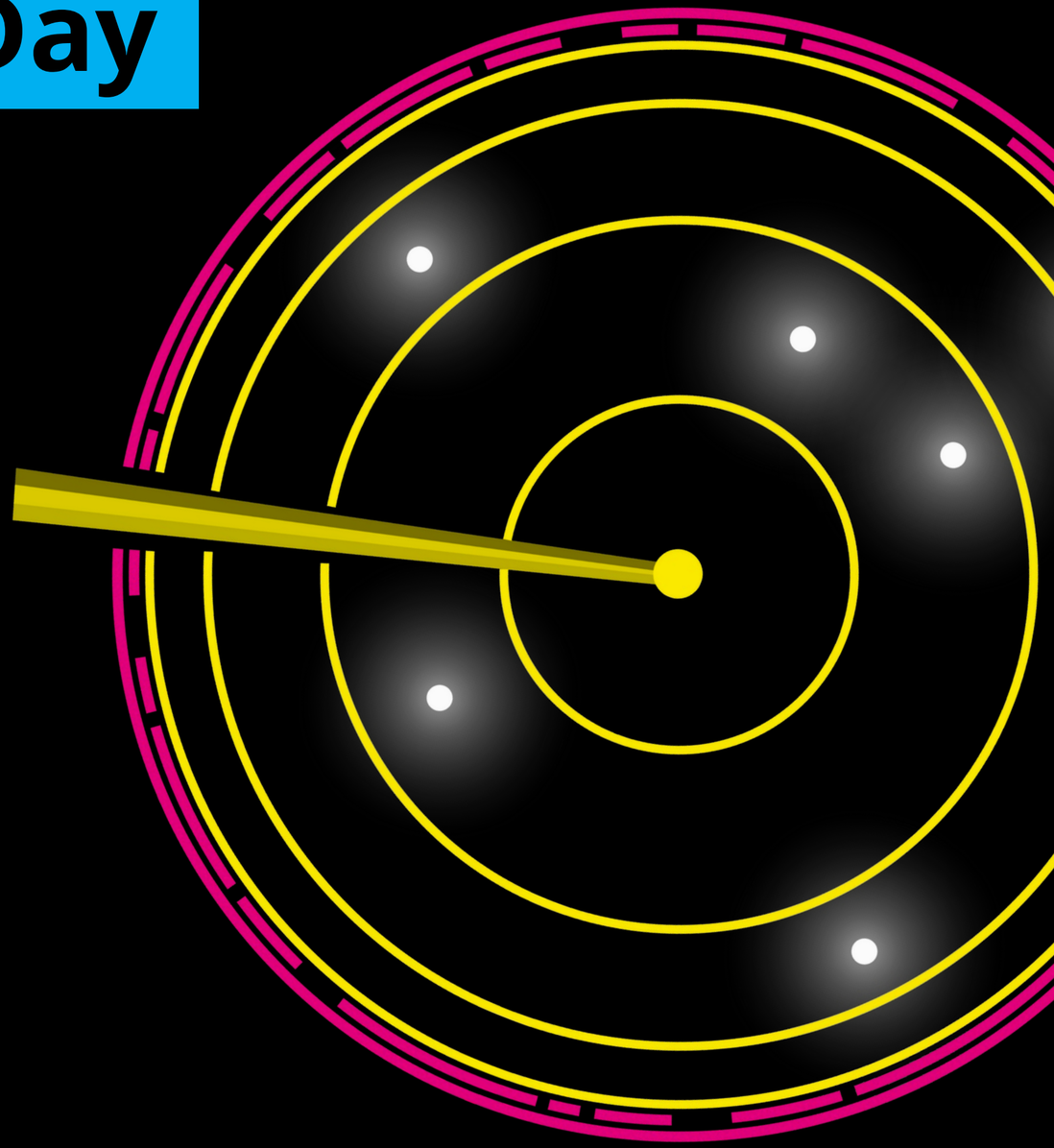
Data Spaces Discovery Day

October 19, 2023 | Vienna



Pioneering data spaces for agriculture

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Agriculture Data Space

- One of the initial common European data spaces
- Data sharing: collaborative use of data for a shared goal
- Part of a Digital ecosystem
- Comprises all components that generate, store, manage, or consume data and are interconnected.
- Digital platform(s) as a key part of the dataspace infrastructure.
- Needs to ensure data sovereignty & interoperability

