shared purpose, such as multimodal mobility and tourism (Eona-X[14]) or even with no sectorial footprint (Pontus-X[15]) at all. Since participants come from diverse backgrounds with few to no interdependencies, value sharing is a key economic incentive to drive adoption and sustain collaboration.

**The structured model** builds on an existing economic backbone, where strong value chain dependencies already bind the actors, much like networks of banking agencies or complex industries such as automotive, nuclear, or aerospace (Data4NuclearX[16], DECADE-X[17]). Here, the economic lever shifts: rather than value sharing, smaller actors are more likely to be encouraged to join through subsidies or institutional mandates.

While most data space services can be adapted to either model, the design, deployment, and billing approach may differ significantly between the two. Service providers should factor this into their business case from the outset.

## Who can participate in a data space?

Any legal or natural person involved in a data space is a "Participant[18]". In a Gaia-X data space, every participant plays a distinct but complementary role to create trust, enable secure data sharing, and deliver collective value.

**Data** and/or **Service Provider**
*Participant delivering data or digital services to participants within ecosystem.*

**Operator**
*Participant operating infrastructure, ensuring availability, performance, and data space operations.*

**User**
*End-user interacting with data or services (human or machine).*

**Identity Provider**
*Participant issuing and verifying digital identities, enabling secure authentication and trust between participants.*

**Orchestrator**
*Participant coordinating governance, interoperability, onboarding, and trust across a given data space.*

**Consumer**
*Legal entity contracting and consuming data or services.*

### Gaia-X transparency principle

A key principle of Gaia-X data spaces is end-to-end transparency over the IT supply chain: every layer is described and made verifiable, from the underlying infrastructure of the services offered by providers, all the way up to the core federation services operated by the data space operator itself. This means that trust does not stop at the service level but extends to the data space itself: a consumer can verify not only who is providing a service, but on what infrastructure it runs, under which jurisdiction, and according to which governance rules making the entire stack auditable, not just the entry point.

## Who can be a data space service provider?

Any organisation providing IT services can act as a data space service provider. Beyond enabling large-scale data sharing, data spaces offer opportunities to create value through value-added services, particularly AI. Participants can share data (e.g. clinical anonymized health data) or enhanced digital services, such as pandemic watch, or even AI-enabled analytics.

Deep tech SME
*Industry-specific AI, data enrichment, monitoring services*

Research Institute
*AI model services, semantic annotation tools, interoperability testbeds*

Independent Software Vendor (ISV)
*Connector-as-a-Service, Policy Management Platform*

Cloud Provider
*Sovereign compute, storage, managed connectors…*

IT Services Company
*Domain-specific analytics, digital twin services, compliance dashboards*

Data Broker
*Multi-source data aggregation, usage rights chain management, redistributed data products*

Many providers occupy multiple roles simultaneously: an IT services company may also operate as a cloud provider for its clients, or an ISV may embed connector-as-a-service directly into its product. Gaia-X does not restrict dual positioning; it is in fact a source of competitive differentiation.

The six profiles above represent different revenue models: subscription and usage-based for ISVs and cloud providers; project and integration fees for IT services organisations; licensing and data royalties for deep tech SMEs and research institutes. Understanding which model fits your profile is the first step toward building your business case.

# Why provide services on Gaia-X data spaces?

## Scale and reach thousands of potential clients

Gaia-X data spaces provide a new route to market[19]. Providers can offer connectors, trust services, compliance tools, analytics, and data products in a structured environment. They enable access to high-security and European sovereign use cases with ready-to-use, compliant solutions and no repeated client-specific adaptation. Indeed, the Gaia-X Compliance level labels act as a market passport: a healthcare IT services company, for instance, can offer a GDPR-compliant, EU-hosted analytics service within the European Health Data Space[20] and make it accessible to hospitals and insurers under a standard data space contract, without negotiating data processing agreements bilaterally with each institution.

Data space services also fit existing capabilities: most IT, cloud, software, analytics, and integration services can be adapted and packaged into data spaces rather than rebuilt.

### Gaia-X Compliance levels[21]


Beyond standard compliance, Gaia-X offers the possibility to brand services, helping potential customers reduce due diligence effort. Enhanced European Compliance (L1), Reinforced Cybersecurity (L2), and Sovereignty (L3) labels are key differentiators for critical customers across Europe.

