



AI on-demand platform for regional interoperable DIHs Network

DIH4AI Coordination Team (Sergio Gusmeroli) <https://www.dih4ai.eu/>

AI on Demand Community Forum: the ICT49 Cluster
November 14th 2023



The DIH4AI Innovation Action

DURATION: 36 months (January 2021 – *ongoing*)

COORDINATOR: Politecnico di Milano

FUNDING: € 4,999,863 (2M Open Calls)

CONSORTIUM: 12 Partners from 6 countries

OPEN CALLS: 10+10 new DIH-driven SME-oriented

DIHs: 5 AI DIHs selected from AI DIH Network

EXPERIMENTS: 20+ AI Best Services implementations

<https://www.dih4ai.eu/>



The Consortium

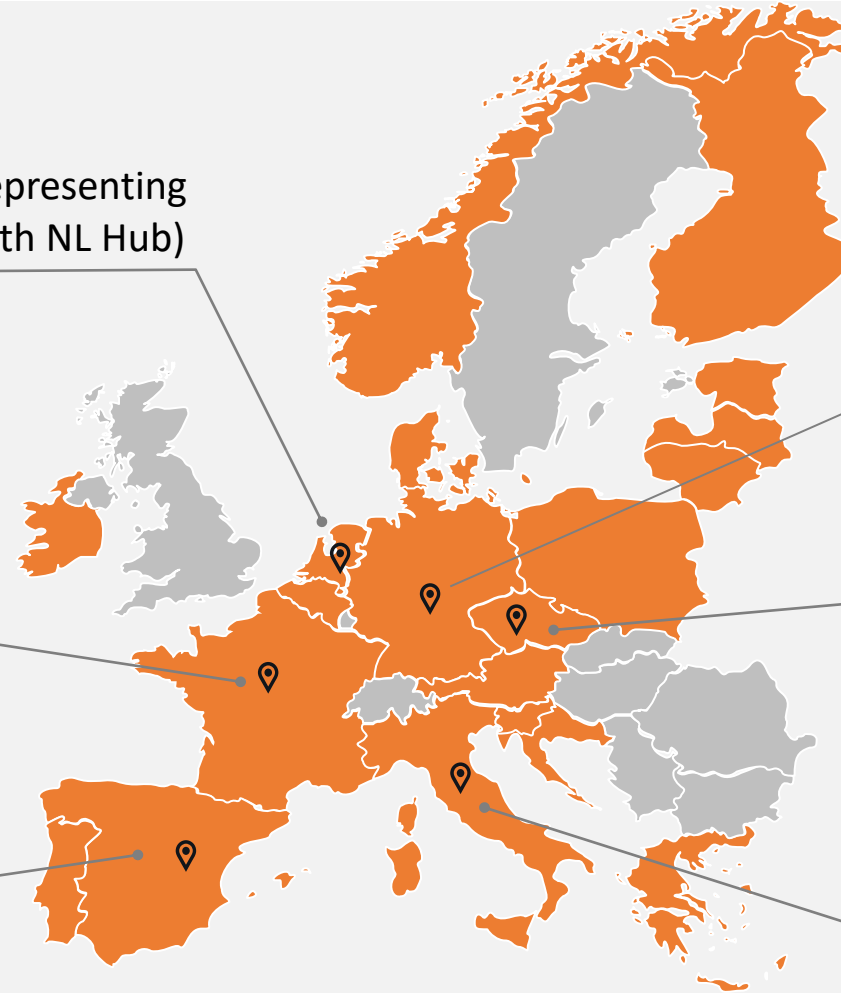
12 partners from 6 EU countries, covering 3 key dimensions:

- Regional specialization
- Methodological
- AI tech providers

TNO (representing the South NL Hub)

- **CEA** (representing the DIGIHALL Hub)
- **IMT Transfert**

- **INNOVALIA**
- **ATOS**



- **Fortiss** (representing the Munich Innovation Hub)
- **Fraunhofer IFF** (representing the DIH Saxony-Anhalt Hub)

- **CIIRC CTU** (representing the Czech Innovation Hub)

- **POLIMI** – Project Coordinator
- **PwC (Intellera Consulting)**
- **EKA**
- **ETA Consulting**

Regionalizing the AIoD: DIH Catalogue AI (E)DIH (434, 126)