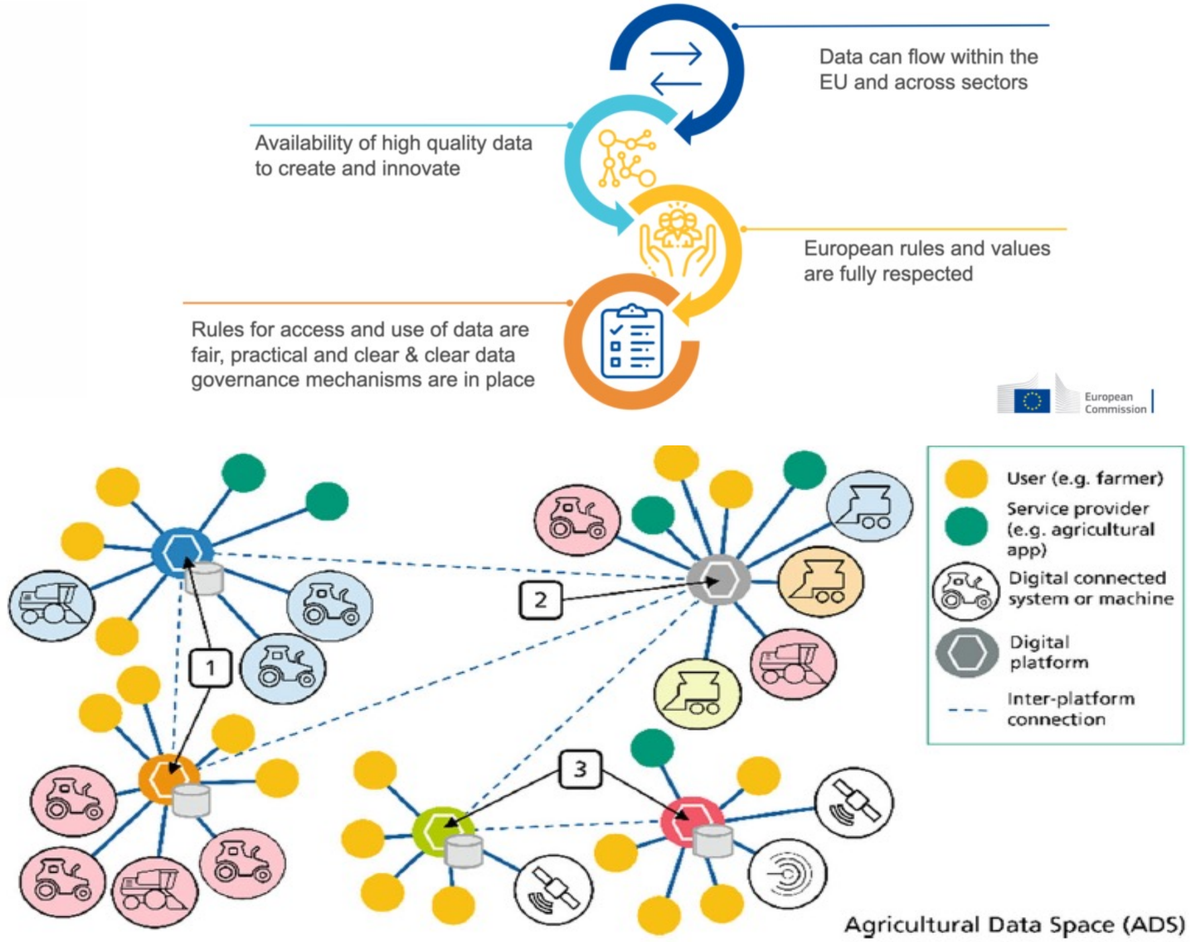


Fig. 17.1 The agricultural data space as a domain ecosystem with interconnected digital platforms and specific digital (sub-)ecosystems (machine manufacturers platforms (1), routing platform (2), and service specific platforms (3)). (illustration ©2021, Fraunhofer IESE)

Building the European data space for agriculture

Methodology: From the mapping of the data sharing initiatives to designing a roadmap

Data Sharing

understanding and mapping of the data sharing landscape

Building blocks

for a profitable and responsible EU data space in Agriculture

Data Space

a tool for change: roadmap towards the data space for agriculture

How?

AgriDataSpace integrates a **consultation process to give feedback and recommendations** on **progress and results**; it will **test, verify, and challenge the findings** based on stakeholders' experience

Find a consensus

One of the project objectives:

Engage stakeholders in various activities for evaluation and validation to reach broad consensus on the design of the data space for agriculture.

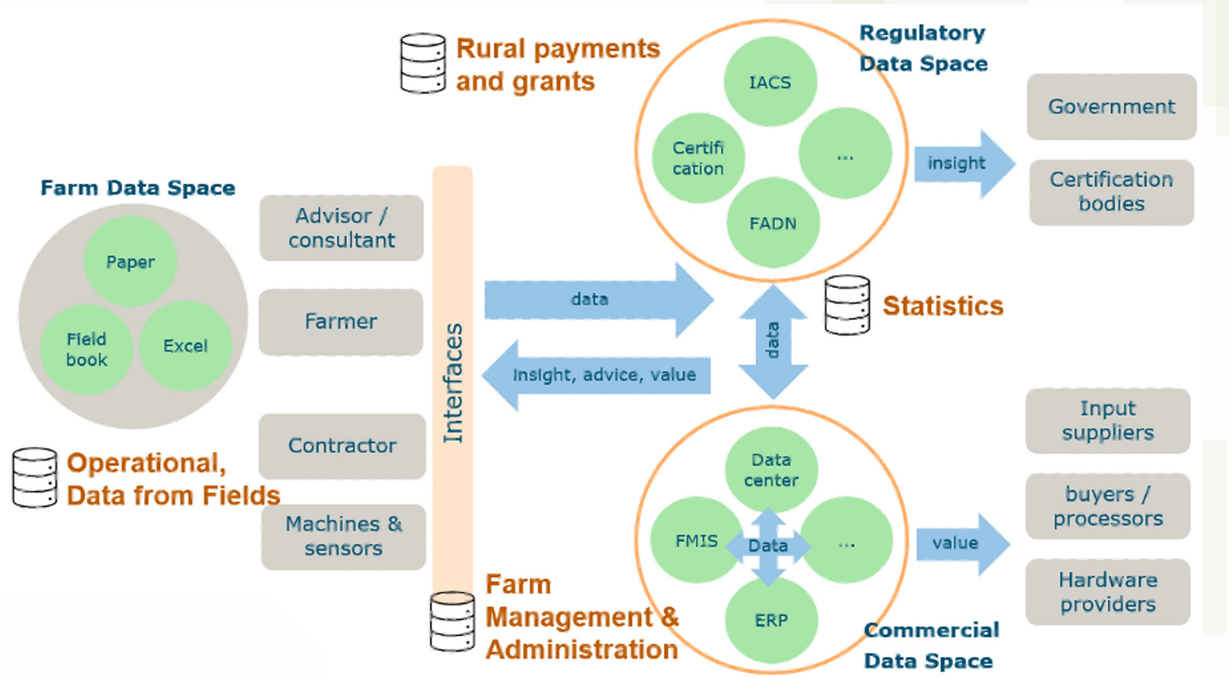
The current use of data systems in agriculture

