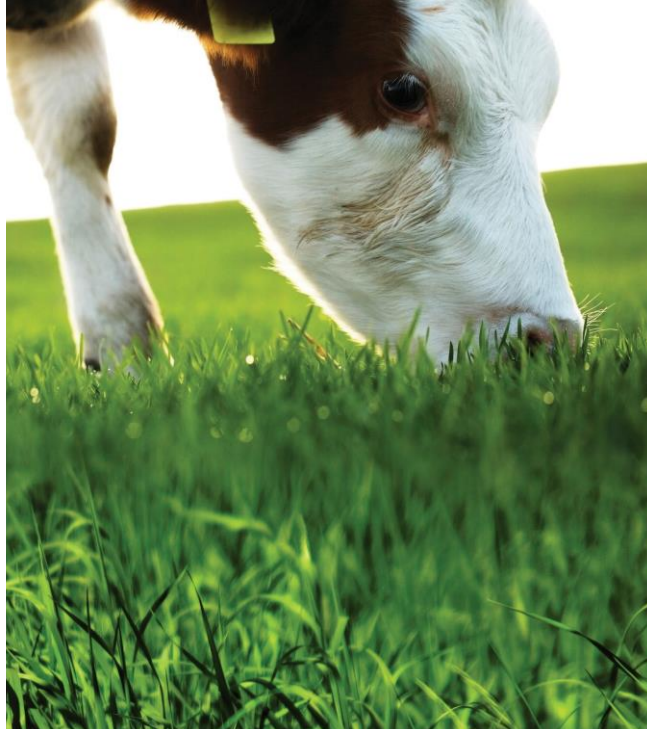
demeter

Learnings from 4 years of piloting digital technologies across European farms

Dr Srdjan Krčo

Hannover, 10/11/2023



DunavNET – Accelerating digital transformation

Established in 2006, HQ in Dublin (Ireland), development in Novi Sad (Serbia)

Co-founders of international IoT associations, **regular keynote speakers** at international events, EU and ITU experts for IoT