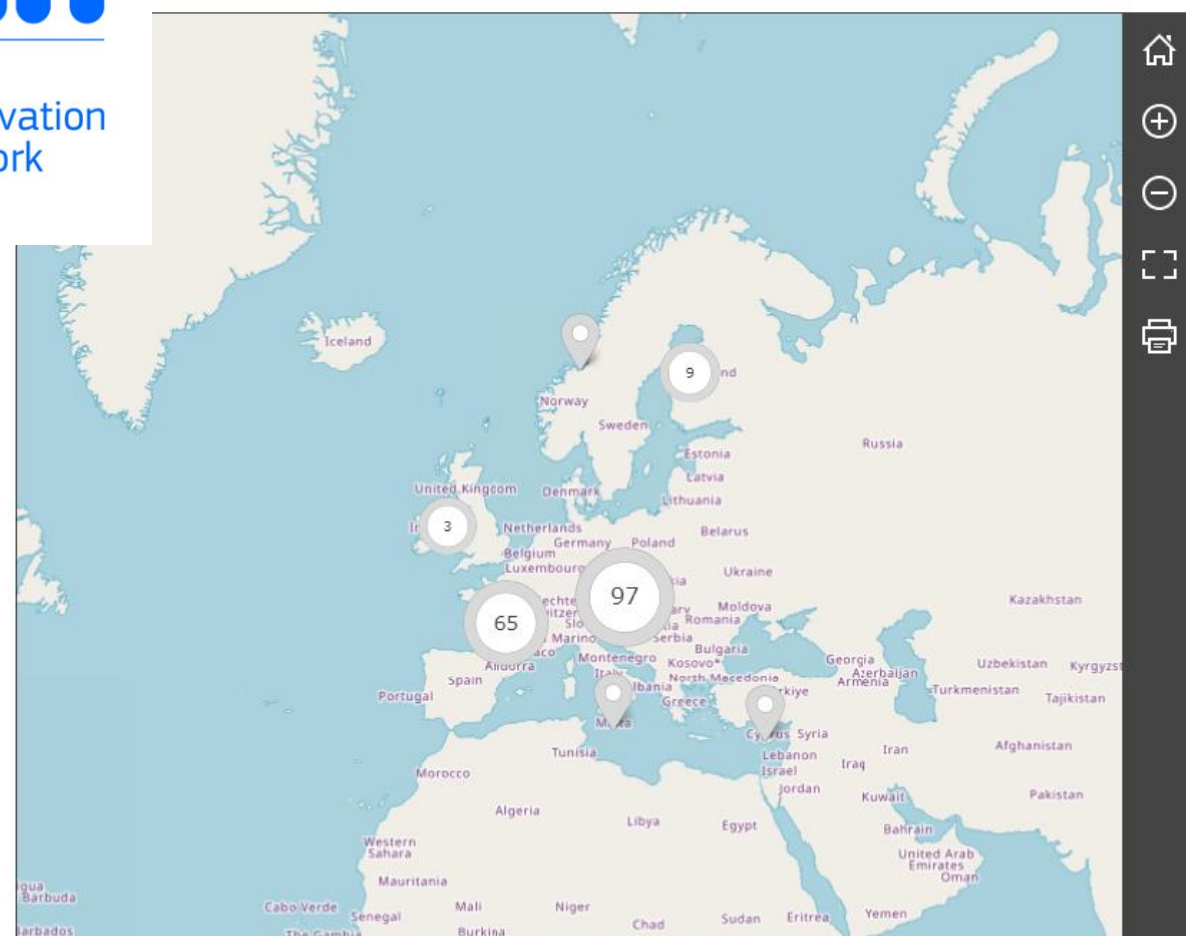
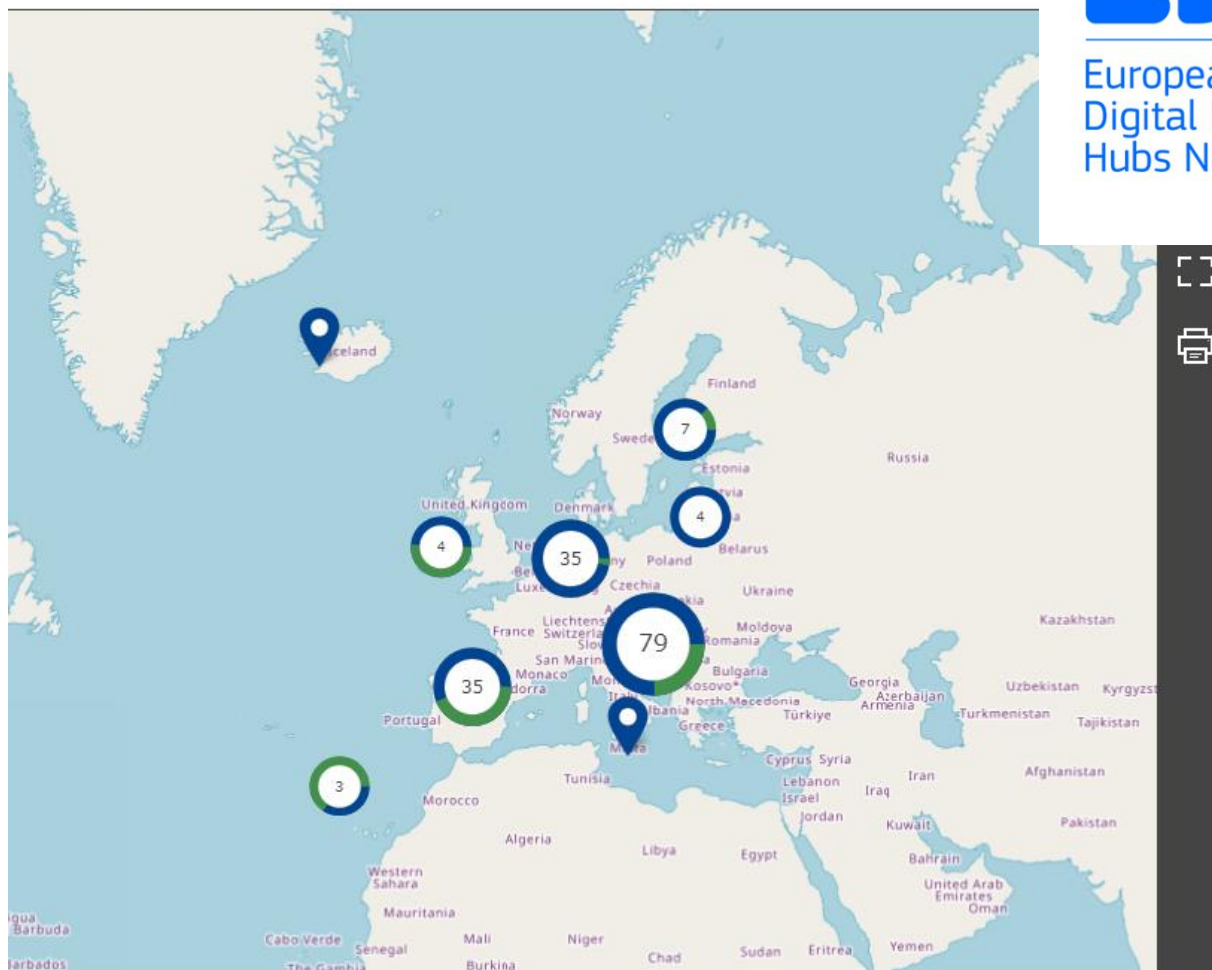
1. Be part of a **regional**, national or European policy initiative to digitise the industry;
2. Be a **non-profit** organisation;
3. Have a **physical presence** in the region and present an **updated website** clearly explaining the DIHs' services
4. Have at least **3 examples** of how the DIH has helped a company with their digital transformation



EDIH Catalogue AI EDIH (169 / 228, 100+ / 177)

EDIH

European
Digital Innovation
Hubs Network



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- Funded under Digital Europe Programme
- Seal of Excellence
- Funded by other initiatives