Broad existing categories

- Operational, Data from Fields
- Farm Management and Admin
- Rural Payments and Grants

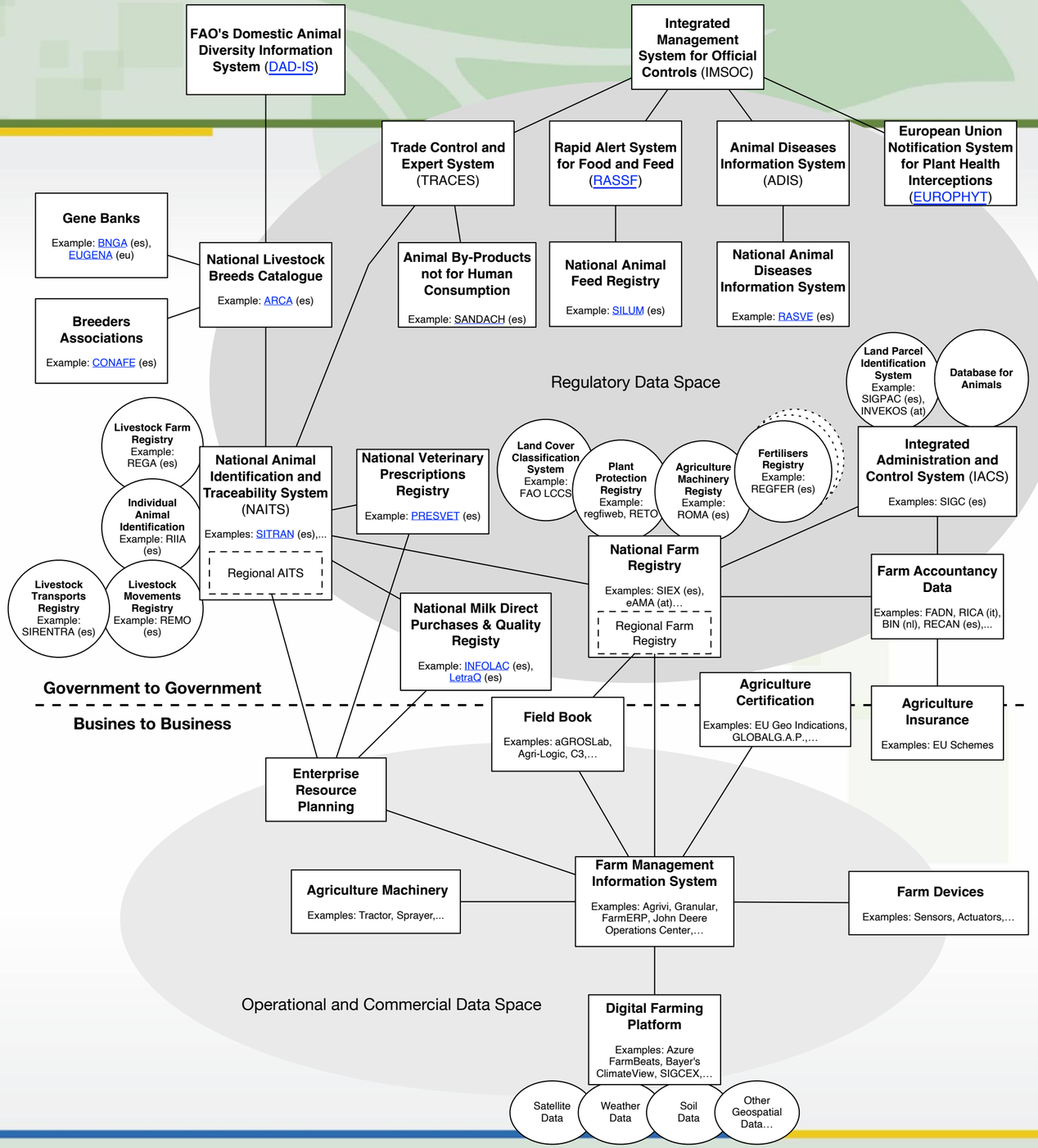
Current situation

- Highly fragmented
- Little, to no interoperability
- Short-sighted, siloed, data-ownership based business models

