



DISCOVER NETPIG

An operational use case within the AgrospAI data space demonstrator



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MINISTERIO
PARA LA TRANSFORMACIÓN DIGITAL
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SECRETARÍA DE ESTADO
DE DIGITALIZACIÓN
E INTELIGENCIA ARTIFICIAL

 Plan de Recuperación,
Transformación
y Resiliencia

Organizational

Key partners

Enabler: AgrospAI, Universitat de Lleida

Data providers: pig farmers, technical offices

Service providers: certification entities, public administrations

Consumers: pig farmers, technical offices, certification entities, public administrations



Resources

Promoting entity: AgrospAI (UdL)

Budget: between 50K and 60K €


Infrastructure: federated data space



Business case

Costs: related to personnel, training, equipment, computing and interoperability services.


Expected benefits: emission reduction, process optimization, access to environmental certifications and new business opportunities for all stakeholders.



Governance model

This use case follows the governance model of the enabler’s infrastructure.

First, with the enabler as governance authority establishing governance rules. Later, evolving toward shared governance with participants.



Current status

The project is currently in its operational phase, with real assets already published in the catalogue and available for user interaction. The next steps involve incorporating additional stakeholders, as well as new data and service providers from the sector.


Exploratory stage

Preparatory stage

Implementation stage

Operational stage

Scaling stage



Why?

Context

The pig farming sector is a key part of Spain’s agricultural economy but faces growing pressure to reduce emissions and comply with European sustainability goals such as the Green Deal and Farm to Fork.



Added value

For farmers and technical offices, it reduces administrative workloads, eliminates repetitive manual reporting, and facilitates faster access to both mandatory and voluntary environmental certifications.

For public administrations and certifying bodies, it delivers standardized, traceable, and interoperable data that streamline auditing processes.


Beyond operational gains, the initiative strengthens transparency and consumer trust by demonstrating verifiable commitment to sustainable farming.



Motivation & objectives

NetPig aims to create a trusted, interoperable framework for data exchange that automates certification, improves decision-making, and empowers farmers to manage their own data responsibly.


Its broader goal is to demonstrate how data spaces can advance the sector’s digital transformation through data sharing that generates valuable services without compromising data sovereignty.



Shared processes


Some steps are carried out individually by each partner. They collect and preprocess their data, then publish the results to the catalogue. Afterwards, interpretation, combination and transformation can take place within the data space. Each actor stores their data and results independently. Finally, the creation of new services or use cases can be a shared process.

	Individual	Shared
Use	<div></div>	<div></div>
↑		
Visualize	<div></div>	<div></div>
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Interpret	<div></div>	<div></div>
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Combine	<div></div>	<div></div>
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Transform	<div></div>	<div></div>
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Store	<div></div>	<div></div>
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Create	<div></div>	<div></div>



Implementation roadmap

1. Analysis of the context.
2. Use case feasibility assessment guide.
3. Use case design guide.
4. Algorithm development.
5. Deployment within the data space.



Technical

Data & data sources


Data on:

- CO₂ and NH₃ emissions

Sources include:

- Farms
- Technical offices
- Public registries

Data follows FAIR principles: Findable, Accessible, Interoperable, and Reusable.




Interoperability

Building on AgrospAI's ecosystem, interoperability is addressed on two levels.

At the federation level, it connects with other data spaces through the Pontus-X ecosystem, aligned with Gaia-X standards and using trust and clearing-house mechanisms to guarantee secure and verifiable exchanges.


At the data level, interoperability is achieved through semantic mapping based on ontologies and Semantic Web technologies.



Technical concepts/models

Federated architecture based on Compute-to-Data and Distributed Ledger Technology (DLT). Smart contracts.

Users can interact with the system through a web portal for convenience, or alternatively via API or CLI.



Infrastructure characteristics

The algorithm is a container hosted on DockerHub, while the input data is a static CSV stored in a private MinIO instance.

Processing occurs in an isolated environment within a Kubernetes cluster, deployed at the Universitat de Lleida. Results are shared in a decentralized manner via IPFS.