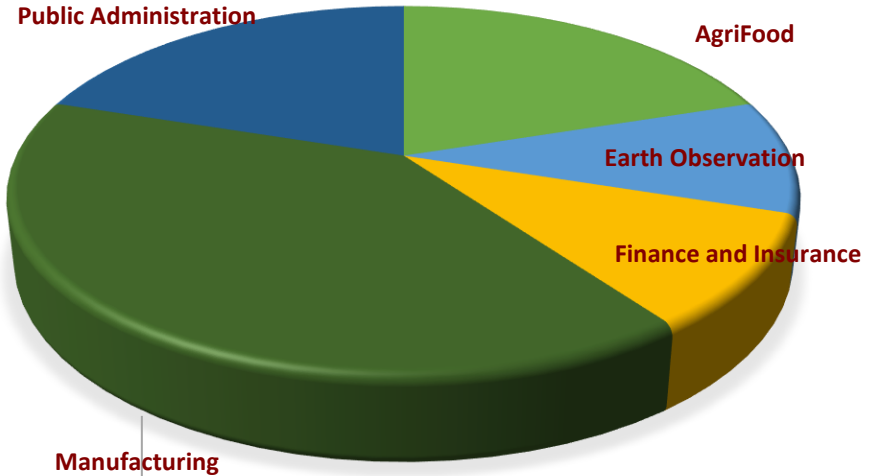
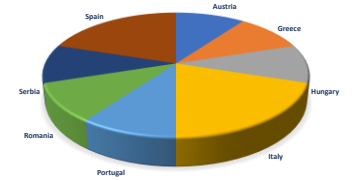
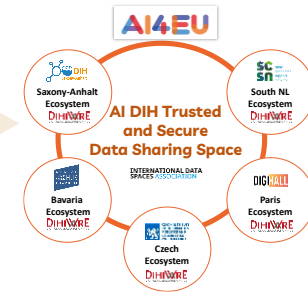
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- Funded under Digital Europe Programme
- Seal of Excellence

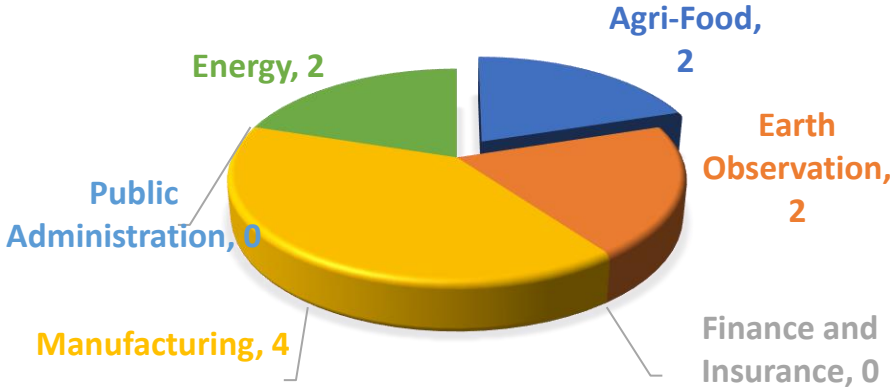
DIH4AI network of (E)DIHs specialized in AI

32 DIHs in DIH4AI Innovation Action (147 applications)

The 5 DIHs in the initial project are extended with further 13 DIHs coming from the first Open Call. In the second Open Call 14 new DIHs

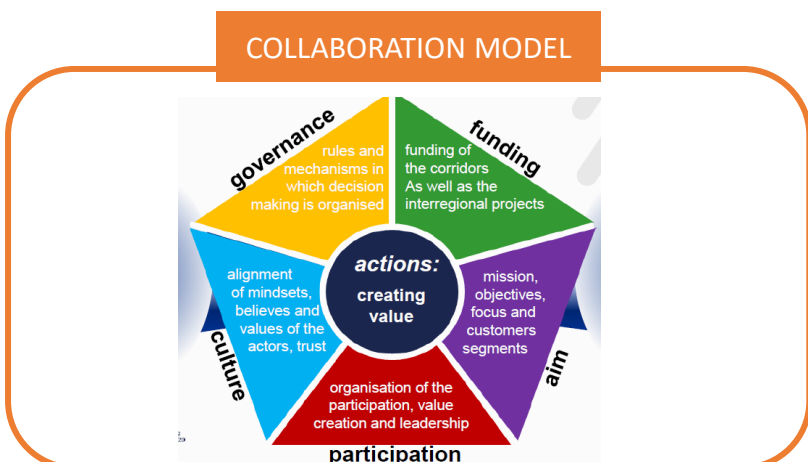
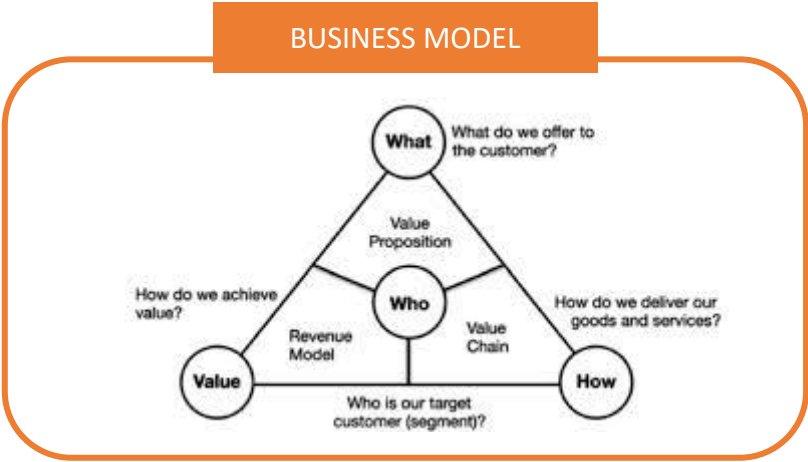
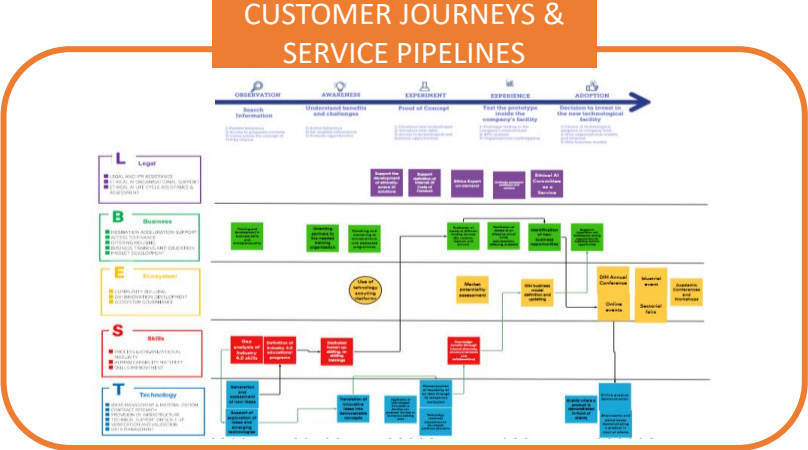
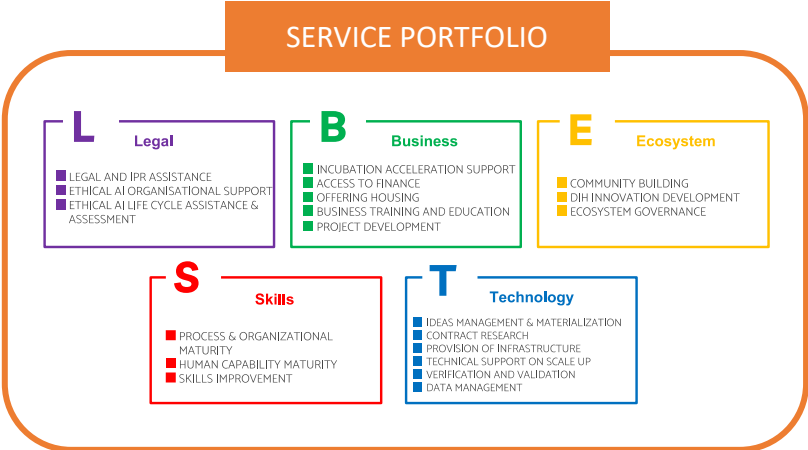