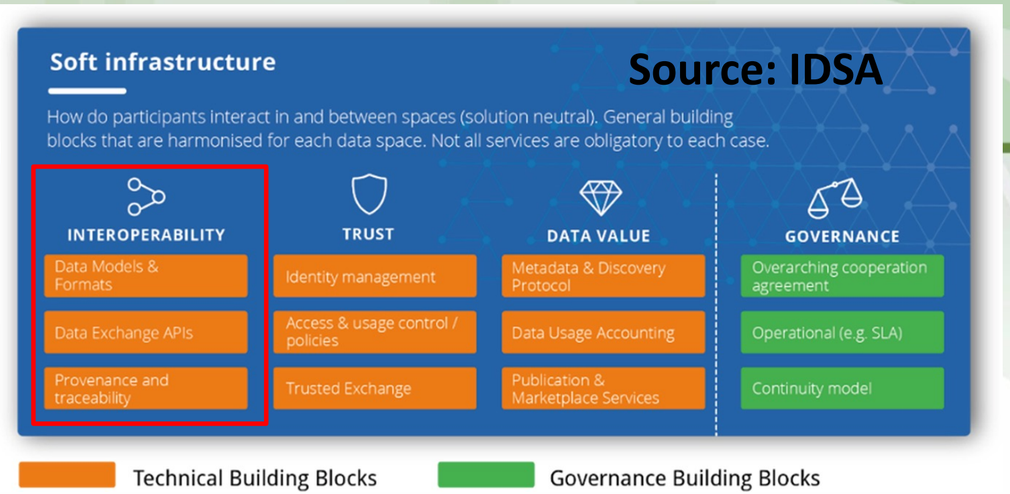


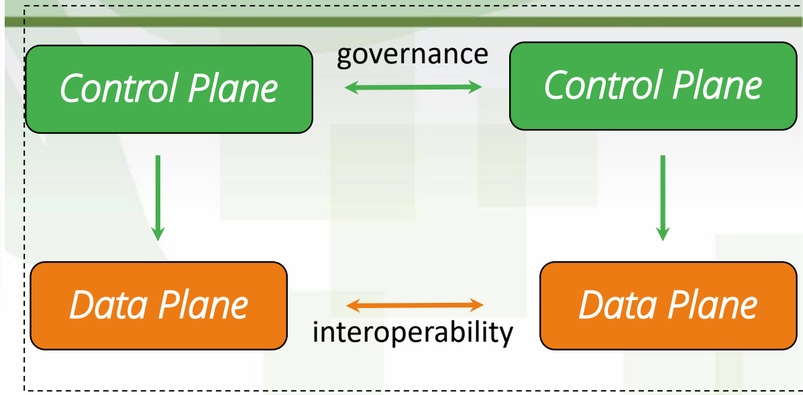
Plus: Lot of legacy to deal with...

A very complex landscape



Architectural Building Blocks



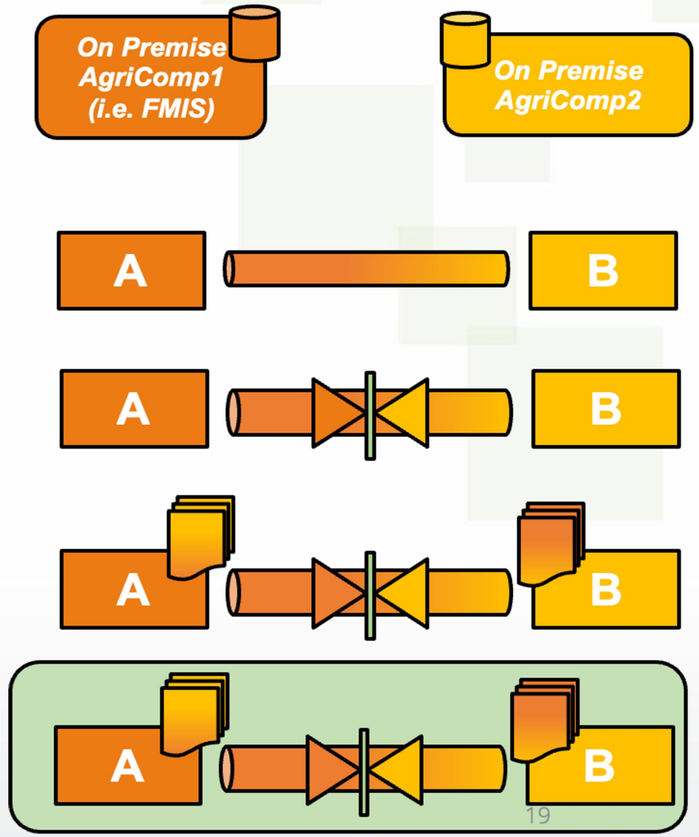


Basic integration (communication protocols)
foundational interoperability (i.e. MQTT, REST/HTTP)

Intermediate (machine-readability)
interface interoperability (i.e. JSON, metadata)

Advanced (data models)
syntactic interoperability (i.e. structured APIs)

Full (common ontologies, vocabularies)
semantic interoperability (i.e. AIM, AGROVOC)



Semantic interoperability

- Ensures common understanding of the meaning of the exchanged content.
- Involves: common data models, interoperability mechanisms
- Several standards/initiatives have proposed different models for the agriculture domain (e.g., >150 in AgroPortal), which are being used for different purposes/objectives.
- Recent approaches aim at enabling the interoperability of well-known models, leveraging and reusing as much as possible existing standards (AIM)

Data access & exchange API (e.g., OGC standard APIs – STA, Features, Records, etc.)

