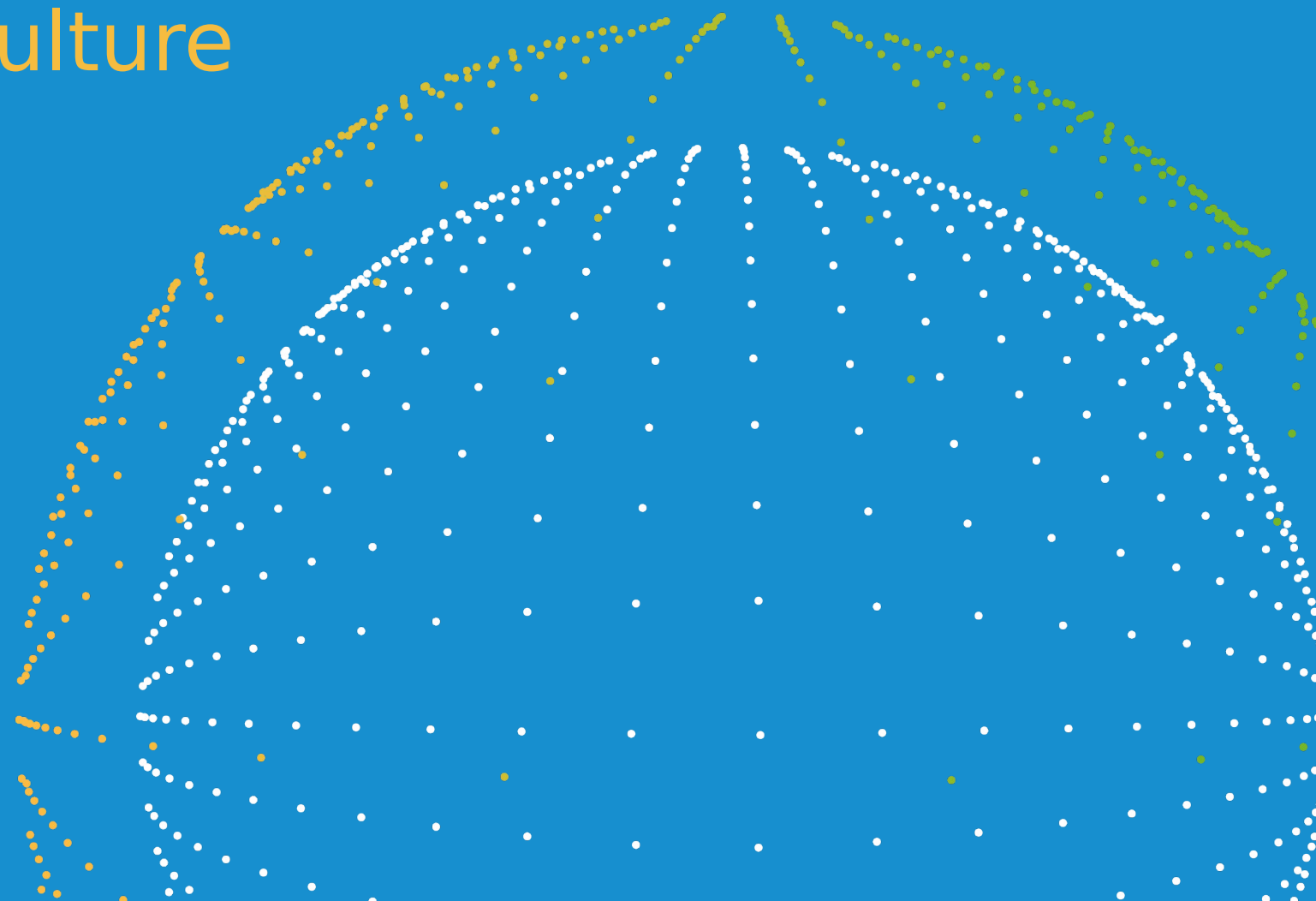


Data Spaces Symposium

Data spaces in action:
from cities to agriculture

Andrea Cruciani
CEO TeamDev & Agriculus





Industry 4.0
Big Data Analysis
A.I.