DISTRIBUTION BY VERTICAL



METHODIH – a METHOdology for DIHs

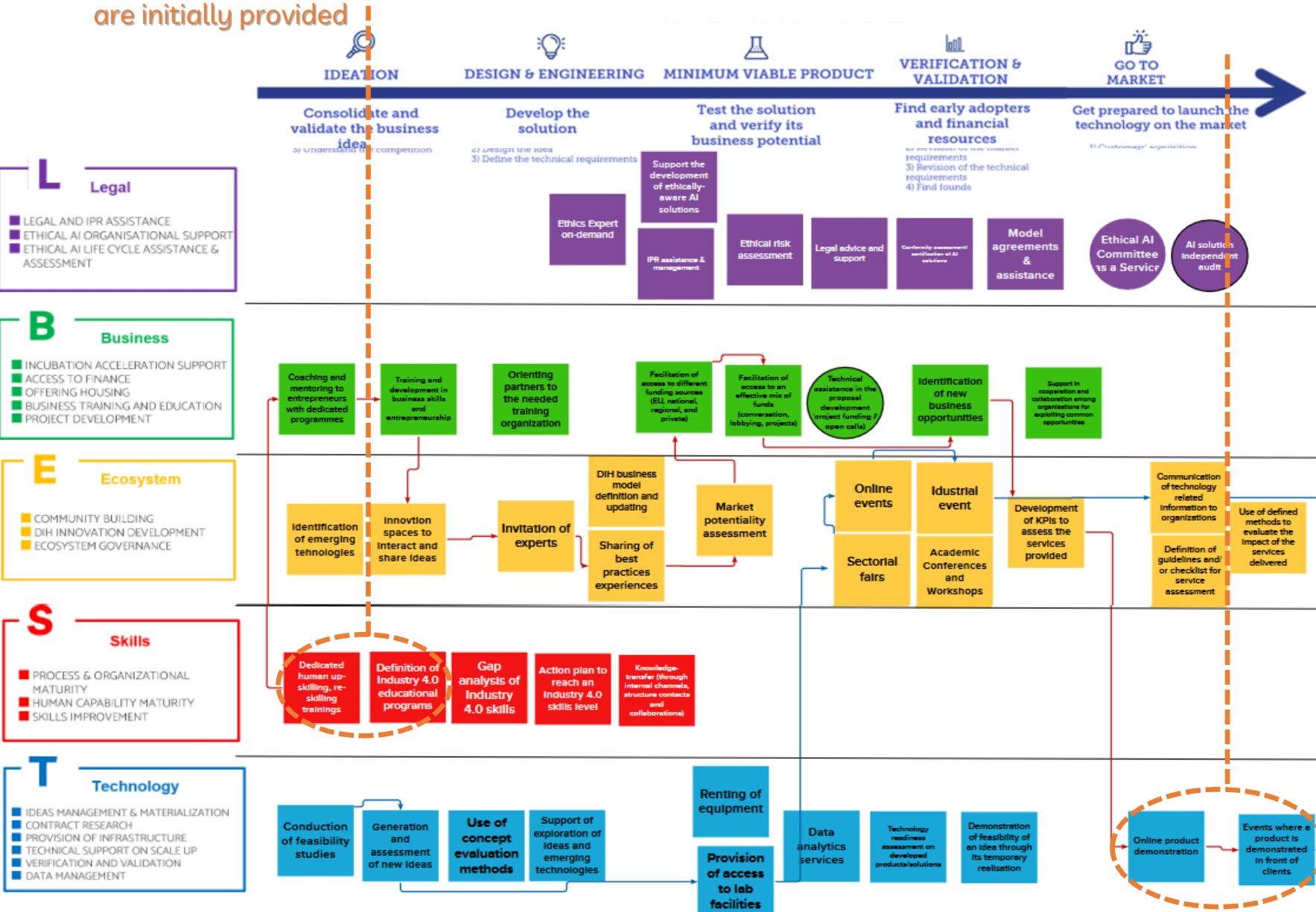
- Set of methods and frameworks defined to create **common standards** among DIHs, to support them in service exchange and provisioning



METHODIH – envisioning our Success stories

Starting point: Skills services are initially provided

- Biosense Institute, Serbia, **Agriculture sector**
- Typology of customer: **tech provider / startups**



The BioSense accelerator was officially launched by the DIH. The red line in the graph follows the services intended for tech providers. It starts from dedicated human upskilling and reskilling trainings. First a gap analysis is conducted to organise courses with mentors for every team in the accelerator program. Startups with innovative digital solutions in the field of agriculture have shown great interest in this support program. At the end of the journey Online product demonstration and Events where products are presented in front of clients will support the «go to market» step.

