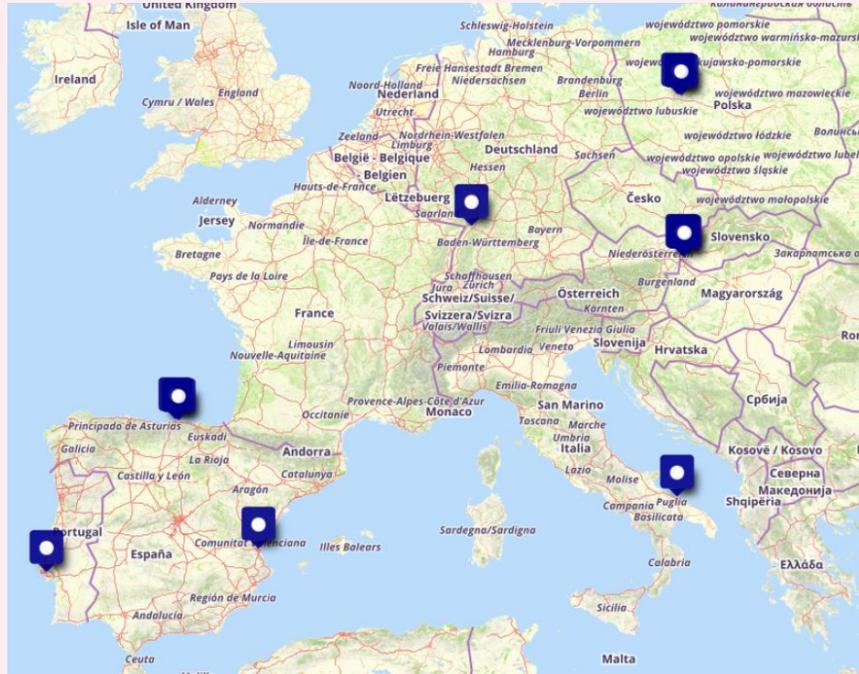


AI4 |  eosC

Artificial Intelligence for the #EOSC

Álvaro López García (aloga@ifca.unican.es)



AI4EOSC

Artificial Intelligence for the #EOSC

- Evolution of the DEEP Hybrid DataCloud platform
- HORIZON-INFRA-2021-EOSC-01-04 call
- Runs September 1st 2022 – August 2025 (36 months)
- 7 academic partners
+ 2 SME
+ 1 non-profit organization

Advanced features for distributed, federated, composite learning, metadata provenance, MLOps, event-driven data processing, and provision of AI/ML/DL services



Objectives

Objective 1

Provide feature rich services and platform to build and deploy custom AI applications in the EOSC

Objective 2

Enhance existing cloud services to support AI on distributed datasets, with a particular focus on federated learning

Objective 3

Deliver methods to compose AI tools, enabling the development of complex data-driven composite applications

Objective 4

Deliver an AI exchange in the context of the EOSC, enhancing and increasing the application offer currently available

Objective 5

Extend the service offer and the capabilities being offered through the EOSC portal, with focus on AI

Goal

Foster an AI exchange in the EOSC context, with added value, innovative and easily customizable services