A labelled service gives buyers confidence that it meets verified standards, accelerating procurement decisions and opening access to regulated or enterprise markets

## Facilitated compliance to soften the regulation burden

Over recent decades, technological capabilities, most recently illustrated by AI, have grown exponentially and now play a critical role in the economy and how we collaborate. As a result, the legal framework for digital collaboration has become increasingly complex.

Within models such as Gaia-X[22], the burden of compliance[23] shifts partly towards the operator rather than resting solely on each organisation. While participants remain responsible for their own compliance, data spaces provide mechanisms that help ease what is already, and will continue to be, a growing burden.

Note that work is actively progressing on these four dimensions, so maturity levels may vary.

An **onboarding process**[24] to guide you to join a data space as a participant and to publish your services.
*Specific to each data space but based on the same Gaia-X principles for all.*

The **extension mechanism**[25] allows for tailor made compliance based on the scope of the data space and on its participants.
*e.g. banking specific regulations, trust criteria for non-EU/EEA participants.*

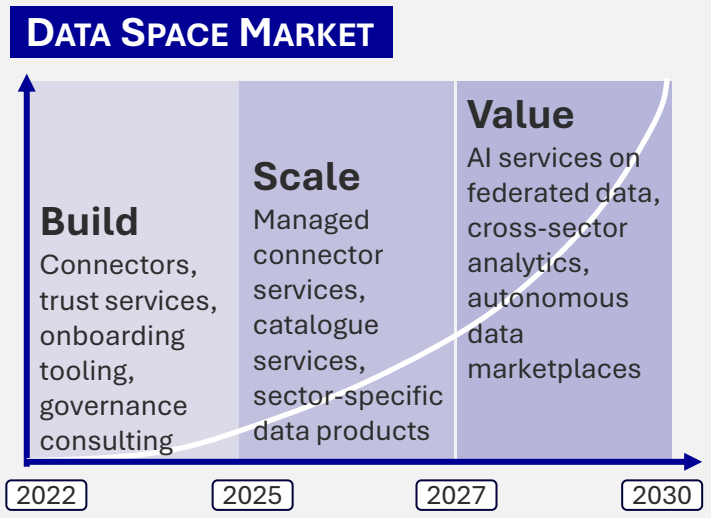
**Facilitated Compliance**

**Continuous compliance** via upgrades pushed by Gaia-X through data spaces.
*Gaia-X tracks regulatory changes and embeds them into successive versions of its framework deployable to data spaces.*

The **inheritance mechanism**[26] makes it easier to publish new labelled services by reusing existing ones, whether your own or those provided by others within a service stack *(e.g. cloud, data, application)*.

# Be an early bird in an untapped market

The European data space market has no dedicated, analyst-tracked sizing figure yet, even as the EU treats it as a strategic priority, committing €2 billion[27-28] to fund the infrastructure, governance, and lighthouse projects behind common European data spaces. In the absence of a standalone figure, the opportunity is best framed through related, already-quantified segments:




| | |
|---|---|
| European data market *EU 2024-2026* | €90B in 2024;<br>€125B by 2030 (baseline scenario, CAGR ~4.6%) |
| Data economy *EU 2024-2026* | ~€580B in 2024 (+9.2% vs 2023)<br>Already exceeded €500B in 2023 |
| European Tech spend *Forrester (2024)* | €1.4T in 2025 (+5% vs 2024)<br>Software + IT services = ~75% of tech spend |
| Cloud infras-tructure market Europe *SRC (2025)* *SRC CNBC (2026)* | €61B in 2024<br>~€75B expected in 2025 (+24%)<br>- European cloud providers' market share: ~15%<br>- Top 3 US (AWS, Microsoft, Google): ~70% |

## Advantages of entering the data space market early-on

### First movers build credi-bility early

Providers entering now can become known reference players before the market becomes crowded.

### Early onboarding creates reusable assets

Once identity, trust, and core compliance elements are in place, future participation in additional data spaces becomes much easier.