GIS & Mapping
Processes Automation



Internet of
Things

TEAMDEV
ECOSYSTEM

Agritech
Remote Sensing



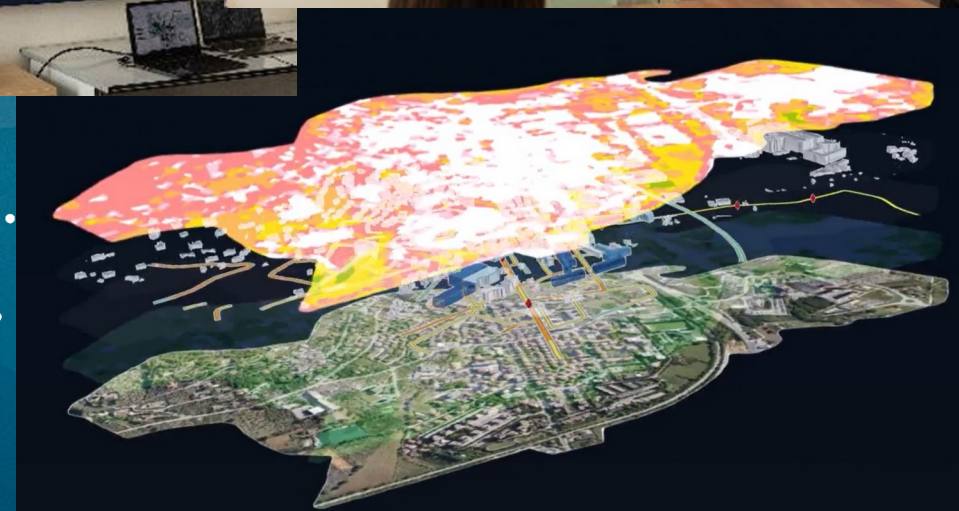
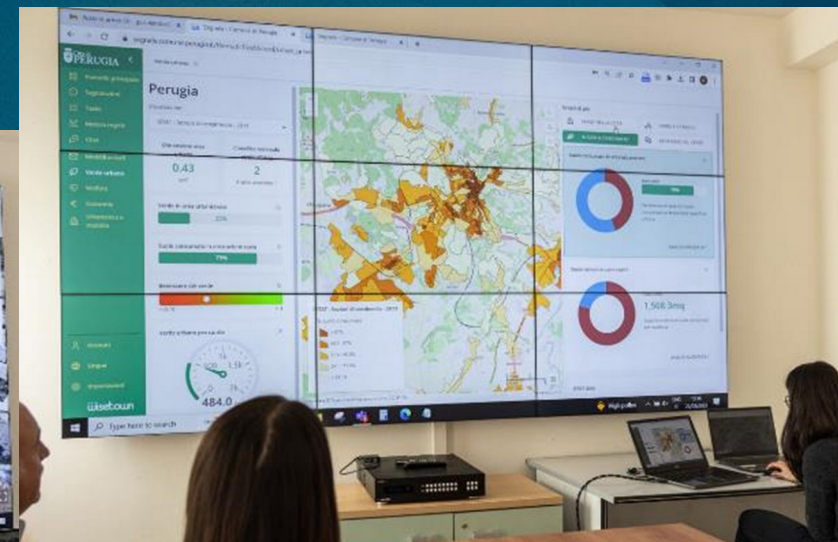
Smart City
Solutions

Research & Innovation
Training & Consulting



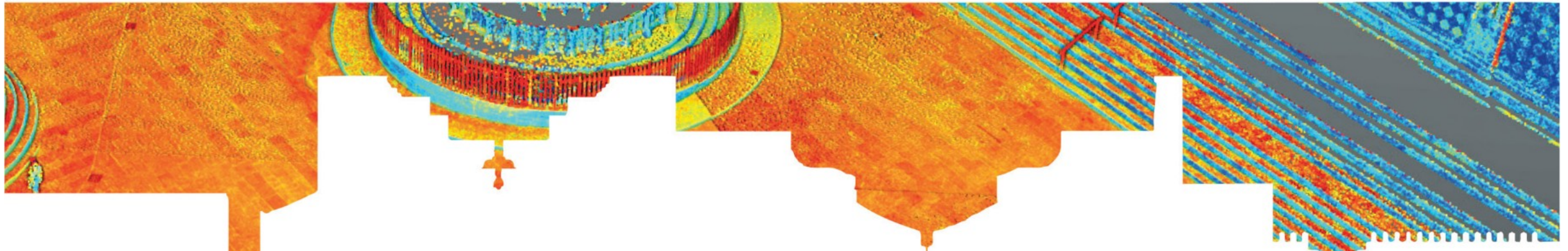
WiseTown Digital Twin

- **Organize and analyze** large amounts of geospatial data and **identify patterns or trends**
- **allows running forecasts and simulations** to assess the impacts of urban decisions
- **offers a real-time view** of the urban environment
- an immersive **3D virtual system**