Background and ecosystem

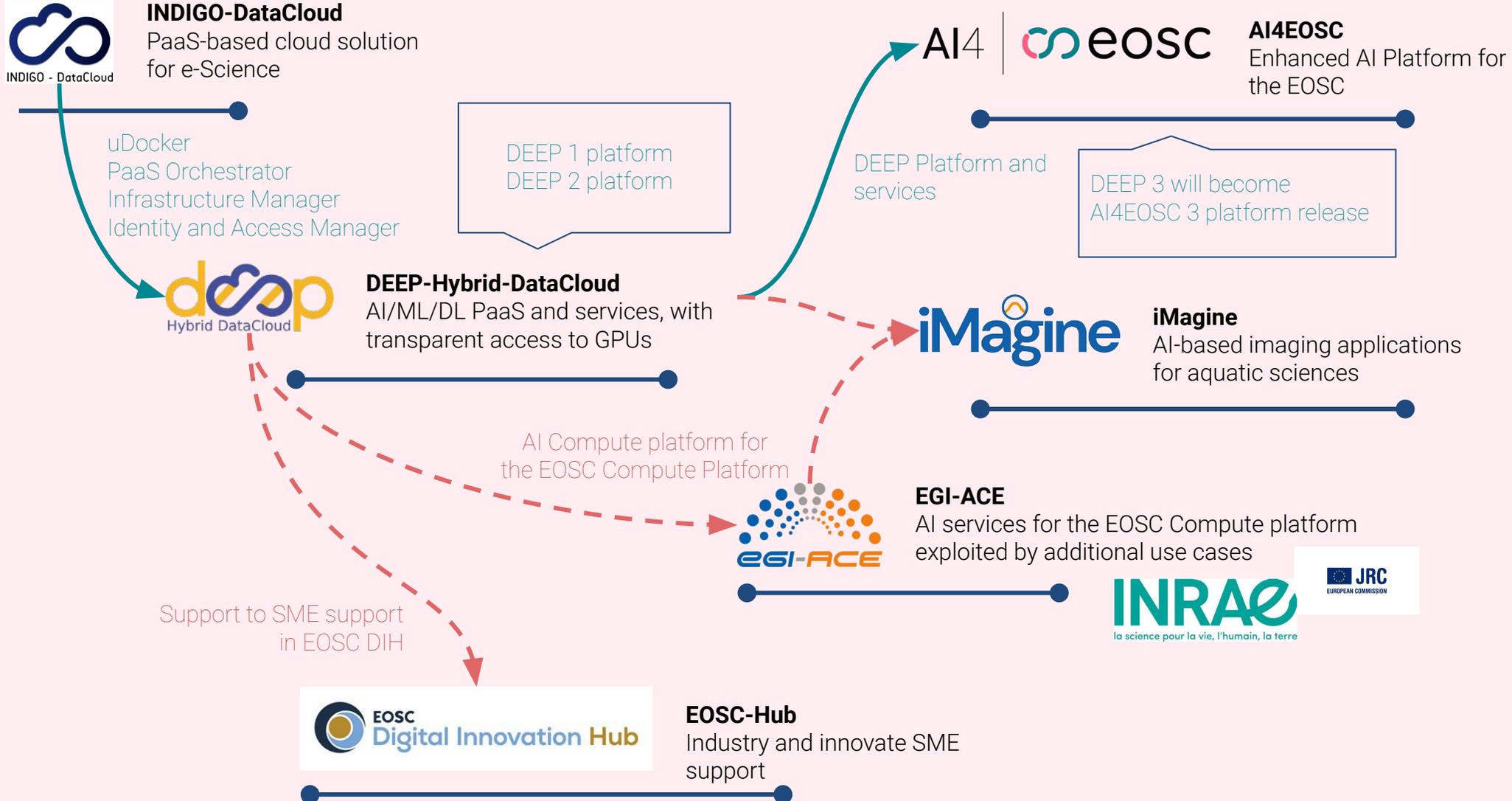
AI4

eosc



Co-funded by the European Union

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	...
------	------	------	------	------	------	------	------	------	------	------	-----



DEEP evolves in...

Training on single site,
centralized dataset expected

Single AI application, self
deployed or on serverless
computing

Central management of
onboarded sites, complex
on-premises deployment

AI4EOSC

Federated learning, split
learning, gossip learning,
making possible training on
decentralized datasets

Composite AI for complex AI
tools and applications through
function composition and
serverless computing

Enhanced onboarding of
resources, easier deployment
on-premises

(some) New features

Integration with privacy tools
(differential privacy, anonymity
checks)