fleetNET's **FIRST customer** in 2011

TagItSmart, €7mil. IoT project, managed by DNET, started 2016

Collaboration with **Microsoft** started 2015

glueNET with **Henkel** since 2018, deployments in Heineken and Carlsberg

First AI solution for poultry farms deployed 2018

Working with Africa, IoT and entrepreneurship **(ACEIoT)**

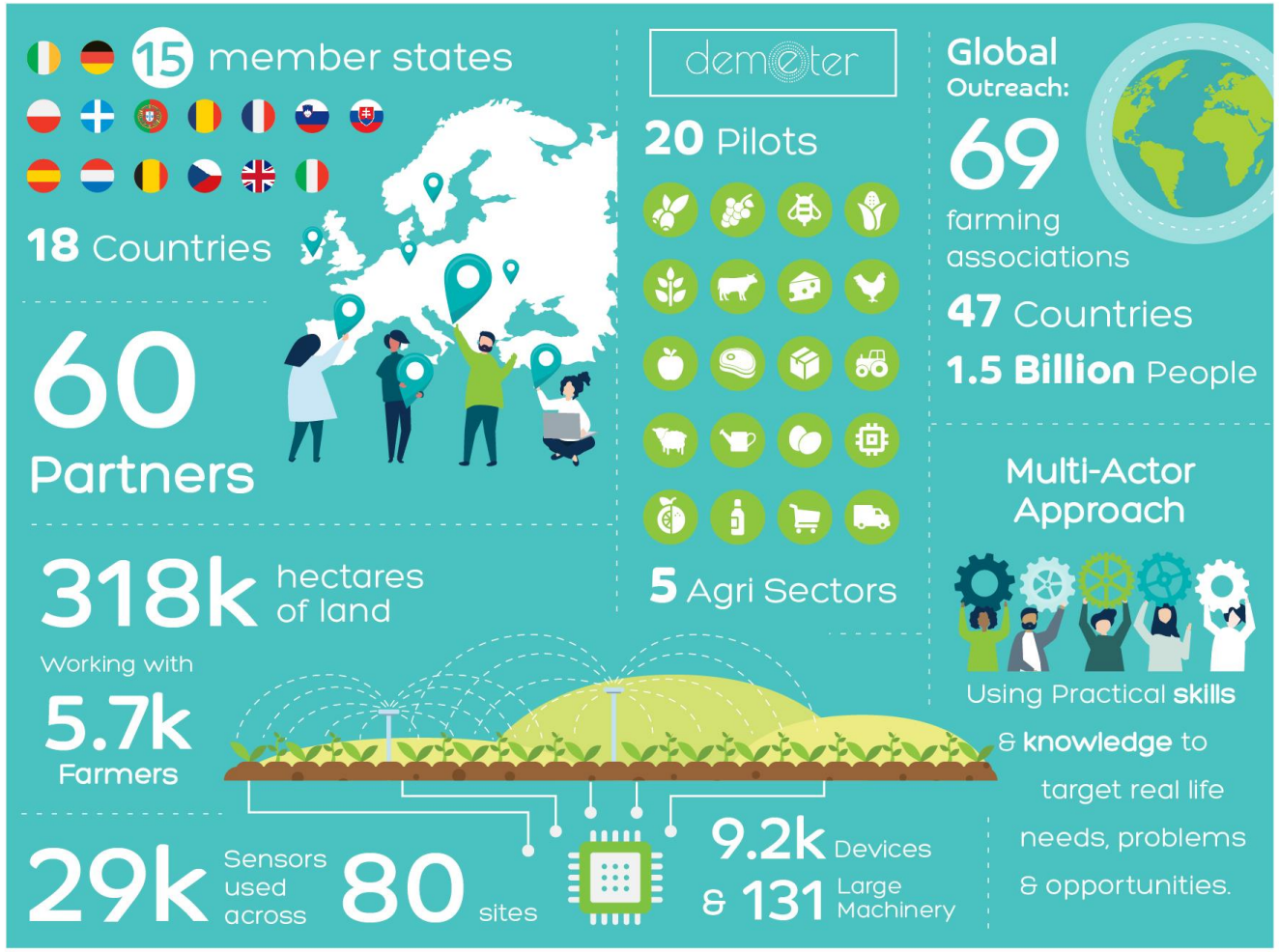
Collaboration with **SAS**, since 2019

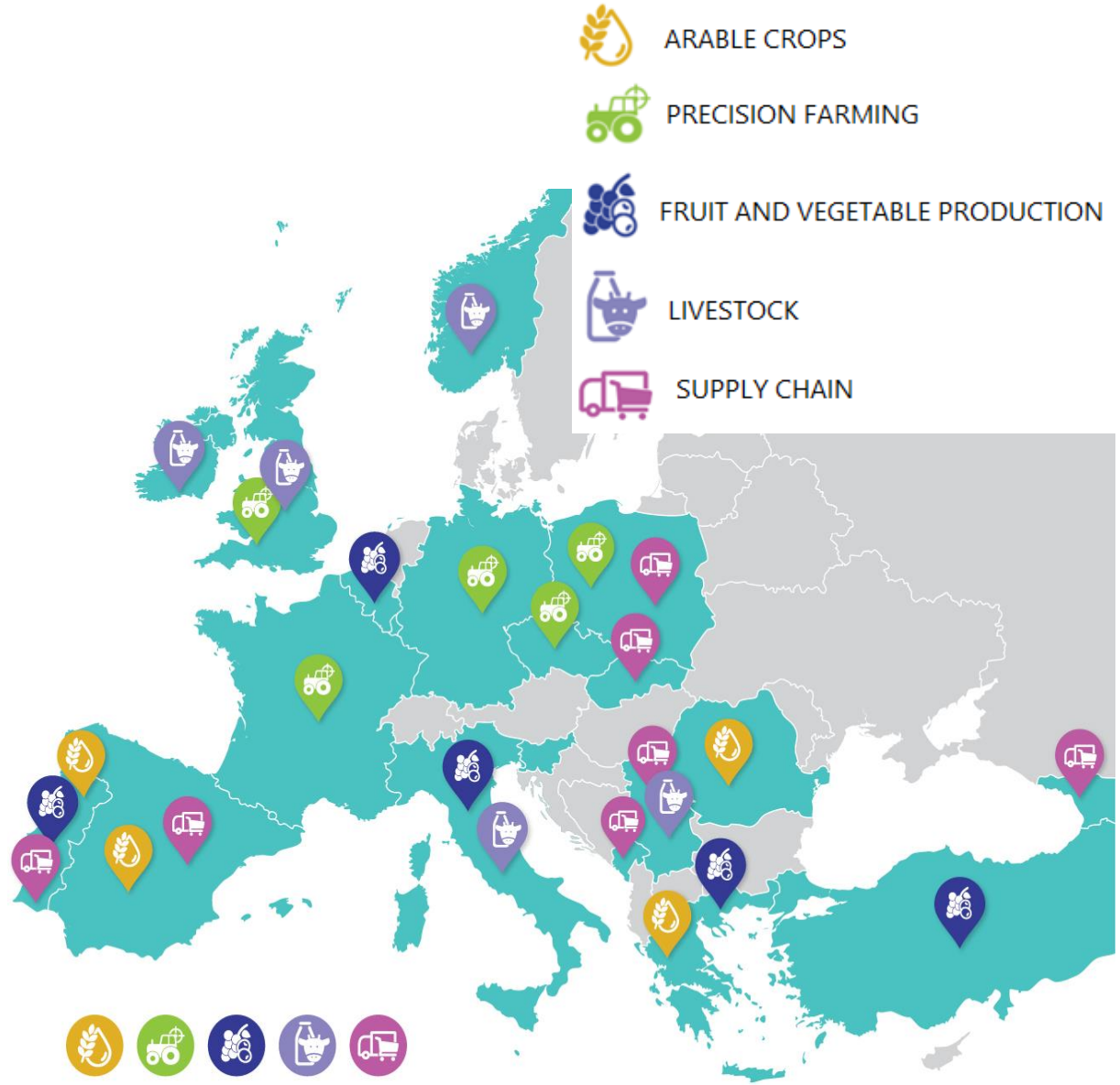
Invested over 5 mil. EUR into **creating own IPR** in IoT/AI domain