Desired status: e the go to market step through the programme

AIoD & DIH4AI: Regionalise & Servitise



Developed an L-BEST 3-levels taxonomy of Services

L Legal

The screenshot shows a website header with navigation links: AI Community, Business & Industry, Research, Education, Ethics, Services, News & Events. The main content area features a dark banner with the word 'Ethics' and the text 'Promoting European ethical, legal, cultural and socio-economic values for AI'.

B Business

Open Calls

Explore Open Calls to find funding and supports SMEs and more

[Explore Open Calls](#)

E Ecosystem

AI4EU Webcafés

The AI4EU Web Café provides the users with possibilities to participate virtually in live sessions with experts on specific AI domain or areas of interests.

S Skills

Education

Access to AI courses and materials for up-skilling, learning about AI and career development.

T Technology

Experiments and Sandbox

Open space for **AI developers** that offers visual and intuitive design methods. Facilitates the creation of human-centered AI-solutions, building modular structures and using hybrid AI technologies.

Discover our **resources**, **develop your own solutions**, collaborate and share your ideas and solutions with the AI community.

[Access the service now!](#)

AGENDA of the SESSION



Sergio Gusmeroli POLIMI

DIH4AI Introduction
and the L BEST
Service Portfolio
Analysis



Tomas Pariente Lobo ATOS

DIH4AI Technical
Interoperability
with the AI on
Demand Platform



Barbara Grottoli EKA

DIH4AI Portal
Interoperability
with the AI on
Demand Platform



Jaime Codagnone



Noemi Luna INTELLERA

The DIH4AI
Regional / inter-
Regional
Experiments



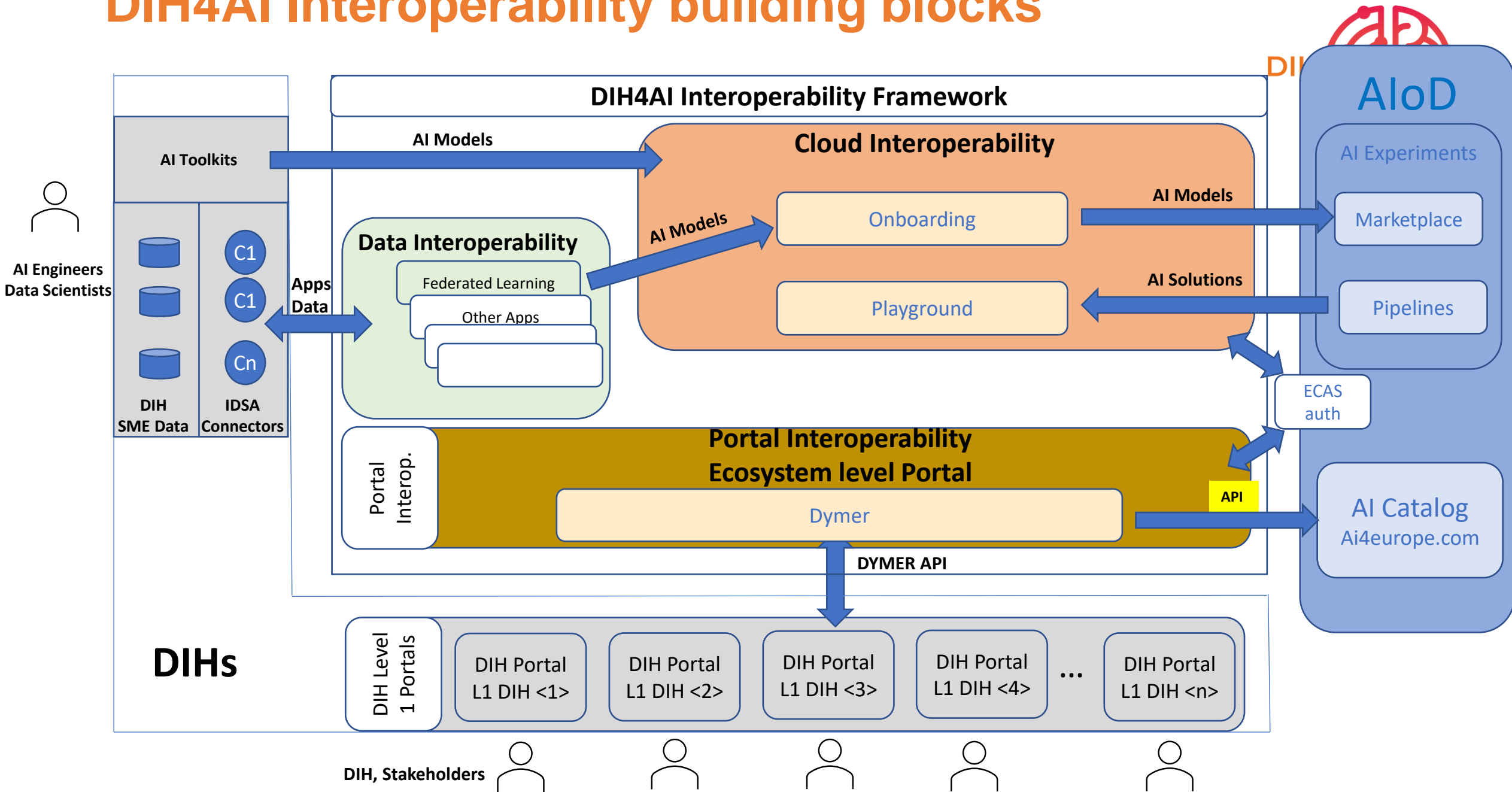
Jaime Codagnone



Noemi Luna INTELLERA

The DIH4AI FSTP
Program the two
waves of Open Calls

DIH4AI Interoperability building blocks



WP3 - Summary of main results



Portal interoperability

- Integration of the EU Login from the DIH4AI Portal and OpenID Connect
- Automatic interoperability to populate resources in the DIH4AI L2 Resource Catalog to other compatible portals (e.g., DIH4Industry)
- Manual interoperability with the AIoD AI catalog (based on similar previous data model)
- Local tests with AIoD API for automatic interoperability between the DIH4AI L2 Portal and the AIoD AI catalog