### Learning advantage compounds

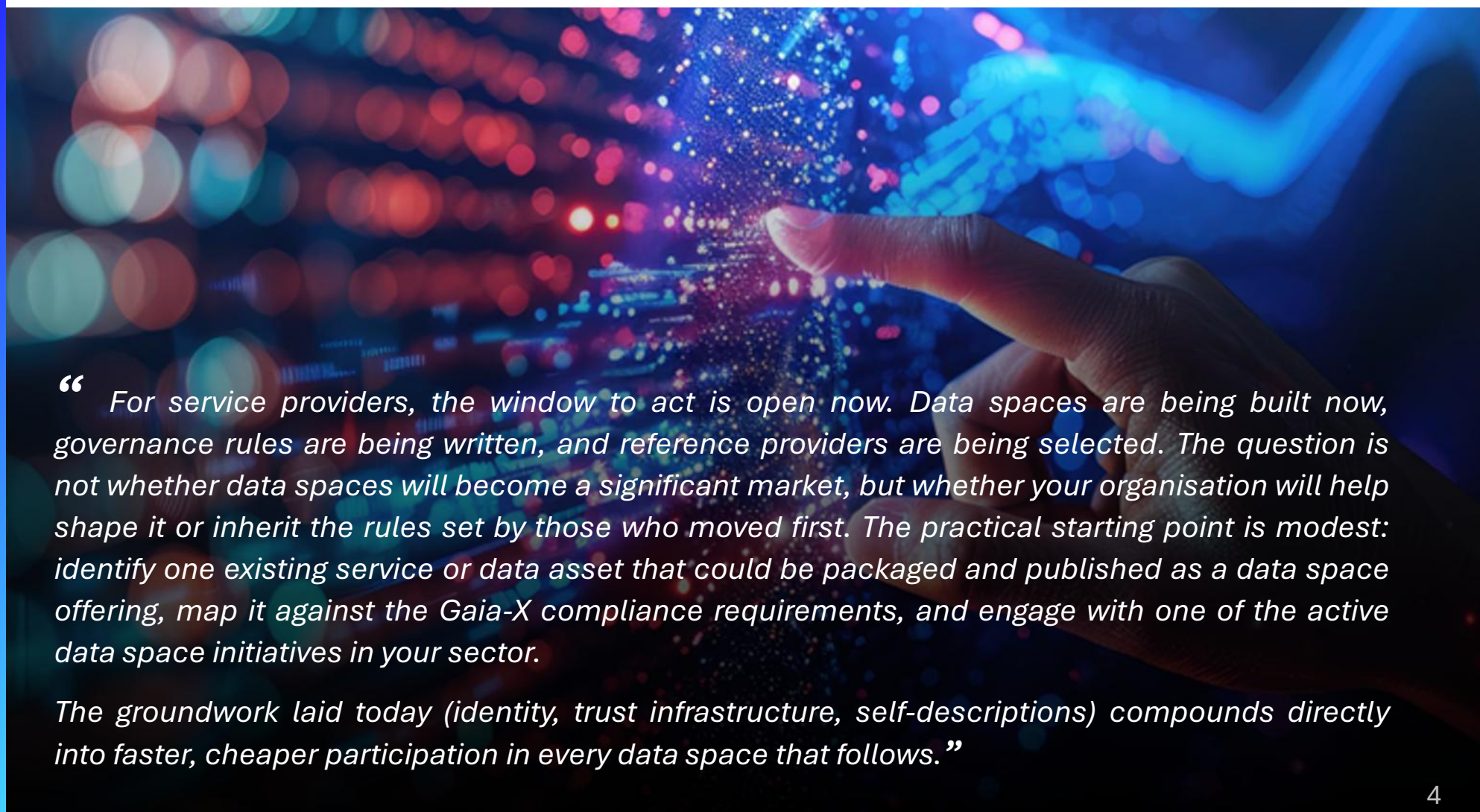
Early providers gain experience with governance, onboarding, billing, and lifecycle management ahead of slower competitors.

### Room to shape the market

Early participants can influence service expectations, partnerships, and operating models rather than adapting later to rules set by others.

### Higher cost of waiting

Delayed entry risks losing visibility, partnerships, and customer relationships in ecosystems that are now taking shape.