Spin-off smart city solutions into a joint venture, 2021

30 **IoT developers** and experts

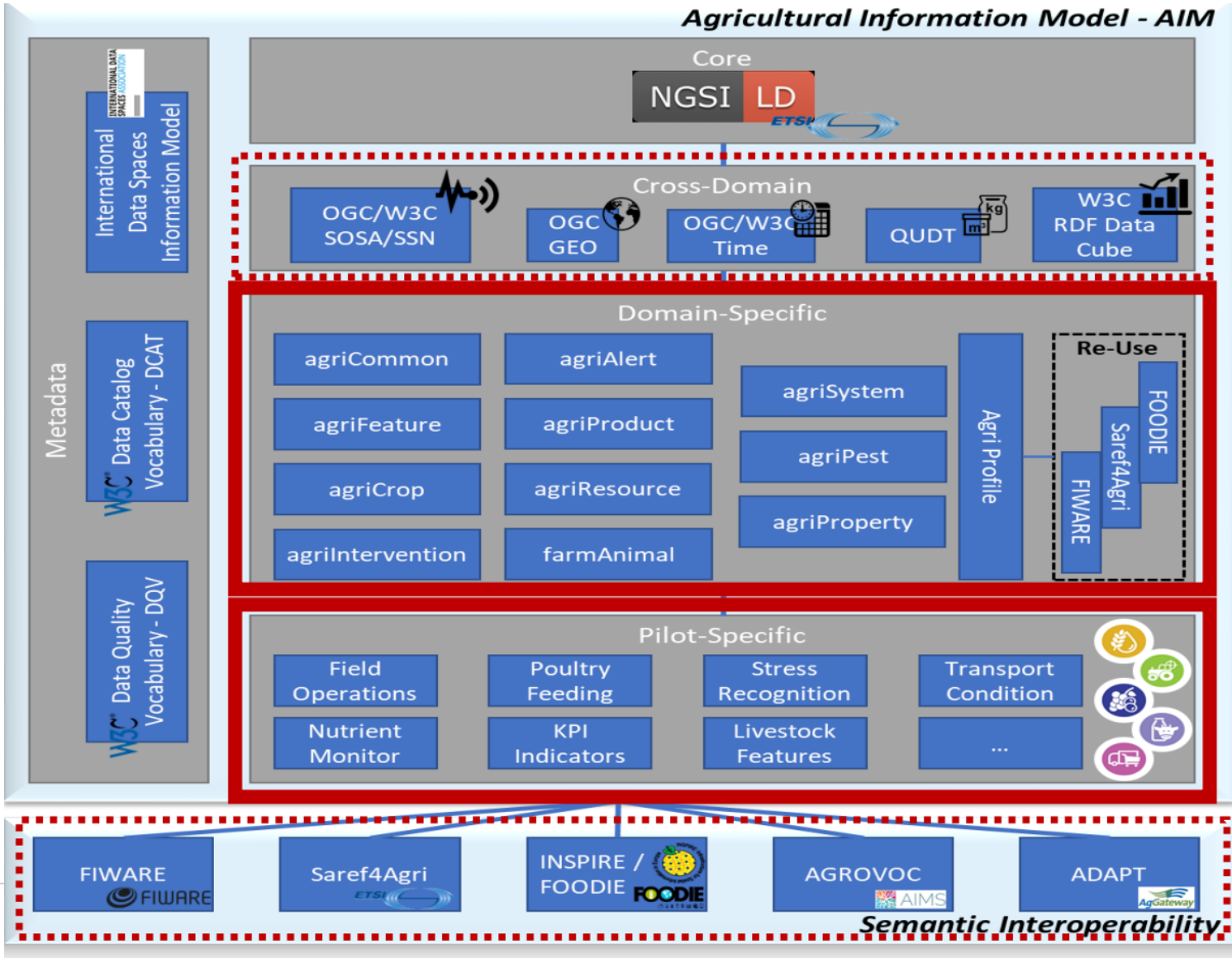
DEMETER overview





AIM – Agricultural Information Model

- Enabling a semantic interoperability data space
- Semantic mappings to FOODON and eCrop and realigned to FIWARE (SmartDataModels) and SAREF/SAREF4Agri



In-Service Condition Monitoring of Agricultural Machinery

Challenge:

- Demonstrate the potential of an onboard in-service condition monitoring of agricultural machinery.
- Monitoring of engine and after-treatment functionality to check if everything is working correctly.

Solution/Innovation:

- Engine and after-treatment data logged with 10 Hz in real time and analyzed
- Results visualized, easy to understand conditions of the machines

Deployed in: Germany

- *Bavarian State Research Center for Agriculture (> 100 ha)*
- *Hofgut Neumühle (> 100 ha)*

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Image Source: https://commons.wikimedia.org/wiki/File:Deutschlandkarte_(Bunt).svg

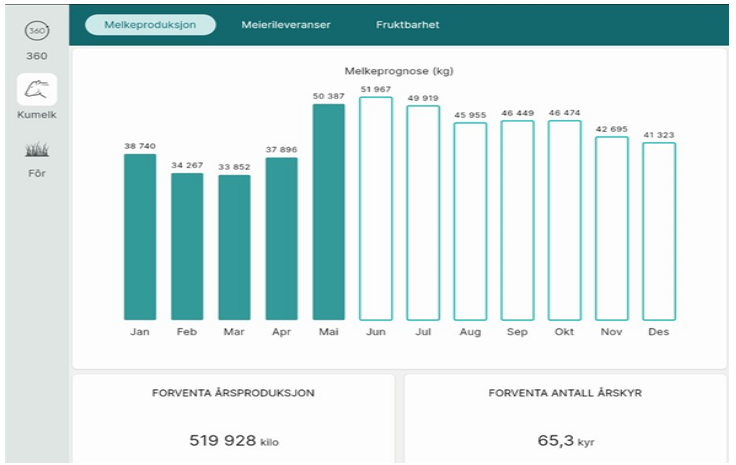
Dairy Farmers Dashboard for the entire milk and meat production value chain