PERUGIA

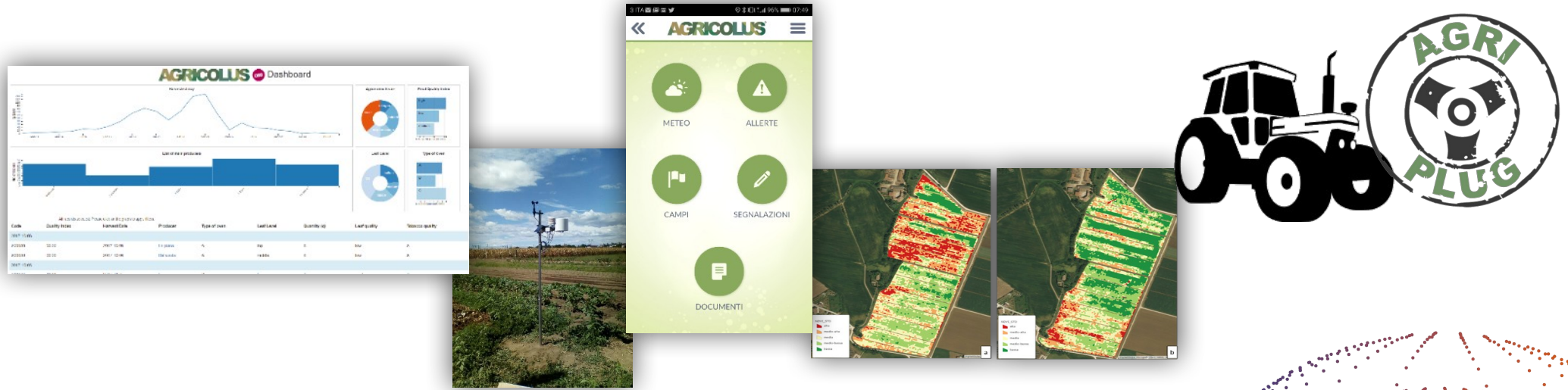
DIGITAL TWIN



wisetown

Innovative technologies for agriculture.

A SINGLE SAAS CLOUD PLATFORM



**Field
mapping**



**Satellite
Imagery**



**Forecast
models**



**Decision
support -
DSS**



Sensors



**Precision
farming**

Proprietary technologies, developed by Agricolus' agronomists and IT experts.