*"For service providers, the window to act is open now. Data spaces are being built now, governance rules are being written, and reference providers are being selected. The question is not whether data spaces will become a significant market, but whether your organisation will help shape it or inherit the rules set by those who moved first. The practical starting point is modest: identify one existing service or data asset that could be packaged and published as a data space offering, map it against the Gaia-X compliance requirements, and engage with one of the active data space initiatives in your sector.*

*The groundwork laid today (identity, trust infrastructure, self-descriptions) compounds directly into faster, cheaper participation in every data space that follows."*

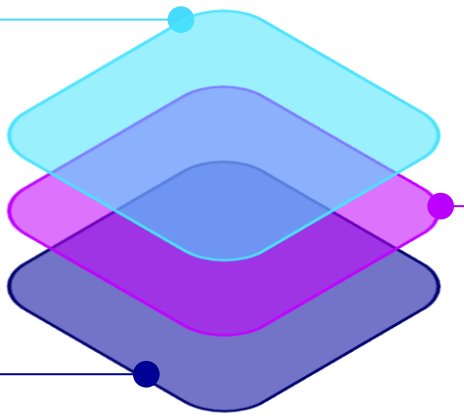
# What services can be provided through data spaces?

## Business model: the different types of Services

### Business Services

Value-added services and applications consuming data from the data space

*Industry analytics, AI/ML models as a service, compliance dashboards, supply chain optimisation, digital twin platforms…*



### Data Space Federation Services

Compute, storage, networking, compliance engine services that underpin data space operation.

**Gaia-X :** Bring your own rules with the extension mechanism.

*Sovereign cloud IaaS, edge computing, secure enclaves, data storage services compliant with Gaia-X labels…*

### Data Services

Services enabling data to be exchanged, enriched, and consumed

*Data connectors, metadata brokerage, data quality tools, anonymisation services, semantic translation, data marketplaces…*

**Business Model**

- ☐ Business | Data | Federation
- ☐ Open-source | Proprietary
- ☐ Generic | Specific
- ☐ Mainstream | Cloud Native
- ☐ Subscription | Pay per use

## Business model: the intellectual property strategy

### Gaia-X : open governance beyond open source

Among the 4 pillars of Gaia-X (legal, organisational, technical, and semantic) the last 2 serve interoperability and are open source based[28].

Gaia-X values go beyond using open-source components and promote open governance, preventing any single actor from capturing the ecosystem or dictating its evolution.

Specifications, rules, and reference code are published openly and can be inspected, reused, or built upon by anyone. This guarantees that data spaces remain trustworthy environments where stakeholders keep control over their data.

This openness primarily applies to the foundation layer (specifications, trust framework, connectors).

Above it, providers remain free to choose open source or proprietary licensing for their own product. Open source also brings two advantages:

- interoperability across data spaces: openly available components can be reused and adapted
- faster adoption through shared UI/UX, democratizing data spaces' services

## Business model: a wide range of market segments for data space services

A service provider can address different market segments: whether by issuing a generic service, widely used across one or several data space and for which multiple sourcing is prerequisite, and/or by issuing specific services, with high added value, specific to a need and or a context. The balance of a service design can be found over volume, value and lifecycle.

**Generic services**

- standardised and interoperable building blocks
- provide reliable, widely accessible capabilities
- multiple providers and easy portability

The aim: actively counter vendor lock-in and help redistribute value across the European digital economy.

*Digital wallets, catalogue and registry services, trust and onboarding components, standardised connectors…*

**Specific Services**

- tailored, value-added offerings
- beyond off-the-shelf components
- meet precise business needs

Driven by investment in expertise, data, or R&D, they convert data exchange into competitive advantage.

*Sustainability reporting and carbon footprint analytics, Synthetic data generation for sensitive domains…*

## Business model: upgrade mainstream services

Most potential data space service providers already operate mainstream services that can be upgraded to become dataspace-ready. A provider can get a head start by leveraging existing assets (whether their own existing services or data space ready enablers), but starting from scratch is equally valid for those who prefer a clean-slate approach.