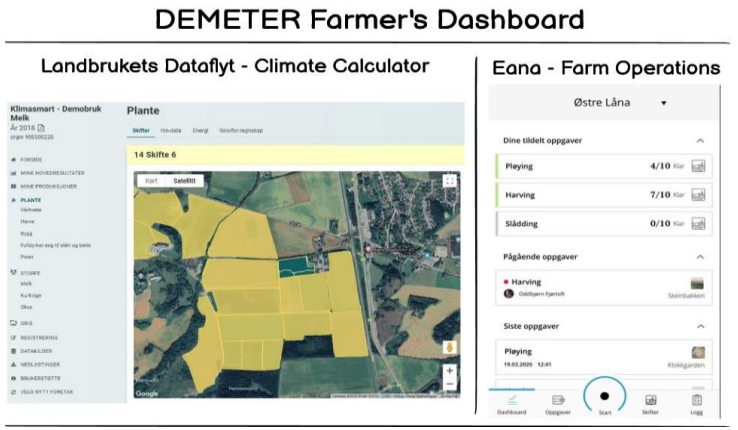
Challenge:

- **Digital overload:** Farmers troubles with an increasing number of digital solutions and production requirements, including greenhouse emissions.
- **Sensor data and AI** adds to this complexity

Solution:

- **A farmer's digital dashboard** based on data sharing among companies the farmers cooperate with, that support:
  - milk yield prediction and herd management for dairy farmers
  - measurement of greenhouse emissions on the farm
  - benchmarking and visualization components for overview on the farm





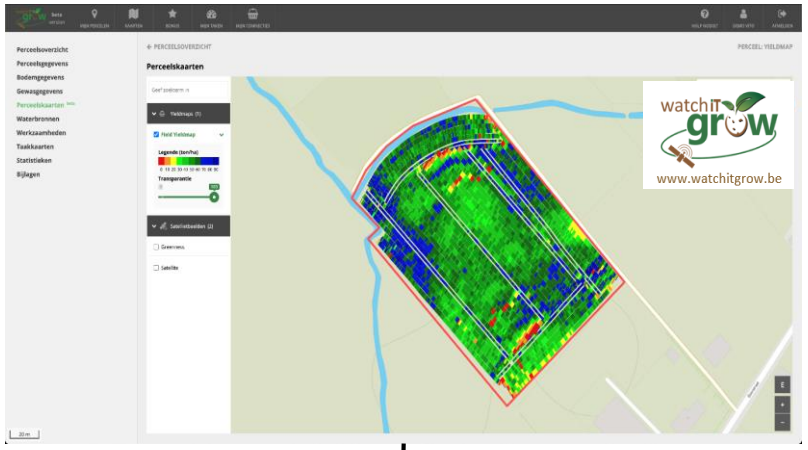
Open platform for improved crop monitoring in potato farms

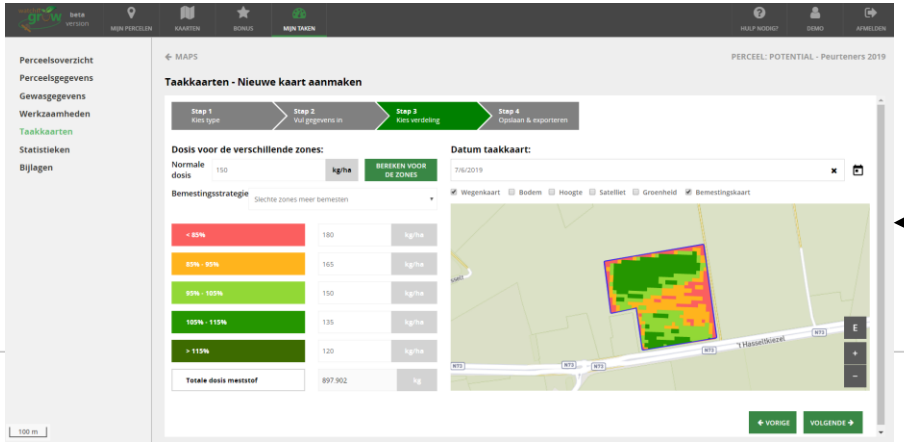
Challenge:

- More connected field machinery → make sense of the data!
- Need for easily accessible decision support tools for farmers

Solution/Innovation:

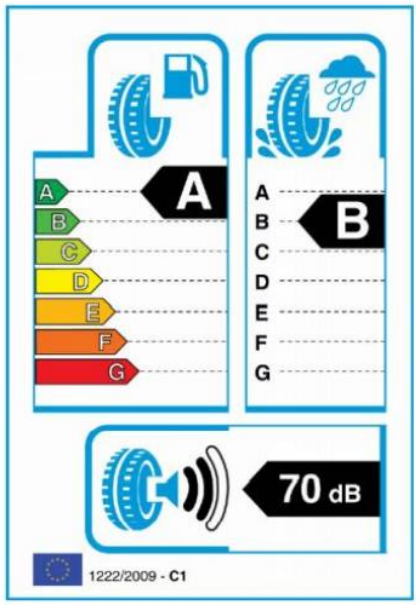
- Automatic and standardized exchange of yield data between AVR Connect and WatchITgrow platforms using AIM standards
  - Visualize AVR yield maps
  - Compare yield and other data (satellite images, soil maps, weather data)
  - Create task maps for variable rate fertilization or irrigation
  - Get yield estimates for their fields



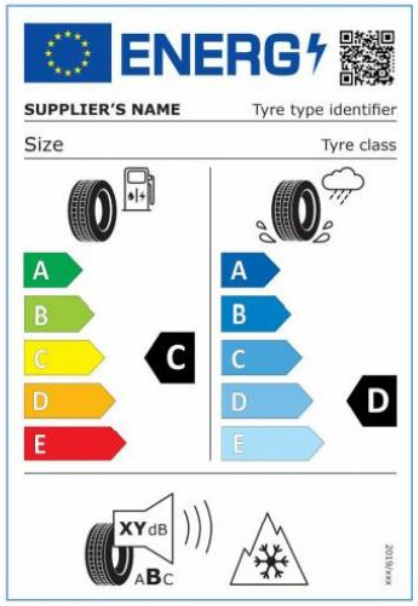


Supply Chain Transparency (poultry and winemaking sectors)