Data harmonization and integration (e.g., ETL, Linked Data, data transformation/lifting)

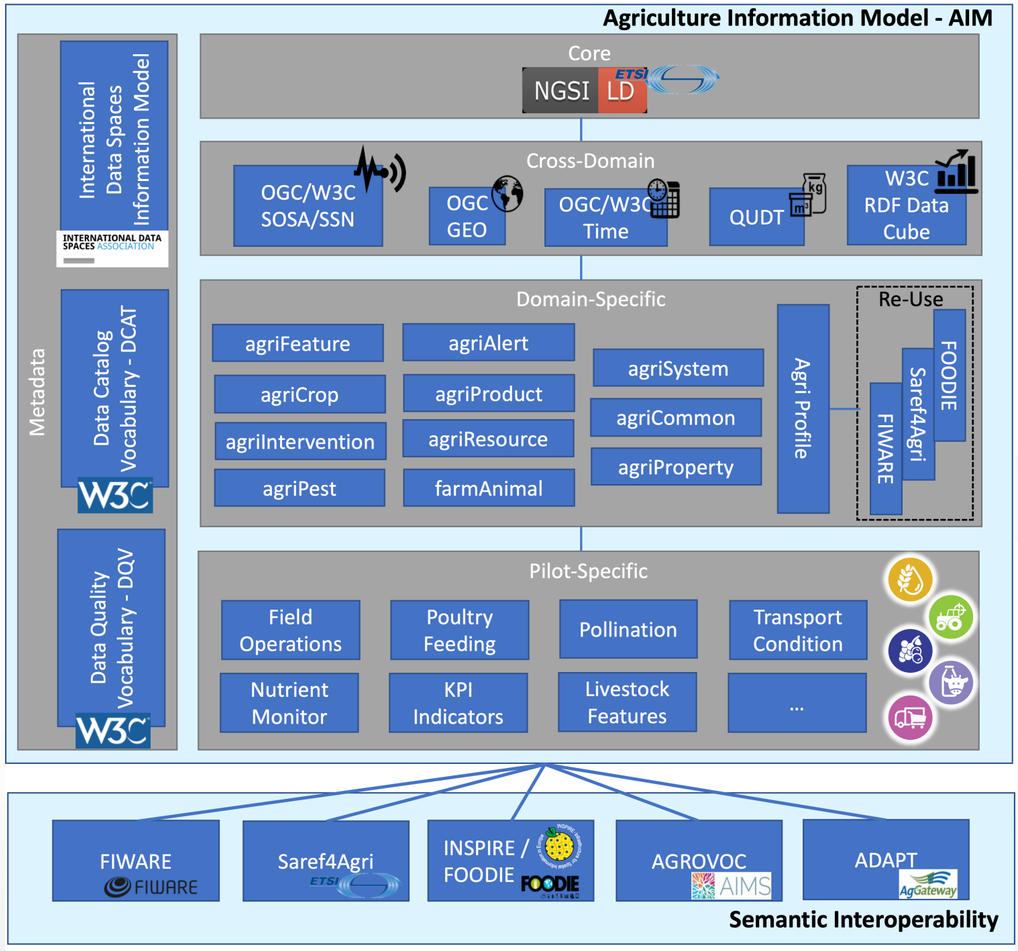
Common data models/vocabularies (e.g., ontologies, thesauri, controlled vocabularies, etc.)

Agriculture Information Model - AIM

AIM aims to establish the basis of a common agricultural data space, enable the interoperation of different systems, and the analysis of data produced by those systems in an integrated manner

AIM follows a modular approach in a layered architecture:

- realized as a suite of ontologies and associated JSON-LD contexts plus a set of SHACL shapes enabling validation of data at the semantic level.
- implemented in line with best practices, reusing existing standards and well-scoped models
- establishes alignments between base models to enable their interoperability and the integration of existing data



Open Geospatial Consortium

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why dataspaces for agriculture are a good thing? - potential use-cases