| Gaia-X Data space readiness | Legacy Services | Cloud-Native Services | Cross organisations Data Mesh |
|---|---|---|---|
| Stack | Old (monolith, on-prem, proprietary APIs) | Modern (REST/GraphQL, cloud, containerized), with API layer and Network-accessible endpoint | Modern (REST/GraphQL, cloud, containerised) and like-minded architecture (data product, API, access) |
| | Low | High | Very High |
| | Required upgrade<br>• Add a Data Space Adapter in front of the system, without touching the core. | Required upgrade<br>• Implement a lightweight compliant endpoint directly in the API layer or build one | Required upgrade<br>• Standardise on open protocols across domains; trust, catalogue, and contracts become federated. |
| | *The adapter absorbs policy enforcement, contracts, and catalog publishing (DCAT /JSON-LD) so the legacy product and its certifications stay untouched.*<br>*Pick any open-source-based connector such as the DTA (Dawex) or those tested against the DSP TCK (Eclipse EDC, TNO Security Gateway, FIWARE Data Space Connector, DSP TRUE Connector, EARIS, Tekniker Connector, Amadeus EDC Connector).*<br>*Ocean Enterprise also possible, supports OpenID and Gaia-X identities with anchoring via Smart Contracts.* | *Same open-source connector list applies (lighter-weight configs).*<br>*Set-up identity federation via existing OAuth2/OIDC, Ocean Enterprise, or DCP (Decentralized Claims Protocol) for verifiable-credential interoperability.*<br>*Optional: Ocean Enterprise enables Compute-to-Data for IP- and data protection and e-money based monetization.* | *DSP path : federated catalogue via DCAT/JSON-LD, ODRL-based usage policies, DCP or Gaia-X Trust Framework credentials*<br>*DTA path : data product & DAC management, built-in policy enforcement, Gaia-X Trust Framework credentials via OIDC4VC/OIDC4VP*<br>*Pontus-X / Ocean Enterprise: Gaia-X Trust Framework-aligned identity (VC-JWT via OIDC4VP, built-in policy enforcement, Privacy- and IP-preserving Compute-to-Data.* |

Note that these solutions are illustrative, as the open-source landscape is diverse and evolving.

## Business model: define the billing strategy

Data space billing models borrow heavily from data marketplace models. The vocabulary and commercial logic are familiar however; in a data space the provider does not hold a central place.

| DATA SPACE MODEL & GOVERNANCE | |
|---|---|
| Direct billing (provider to consumer) | The provider invoices the consumer directly, using contact information exchanged during or after the connector-level contract negotiation. Suitable for established B2B relationships and high-value services. |
| Marketplace / 3rd party billing (via operator) | Some data spaces (e.g. Prometheus-X[29], Pontus-X[30]) propose a marketplace layer that handles payment processing, metering, and invoicing between providers and consumers. The provider lists on the marketplace; the operator charges a commission. Suitable for SMEs and new entrants seeking simplified commercialisation. |

| NATURE OF SERVICE | |
|---|---|
| Subscription model | Provider offers access to a service tier under a time-based subscription. Managed through standard commercial agreements, with data space policies enforcing access rights. Suitable for managed connectors, platform services. |
| Usage-based / Pay-per-query | Fine-grained billing per API call or data transaction. Requires a metering layer, either built into the connector or provided by the marketplace operator. Enables low-entry-cost consumption, suitable for AI inference or data enrichment services. |

# How to distribute services via a data space

## The pathway to providing services via a data space

### Onboard Data Space

Service providers onboard to a data space in two ways: as **participants**[31-32] and by registering their **services**. Each data space defines its own onboarding process, typically a single flow covering both aspects[33]. Providers can add services at any time after their initial onboarding.


The service provider is **responsible** for managing its services: designing it against the applicable **compliance level**, creating and publishing an accurate **self-description** in the **federated catalogue**, keeping it up to date as the service evolves.

The provider must define and maintain **usage policies** independently of any individual customer contract, manage **versioning** so existing consumers are not disrupted, and ensure **continuous compliance** with the data space's trust framework not just at onboarding but on an ongoing basis.

When a service is **discontinued**, providers must formally withdraw it from the catalogue to allow consumers time to **transition**.

Once the services are available through a **catalogue**[34], consumer may contract with the service provider. After verifying their **policy match** (terms and conditions and usage intentions), checking their **credentials** and negotiating, they may sign the contact with and **enforce** it whenever the service is requested by the consumer.

The provider ensures the **availability** of its services as agreed in the contract.

The provider **bills** its services, according the terms and conditions of the contract and to the business model of the data space and of the service.

Either party can **terminate** per the agreed contract terms; the provider terminates by revoking the consumer's usage credential or Data Usage Agreement.

Beyond the business decision of launching a service, the required skills to get operational are DevOps/cloud-native engineering, backend integration development, identity & PKI management, ODRL policy modelling, and compliance & legal expertise.

Your team may find guidance, building blocks[35] and toolkits[36] on the Gaia-X documents portal[37].

# Gaia-X Service Provider Framework: the Guidebook

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