AGRICOLUS

PREVISIONI METEO



VITE MONITORAGGIO QUALITÀ E QUANTITÀ

18.00°Brix	9.97	8.7
15.30°Kmw	Alcool	PH
9.96°Bé	potenziale	

10	150gr
N. grappoli	Peso grappolo

INDICI DI STRESS IDRICO **NDMI**

-0.20	-0.13	0.03
min	med	max

INDICI DI VIGORIA **NDVI**

0.07	0.16	0.24
min	med	max

GESTIONE ATTIVITÀ

MONITORAGGIO TRAPPOLE

Stato: in lavorazione
Operatore: Mario Bianchi
Costo operazione: 180€

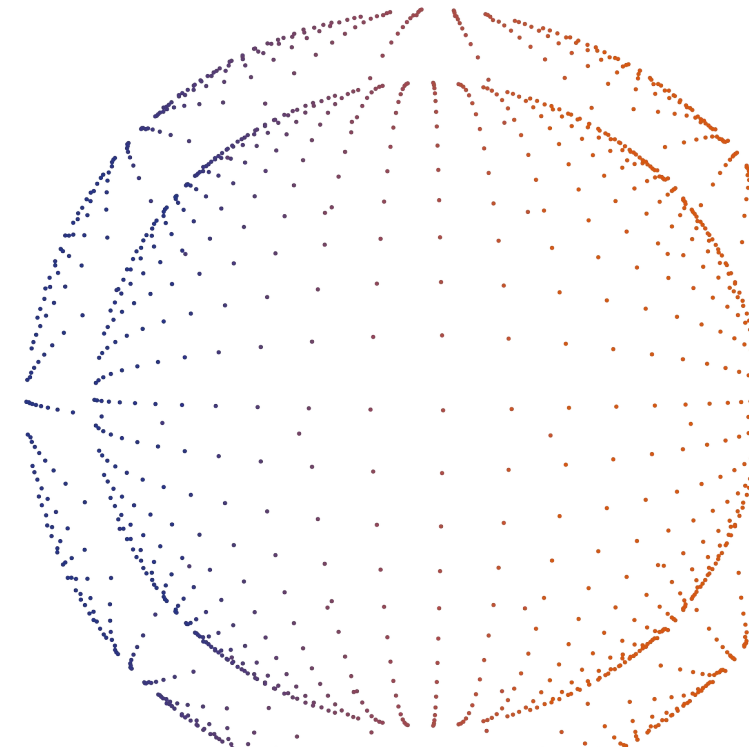
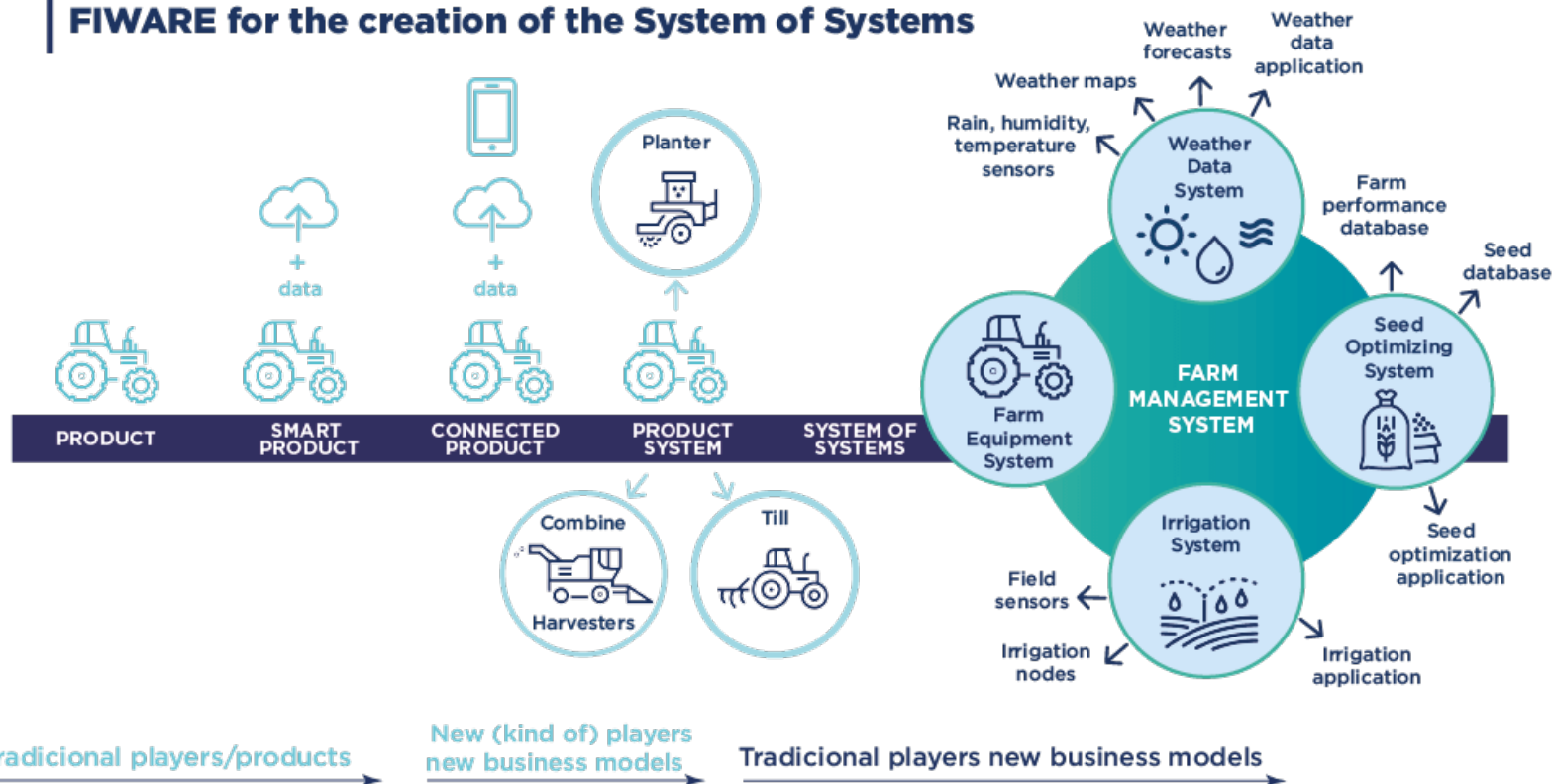