Digital Twin

Risk Management and Mitigation

Sustainability and LCA of production processes

Agri data in Poland

Data Siloes

Legal restrictions

Self-centered thinking

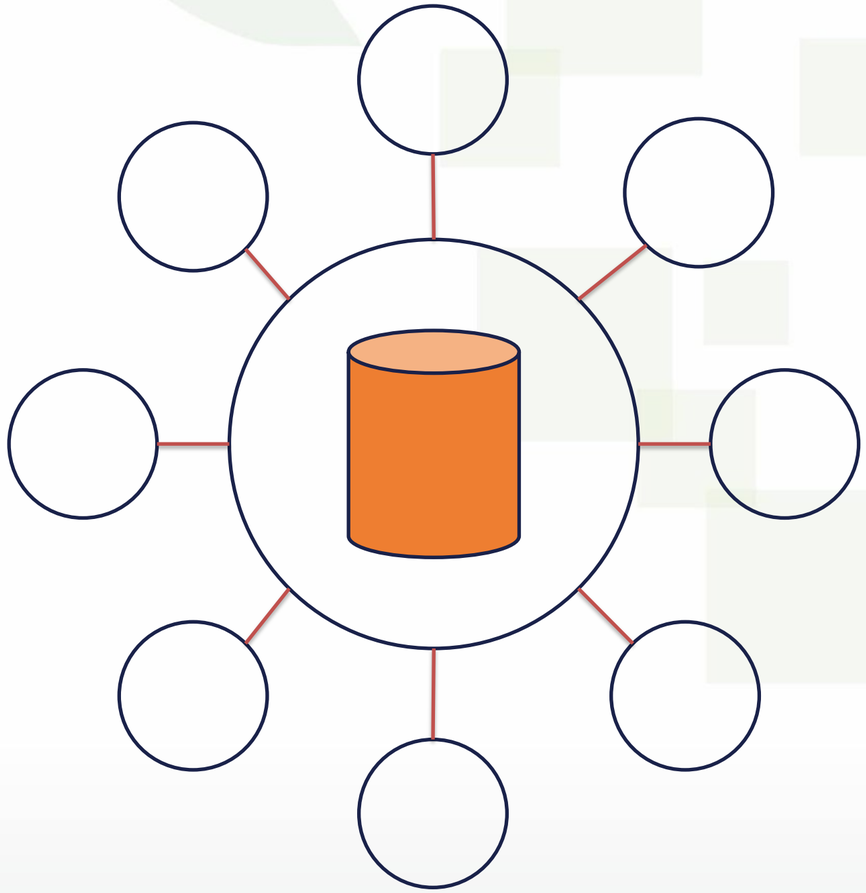
Lack of coordination of data exchange

Incompatible / old technologies

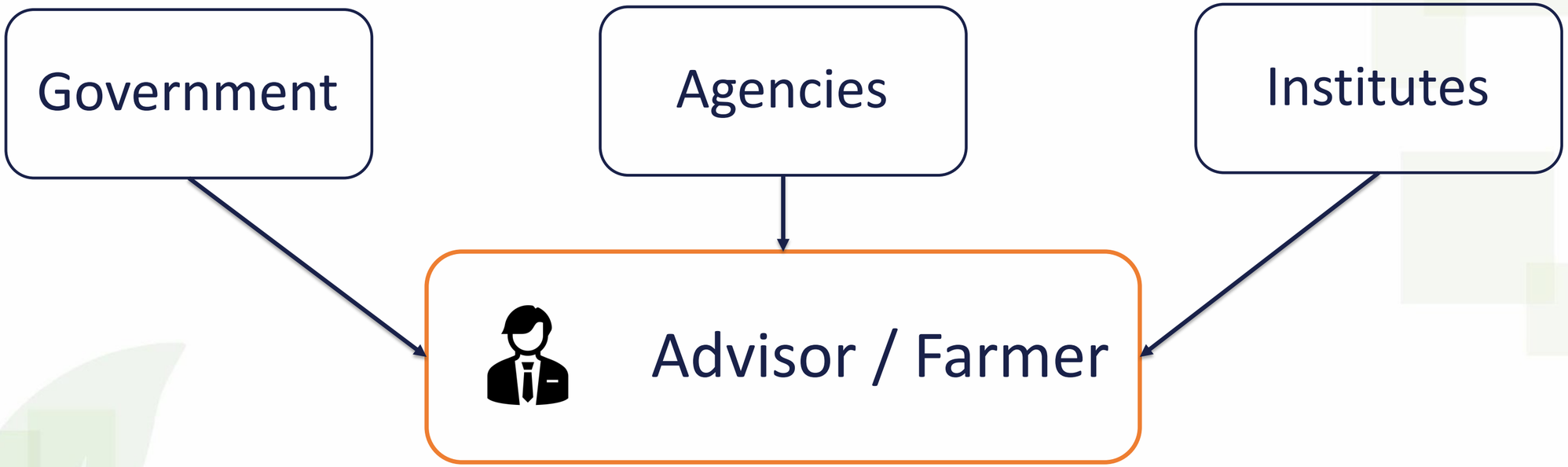
Agri data in Poland – needs and challenges

Aggregation of dictionary data. Centralized data sources

- Plants
- Crop varieties
- Pests, disesases, weeds (agrophages)
- Plant protection products (trade names of authorized products, active substances)
- Fertilisers
- Meteorological data
- Drought data
- Sowing data
- Agricurtural parcels (spatial data)



Previous state



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Access to data through sources available e.g. on the websites of institutions holding the data