Data interoperability

- TNO TSG components OS release (Connector, Broker, DAPS) and documentation
- Released IDS-based FL framework with manual AIoD support
- Started process of external evaluation of IDS components for IDS certification
- Alignment meetings with Data Space Business Alliance (DSBA), the collaboration between the BDVA, FIWARE, Gaia-X, and IDSA
- Compliance and contributions to standards related to data spaces

Cloud interoperability

- AIoD AI Experiments compatible Playground for experimentation (onboarding, downloading solutions)
- The AIoD Solutions catalog is integrated in the TeraLab marketplace, where solutions can be executed
- Presented to the AIoD TCD in September 2023 meeting
- Running in a development environment: In Teralab cloud

Generating technical enablers for cross-DIH (Regional) and AIoD (European) collaboration

Data Interoperability



Using a Data Space to get share data and models

- IDS-based
 - Released open-source TNO TSG components (Connector, Broker, DAPS).
 - Released public easily readable documentation.
 - Released Federated Learning framework with manual AIoD support.
- Started process of external evaluation of IDS components for IDS certification.
- Alignment meetings with Data Space Business Alliance (DSBA), the collaboration between the BDVA, Fiware, Gaia-X, and IDSA.
 - <https://gitlab.com/tno-tsg/>
 - <https://tno-tsg.gitlab.io/>
 - <https://gitlab.com/tno-tsg/data-apps/federated-learning>
 - <https://www.ai4europe.eu/research/ai-catalog/platform-service-accountable-evidential-transactions>
 - <https://aiexp.ai4europe.eu/index.html#/marketSolutions?solutionId=a90b4145-51ec-4345-be5f-21d2c8e9a214&revisionId=c4624a34-affb-417b-b004-d30809697b49&parentUrl=marketplace#md-model-detail-template>



AI Experiments-compatible Playground



IMT – Teralab: last features



The AIoD Solutions catalog is integrated to in the Teralab marketplace, where solutions can be executed

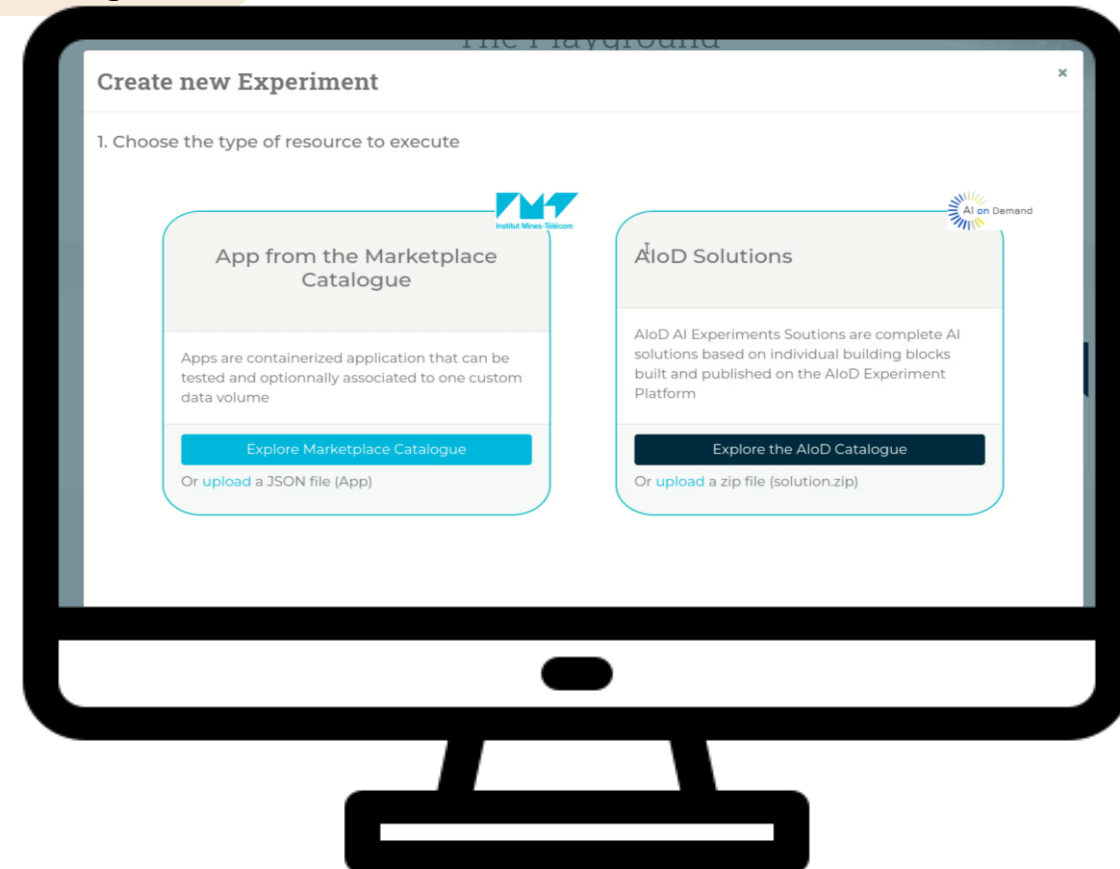
Pushing executable resources from the Teralab catalog to the AIoD catalog

Playground Current environment



Running in a development environment

In Teralab cloud



Onboarding resources to AI Experiments



your selection down.