ALLERTA NOTTUA GIALLA
Verificare presenza larve

Smart Agriculture - main needs

- Data interoperability: common API for communication and common data models for interoperability
- Traceability of data exchange and provenance (lots, stakeholders of the supply chain, plant protection products used)

FIWARE for the creation of the System of Systems

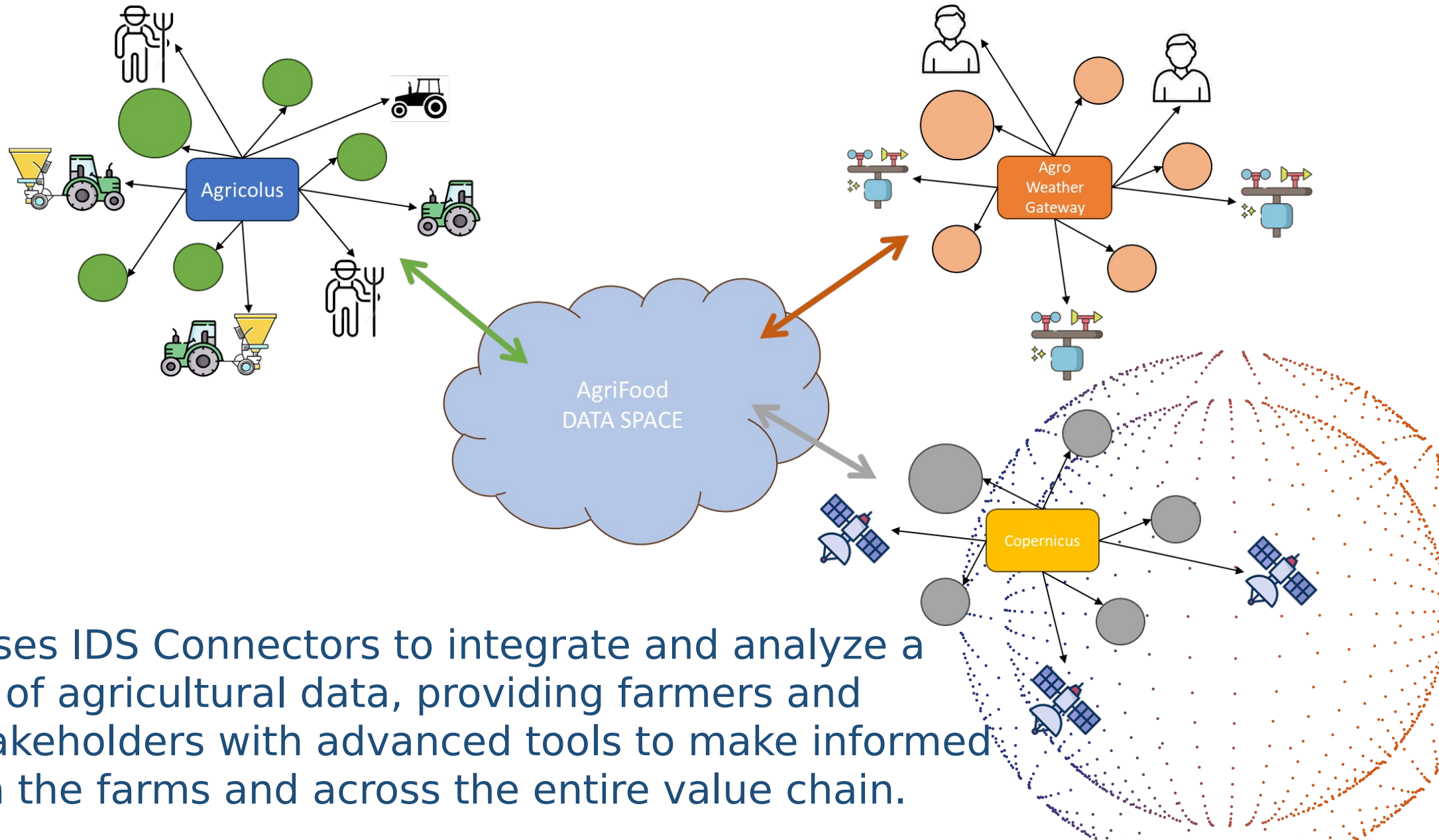


Digital Twin - main needs

- Data interoperability: common API for communication and common data models for interoperability
- Data sovereignty and trust: common standards for users identity, truthfulness, policies, data access and usage control
- Generating value from data sharing, metadata, publication and discovery of the data
- Open data
- Trust and cooperation between public stakeholders