Ongoing - eDWIN Platform

Government

Agencies

Institutes

Central access point

eDWIN

Common data bus

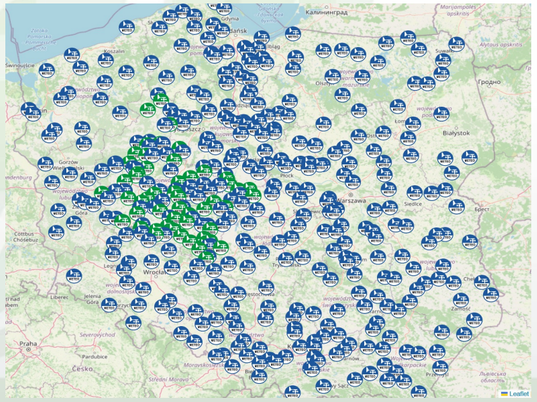
Advisor / Farmer

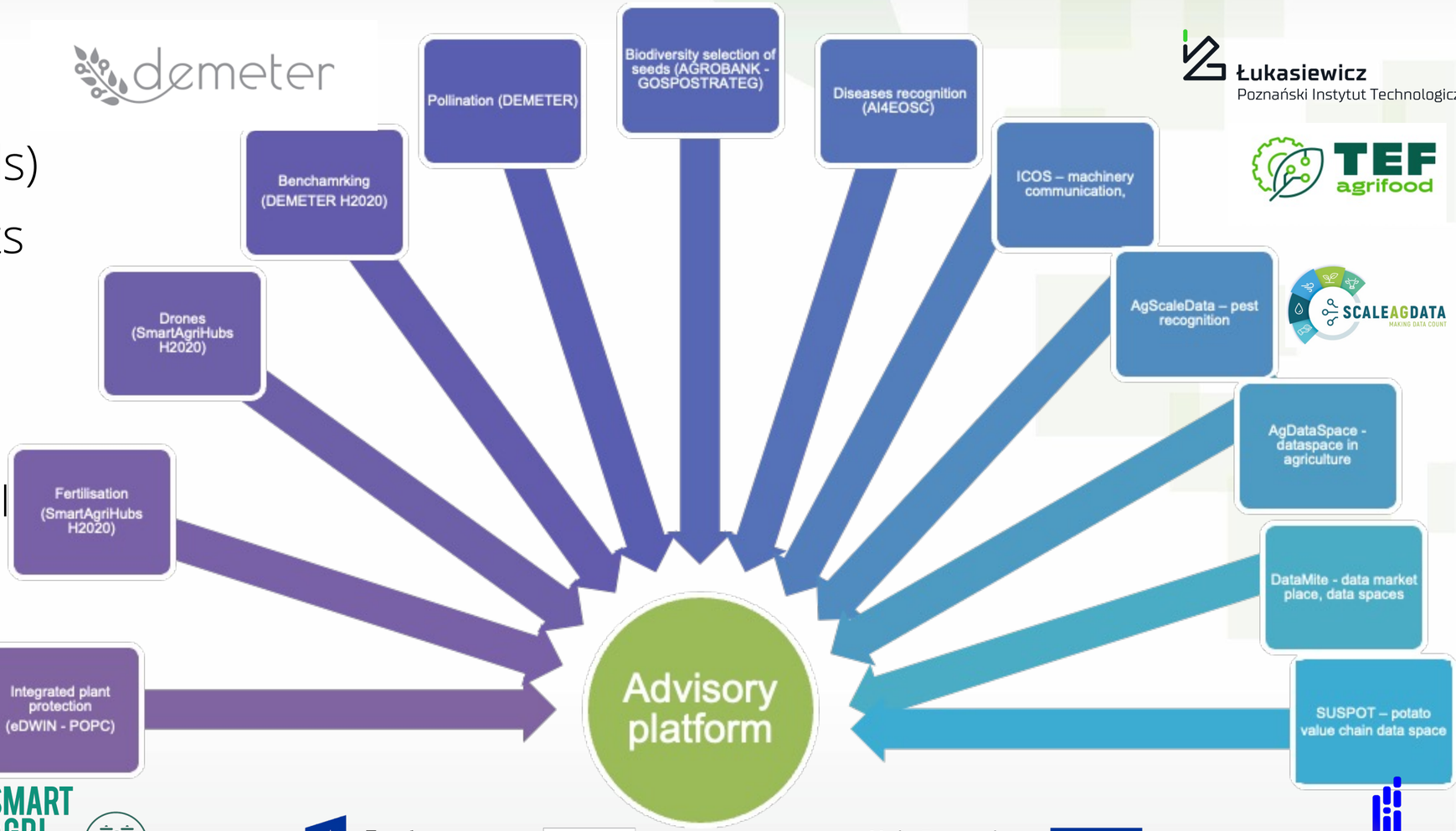
Started: 2019
Launch: 06.2022

National IT advisory platform for plant protection for farmers and public advisory

Modules:

- Virtual farm (with dashboards)
- Tracing the origin of products
- Risk reporting
- Sharing meteorological data
  - Integrates 500+ agrometeo stations and 20 phenological observation stations





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DATAMITE - DATA Monetization, Interoperability, Trading & Exchange

Connecting eDWIN to datamarket

Started: 01.01.2023

Goal:

- To initate the creation of the dataspace for agriculture in local ecosysystem and to expose the data in a form of datamarketplace
- The DATAMITE framework will provide some of the necessary mechanisms

Key outcomes:

- Towards dataspace: The mechanism for the collaboration in a trusted way between set of the companies and institutions
- Tools for assessing the data quality, improving data quality and data sharing
- Inclusion in DataMarketplace: the way to monetise data