ML pipeline composition and
workflows

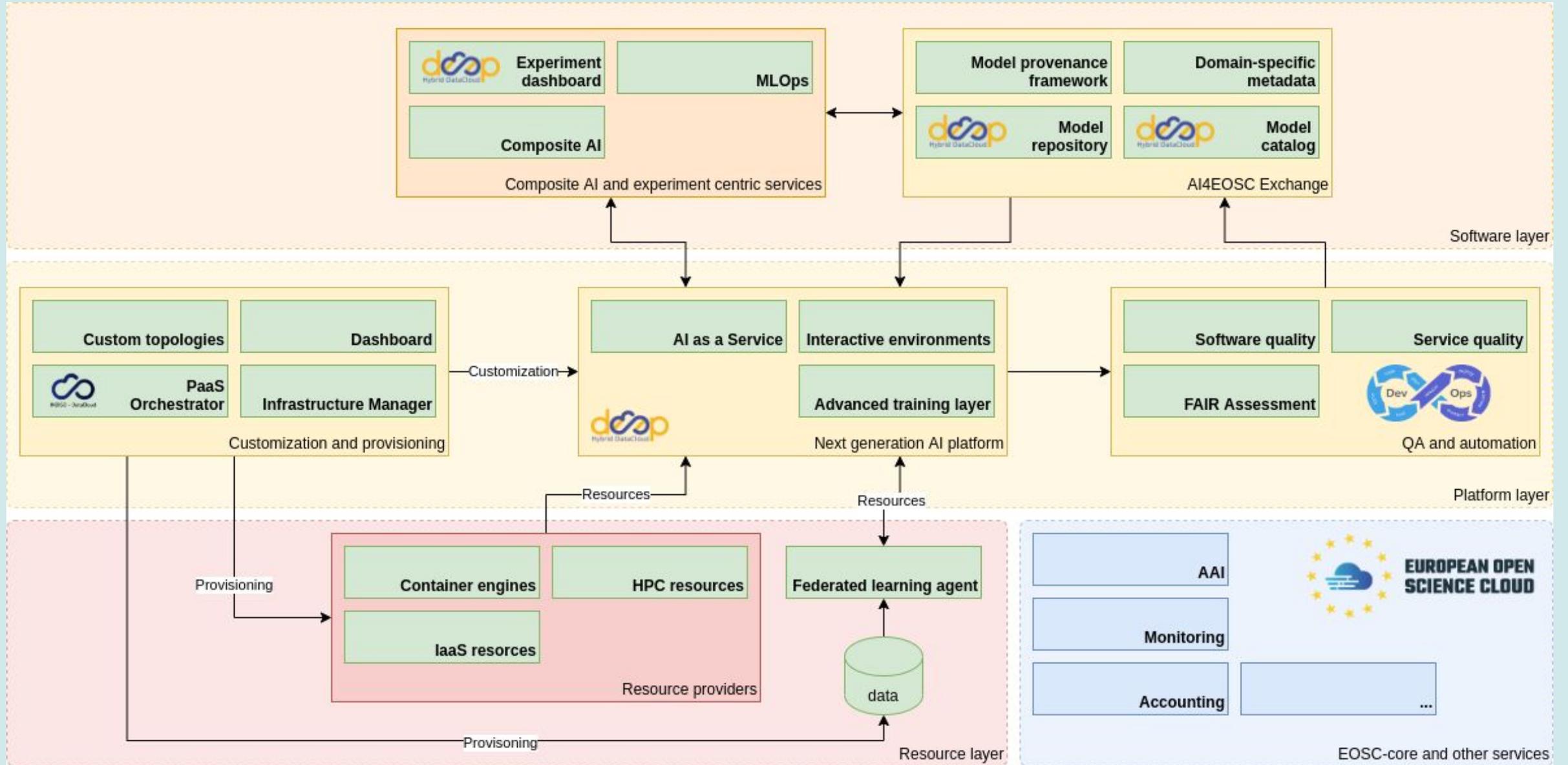
MLOps tools to monitor
deployed models (drift
detection, concept drift,
accuracy and performance)

Community standards for
models API (Kserve) following
OpenAPI specifications

Enhanced web user interface
for applications

Improved development
environment (VS Code,
JupyterLab)