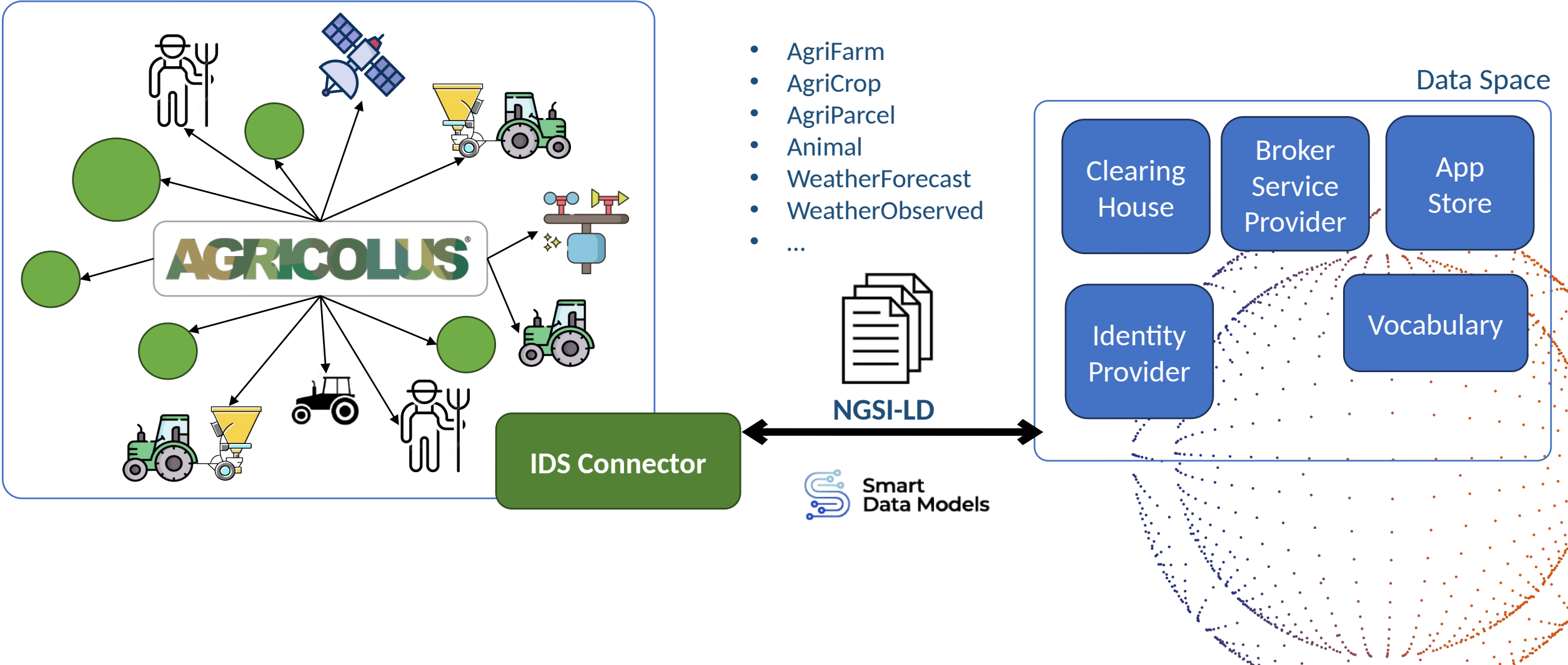


Real life case study in Agriculture



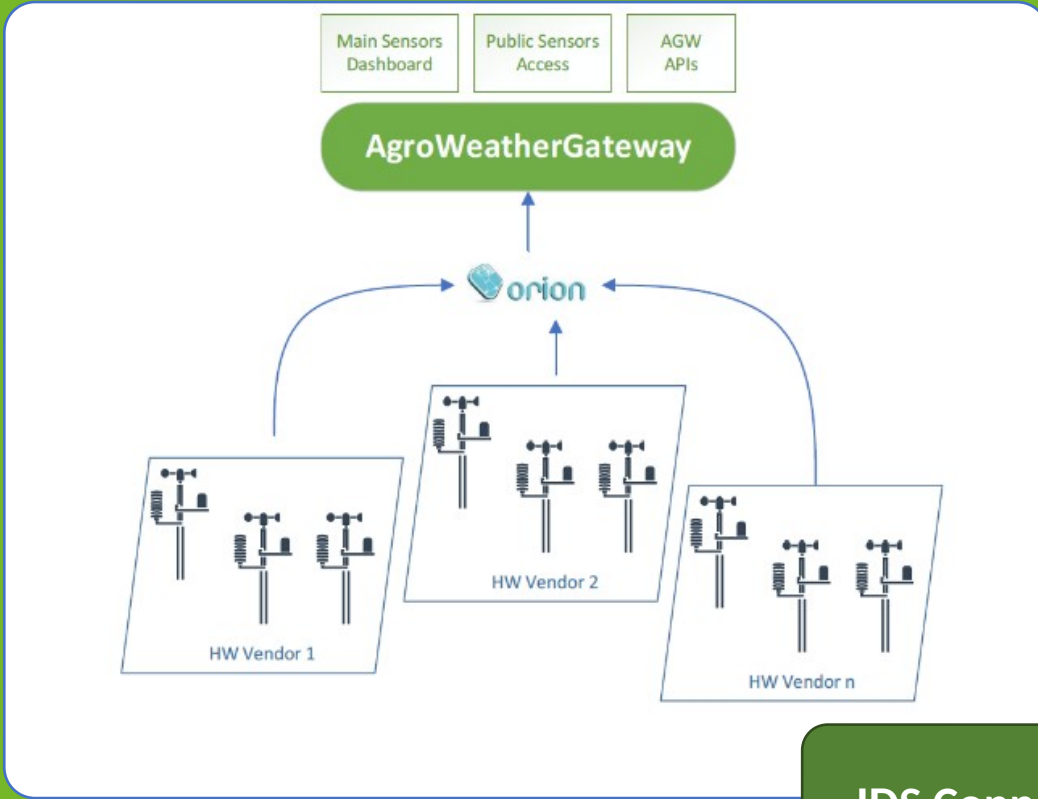
Agricolus uses IDS Connectors to integrate and analyze a wide range of agricultural data, providing farmers and agrifood stakeholders with advanced tools to make informed decisions in the farms and across the entire value chain.

Agricolus can act as Data Provider and Data Consumer



Next steps: FIWARE AGRIGATEWAYS integration

- Data harmonization on NGSI-LD Data Models (updating Weather Observed Data Model)
- APIs for data access
- Admin and users frontend with dashboards and insights on sensors