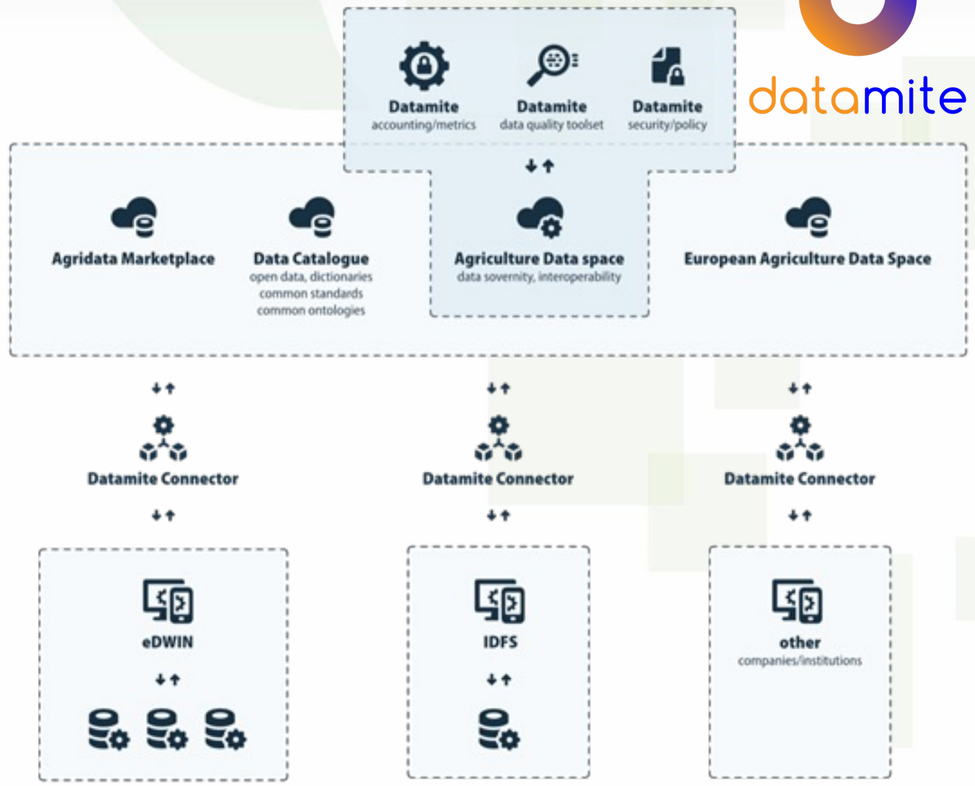
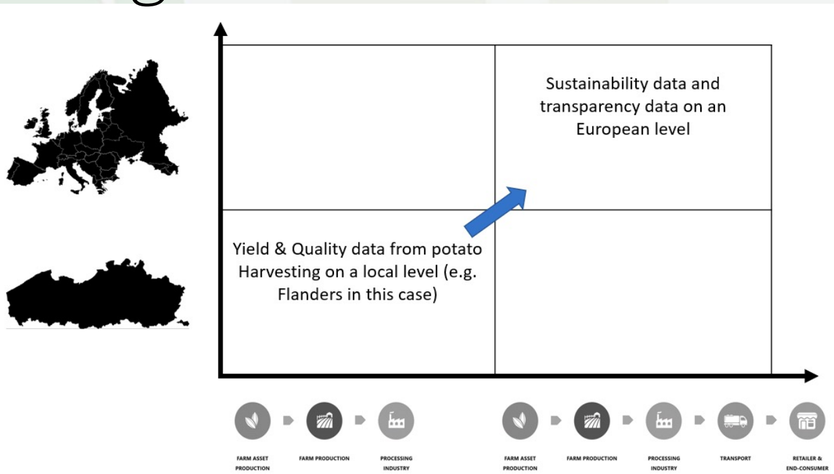


Figure 9: Agriculture data and services integration

SUSPOT

Starting: Nov 2023

Transparency and sustainability in the potato processing chain from F2F through data space and data sharing technologies

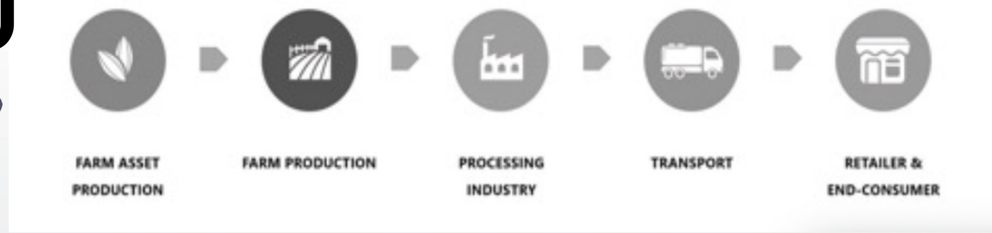


Develop, test and use SoA data sharing technologies in the potato value chain from producer to consumer

- to implement data driven decision making and to increase transparency and sustainability at EU scale.

Key outcomes:

- Systemic Innovation Demonstrator (SID) : brings together key stakeholder (farmers, manufacturers, potato processing, retail)
- Integrated Sustainability Tool (IST): builds on the IS models and the data and the information collected via the SID data space
  - provide stakeholders with data and models that can support them on the design of climate neutral and overall sustainable potato supply chain



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Thank you

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