Contribute a new resource to the catalog
First time in the catalog ? Read the [doc](#)

Add Resource

Enter search terms here... Search

Filters

Sort by: Name Creation Date Update Date

By resource type

- Notebook 1
- Docker Container 5
- AI Model 2
- Executable 1
- Library 0
- As A Service 0

Test2
introduction to my new app.
View
★★★★★
notebook

my-project-notebook
The results of my datascience study.
View
★★★★★
ai_model

JupyterLab Test App
The results of my datascience study.
View
★★★★★
docker

SSH Test App
introduction to my new app.
View
★★★★★
docker

Test2
The results of my datascience study.
View
★★★★★
executable

Onboarding of a resource located in Teralab Marketplace to AI Experiments



From the Teralab Marketplace Catalog, we select docker containers to onboard

Onboarding resources to AI Experiments



The screenshot shows a web browser window with the URL `ws37.tl.teralab-datascience.fr:31281/resources/6501ac247f416e301f1db182`. The page displays the details for a resource named "MNIST model gRPC container" published by Souleymane KANTE. The "Onboard" button is highlighted, and a modal window titled "Onboard on AI Experiments" is open. The modal contains the following information:

Resource Name	MNIST-model ✓
Auth Tokens	apiKey
Container url	docker.io/skante/dih4ai-mnist-model:1 ✓
Protobuf file	model.proto (417 B) ✓
Licence file	license-1.0.0.json (570 B) ✓

Below the modal, there is a section for "Last Onboarding status" with the following details:

- Last onboarding update: 9/13/2023
- Onboarding result:

Overlaid on the screenshot is the text: "The model is in a Docker container we send it to AI Experiments".



The container is prepared (Protobuf, gRPC...). We proceed with the onboarding.

Onboarding resources to AI Experiments



A screenshot of a web browser displaying the 'AI Experiments' interface. The page is titled 'My Models' and shows a list of unpublished models. The models listed are 'MNIST-broker', 'MNIST-model', 'MNIST', and 'GRPC Hello World'. The 'MNIST' model is marked as 'Pending for approval'. The interface includes a search bar, filter options, and a sidebar with navigation links like 'HOME', 'MARKETPLACE', 'MY MODELS', 'ON-BOARDING MODEL', 'DESIGN STUDIO', 'Q AND A', and 'ML LEARNING PATH'. A text overlay at the bottom of the screenshot reads 'The database is now in AI Exp.'.



The model (in this case a model and a DB) is now in the AI Experiments ready to be used.

Onboarding resources to AI Experiments

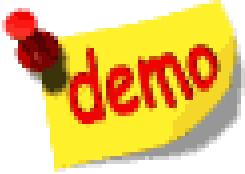


The screenshot displays the 'Design Studio' interface for AI Experiments. The main workspace shows a pipeline with two nodes: 'MNIST-model1' and 'MNIST-broker1'. The left sidebar contains a 'Marketplace' with categories like Classification, Prediction, and Regression, listing various models and tools. The right sidebar shows the 'Properties' of the selected 'MNIST-broker1' model, including its name, type, author, and provider.

In AI Experiments, now we can create a pipeline and package it as a solution



And now we can test the solution in the playground



Downloading the solution to our Playground Kubernetes cluster and executing it



AIoD Contributions



- IMT Playground
- TNO data space resources, FL, examples in AI Experiments
- DIH4AI Portal resource catalog. Compatibility with resources from DIHs to be shared at EU level in the AIoD portal

DIH4AI Portal Interoperability with the AI on Demand Platform



Barbara Grotoli EKA



Success stories of DIHs collaboration across EU



Noemi Luna Carmeno, Intellera Consulting

Jaime Alessandro Codagnone, Intellera Consulting



How can DIHs collaboration happen?



Collaboration with other DIHs offers the possibility to **upgrade** their respective technological capacities, service offerings and in-house skills. It can happen in different ways.

Thanks to **structured collaboration**, Hubs can respond more effectively to specific client needs and provide better services. For example, through the:

1. Partnership to provide service

- DIHs can **deliver services in cooperation with other partners** with complementing competences

2. Development of a new service

- DIHs can enlarge their offering by leveraging on the **skills and capabilities available** within the **network**

3. Matchmaking

- DIH supports clients in **identifying potential partners** in another ecosystem (e.g. technological, business or financial partners)



DIH4AI cross-regional collaborative experiments



L B E S T	1. Partnership to provide service jointly	2. Development of a new service	3. Matchmaking
Business		AI Business Plan Assessment Lead: CTU/CIIRC Partners: Fraunhofer IFF, TNO X-PRAG-3	
Ecosystem	Pan-EU AI Adopters Ecosystem Lead: DIGIHALL Partner: fortiss, Fraunhofer X-PAR-1	Catalog of experiments at crossDIH level Lead: CIIRC/CTU Partners: TNO, DIGIHALL X-PRAG-2	AI EU Consortia Lead: DIGIHALL Partner: Fraunhofer IFF X-PAR-2
			AI Awareness Raising Skills for DIH Lead: Fraunhofer IFF Partner: TNO, fortiss X-SAX-1
Skills	AI DIH Winter School Lead: CTU/CIIRC Partners: fortiss, Fraunhofer X-PRAG-1	Quick Check –Maturity Assessments Lead: fortiss Partner: DIGIHALL, CIIRC/CTU, Fraunhofer X-MUC-1	
Technology	AI Testing and Experimental Facility in Manufacturing Lead: TNO Partner: CIIRC/CTU, fortiss X-NL-2	Platform-as-a service for accountable evidential transactions Lead: fortiss Partner: TNO X-MUC-2	



A Success Story for cross-DIH Collaboration: AI awareness raising skills for DIHs



The experiment brought together **three DIHs** to develop and deliver **AI awareness raising skills** by exploring the challenges and opportunities of **building a cross-regional demonstrator**

Outcomes and lessons learned

- Agreeance into the development of a **collaboration plan** for the **joint demonstrator**
- Onsite collaboration allowed to outline the **specialisms of the DIHs, identifying synergies**, and taking concrete steps towards a joint demonstrator
- Highlighted the value of **cross-DIH collaboration in AI awareness raising** and capacity building for SMEs, and the potential of smart industries in **smart connected value networks**.