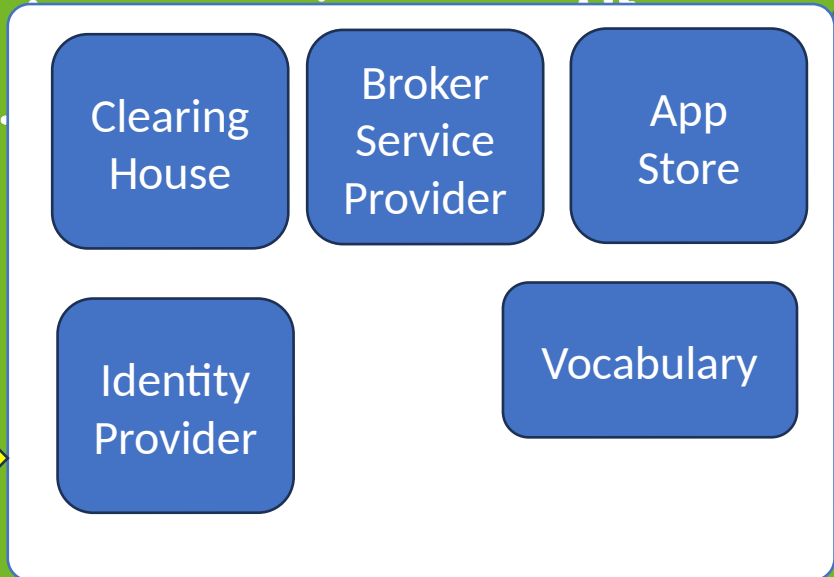
- WeatherForecast
- WeatherObserved
- ...

Smart Data Models



NGSI-LD

IDS Connector



Data Space

A Sared set of Components for both the domains

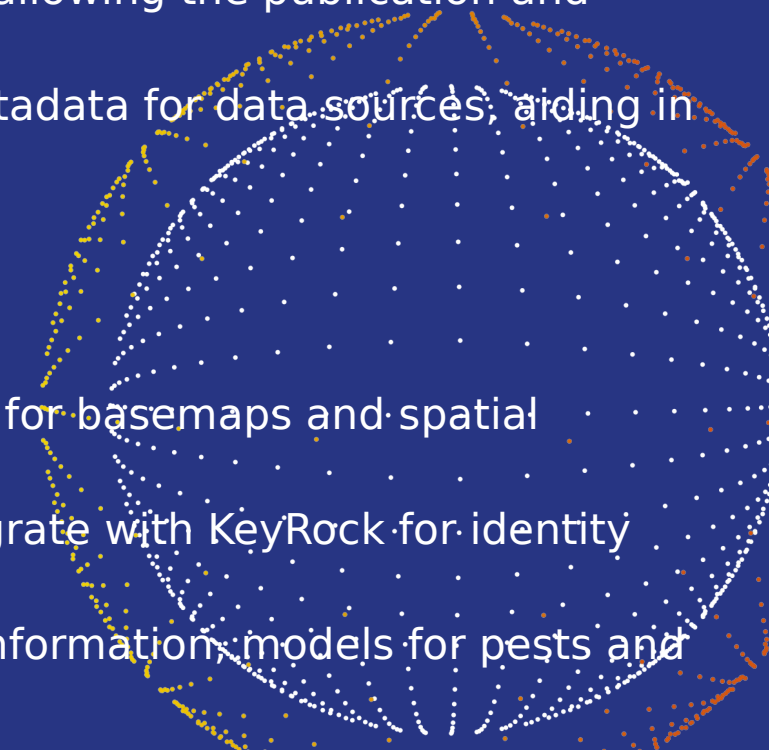


AGRICOLUS

- **Orion Context Broker:** As the central element of the architecture, it will manage context information in a publish/subscribe model, enabling the integration and communication of information from various sources.
- **IoT Agents:** For integration with IoT devices and sensors used in agriculture/digital twin, translating different protocols into NGSI standard used by the Orion Context Broker.
- **System Adapters:** Serving as mediators between data sources such as IoT, enterprise systems, and the Orion Context Broker.
- **Data/App Store (BAE):** For the management of data services and applications, allowing the publication and monetization of digital assets within the data space.
- **NGSI Registry:** As part of the Broker component, it would store and manage metadata for data sources, aiding in discovery and access control.

Agricolus' architecture is based on microservices involving:

- **Cloud Platforms:** Azure for business logic and main storage, ESRI ArcGIS Online for basemaps and spatial analytics, and ONDA Dias for remote sensing data processing.
- **Authentication:** Utilizing OAuth2.0 for federated authentication, which can integrate with KeyRock for identity management.
- **Platform API Services:** Offering third-party services including remote sensing information, models for pests and disease forecast, phenological progress, and water needs.





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