2012 EU Tyre Label
Regulation 1222/2009



2021 EU Tyre Label
Regulation 2020/740



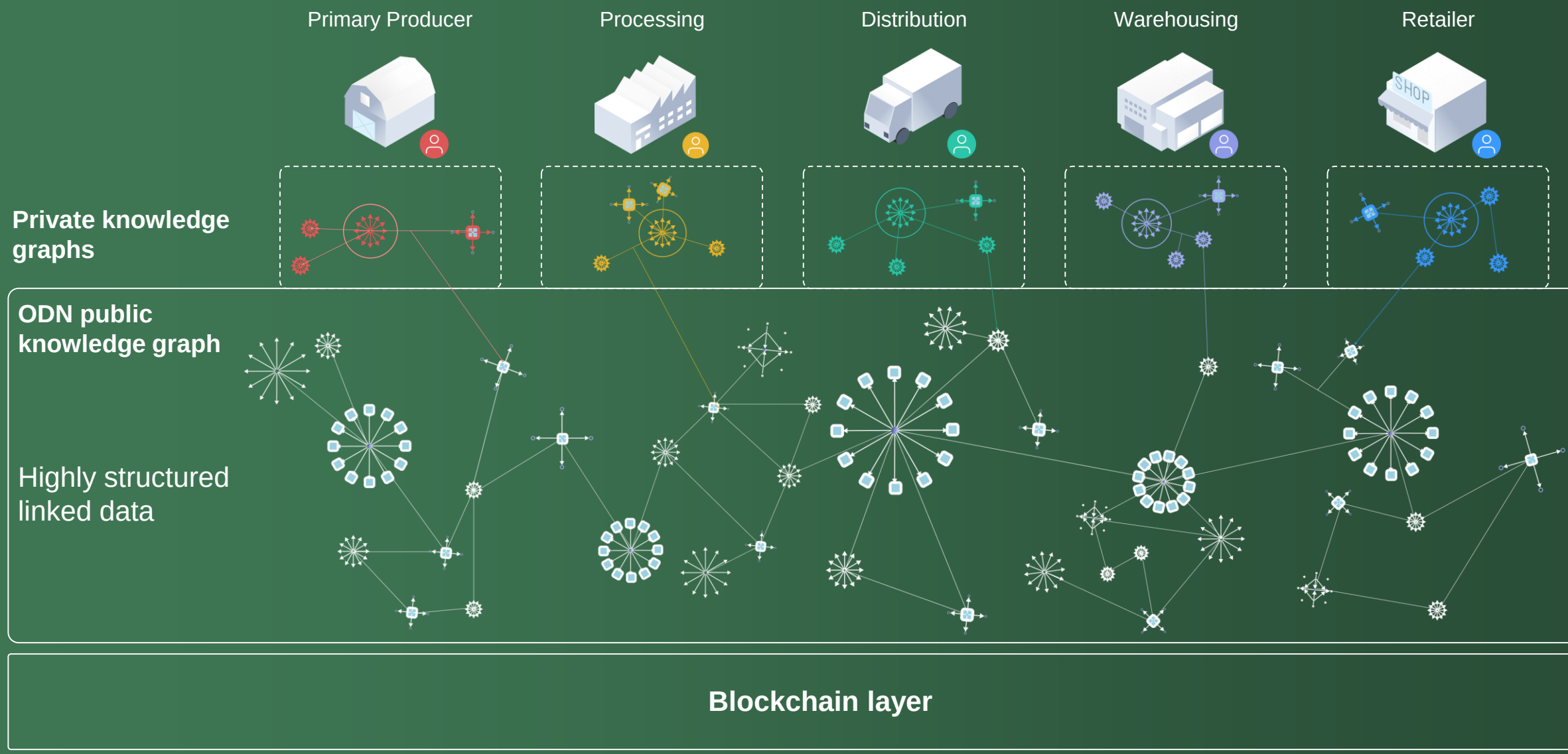
Batch number:	124
Number of bottles:	600
Sulfur [g]:	
Type of wine:	Red
Location:	
Crop type:	
Variety:	Vranac Pro Corde
Pesticides - the last treatment:	20.8.2023.
Harvest date:	30.9.2023.
Sugar content [%]:	
Acid:	
pH:	
Temperature [°C]:	13
Energy label:	

Low environment impact
Medium environment impact
High environment impact

Producer:	Agroprodukt Šinković
Type:	MeatProvenance
Hybrid:	Ros 308
Cycle:	30.3.2022.
Environmental conditions:	Optimalni
Vaccines:	Da
Transport conditions:	Optimalni
Energy label:	

Low environment impact
Medium environment impact
High environment impact

Integrating data through the Decentralized Knowledge Graph



Collaborate closely with farmers

Farmers are busy

- *Recognize and accommodate farmers' time constraints, requiring patience, flexibility.*
- *Establish good communication channels with farmers.*
- *Actively involve farmers for insights and feedback.*
- *Be persistent ☺.*

Support and training

- *Provide guidance, explanations, training.*
- *Examples from practice speak more than hours of training.*

Field experience matters (a lot)

Developers, get your hands (and boots) dirty

- *You must experience it to understand it.*

Test before deployment

- *Test before deployment. Test before deployment. Test before deployment.*

Data is the new oil/gold/…treat it accordingly

Who owns data? What are you allowed to do with collected data?

- *Data ownership and usage agreements are needed.*

Collecting data from the field is not a simple task

- *Acknowledge the complexity and cost of data collection, including sensor selection and financial feasibility.*

Context does matter

- *Adequately describe data context to enable effective processing.*

Standards matter as well

- *Establish a common vocabulary for standardized data descriptions to ensure interoperability and scalability.*
- *Use AIM ☺*

Key lessons

- Collaborate closely with farmers
- Field experience matters (a lot)
- Data is the new oil/gold/…treat it accordingly

Digital farming portal: https://digitalfarming.eu

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