AI4EOSC conceptual diagram



AI4EOSC: use cases



Agrometeorology

Integrated plant protection

Automated thermography

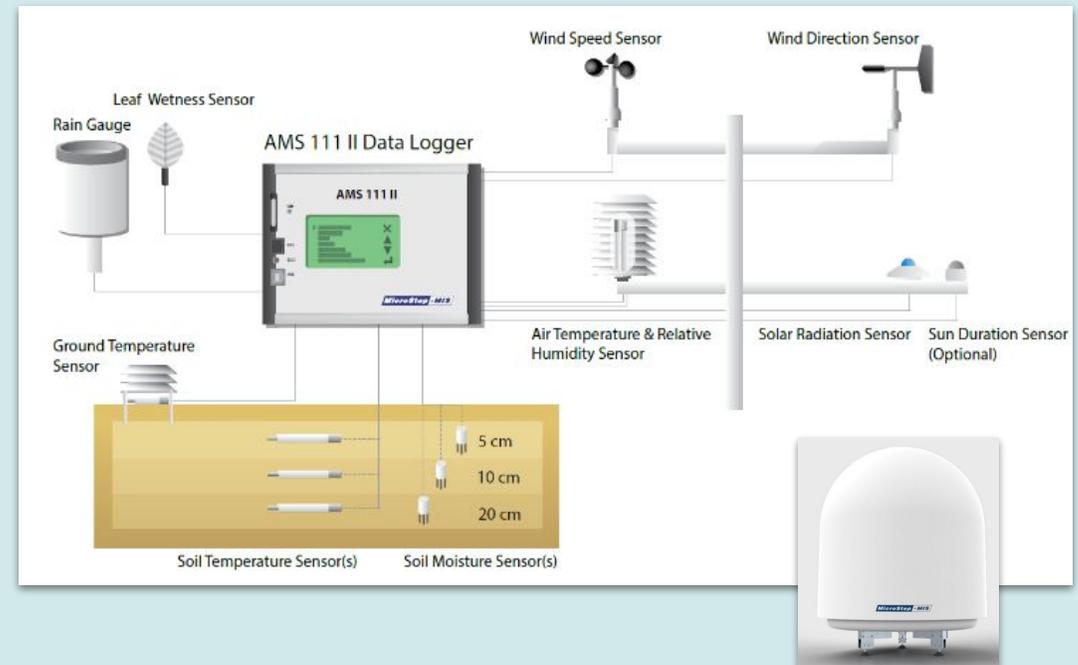
Agrometeorology

Aim: Usage of satellite imagery, in-site measurements, and weather forecasts to generate added-value products for improving farmers activity: e.g. prediction of phenological or pest development stages.

Currently: Measurement system - TRL9, prediction system - TRL3

Within AI4EOSC: Enhancement of the prediction subsystem following a Composite AI approach to combine the different machine learning models used for the different data sources

Partners: Microstep, IISAS, Predictia





Integrated plant protection

Aim: To determine the risk of disease and pests in agricultural crops and determine the phases of plant growth and the condition of crops. The developed AI models are going to be integrated into existing national advisory platforms, operated by WODR and PSNC.

Currently: WODR and PSNC operate a national advisory platform for farmers (eDWIN), which includes a network of meteorological ground stations, the Farm Management System, and ground observations of the occurrence of diseases and pests. The current solutions are based on predictive mathematical models.

Within AI4EOsc: The plan is to replace current mathematical models with ML/DL-based models in order to improve the precision. At the same time, they would be enhanced with greater precision by using satellite data.

Partners: WODR, PSNC



Automated Thermography

Aim: To identify heat losses and thermal bridges in buildings and infrastructures using drone-based images and ML/DL approach in order to provide a corresponding automated AI-based service.

Currently: The group owns a dataset of drone-based images on urban districts and drone-based thermal images on a campus district (ca. 0.8TB). The identification of thermal bridges on roofs is already possible using DL (TRL 4). The identification of leakages in district heating networks is possible too (TRL 5/6).

Within AI4EOSC: Targets enlargement of the training dataset, AI model improvement, optimisation of the workflows, and creation of a cloud-based automated service

Partners: KIT (IIP, SCC)



Kick-off meeting – 21/10/2022

AI4



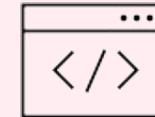
Co-funded by
the European Union



AI4EOSC



ai4eosc-po@listas.csic.es



ai4eosc.eu

↑↑ **Reach us!** ↑↑

Thank you for your attention

Project Coordinator: Álvaro López García
aloga@ifca.unican.es