A Success Story for cross-DIH Collaboration: Platform-as-a-service for accountable evidential transactions



PIANAI platform provides technical means for the definition of **verifiable claims** regarding the **design, deployment and consumption** of a **trustworthy AI service** using federated learning techniques

From a local to a collaborative

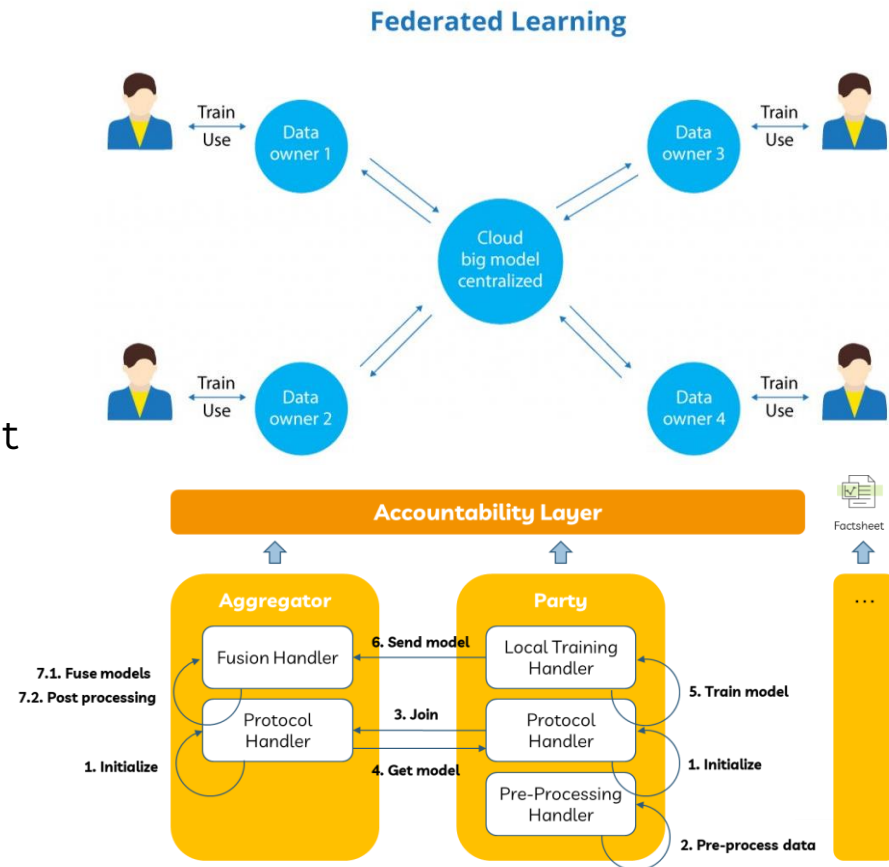


Intra DIH experiment - development and testing of the platform on 4 Use Cases:

- **Aerospace** - platform for the decentralized management of drones
- **Manufacturing** - decentralized dataspace and smart services for knowledge engineering
- **Public Administration** – digital personal assistant for online public services in German PA
- **Retail** – verifiable product information



Cross DIH experiment - alignment with the TNO AI Manufacturing Testbed in regard to International Data Spaces (IDS), GAIA-X and federated learning and integration



Lessons Learned from cross-DIH collaboration



Thanks to DIH4AI-enabled cross-DIH collaborative experiments, we were able to gather useful insights for future DIHs collaborations:



Key tools for successful collaboration

- Inspirational **collaboration scenarios**, examples and lessons learned
- Online recurring meetings and ad hoc **physical meetings**
- Knowledge exchanges and **shared workspaces**



Challenges & lesson learnt

- **Difficulties in engaging SMEs**
 - Clear value proposals to SMEs and success stories
 - Awareness raising on DIHs and AloD platform value offering for SMEs
- **Misalignments**
 - Meet in person and adopt flexible teams to overcome misalignments and increase contamination
- **Language barrier**
 - Engage local communities and promote local events in national languages





DIH4AI Open Calls



Noemi Luna Carmeno, Intellera Consulting

Jaime Alessandro Codagnone, Intellera Consulting








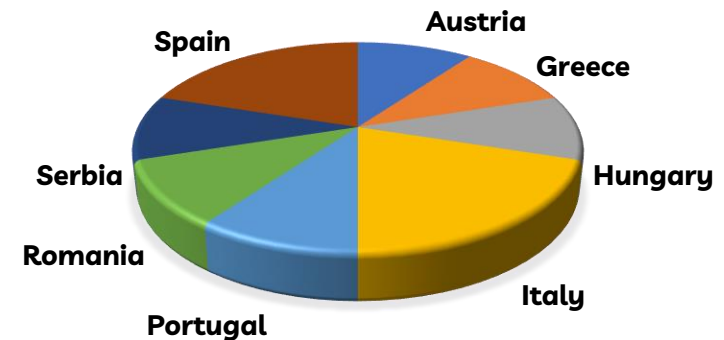
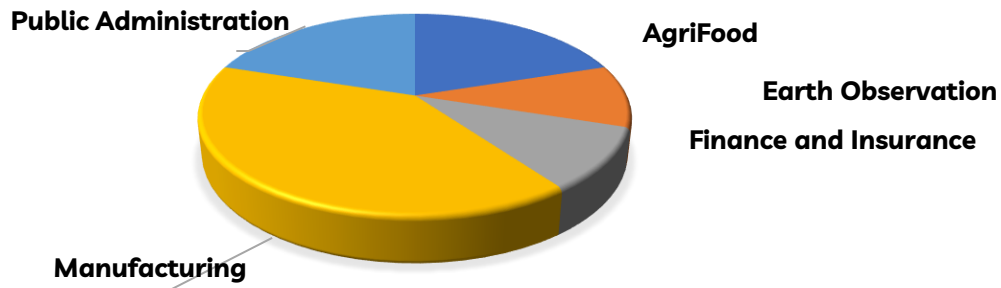
First Open Call Results

Expanding DIH Network















- 80 Proposals: 73 type A; 7 type B
- 20 Countries

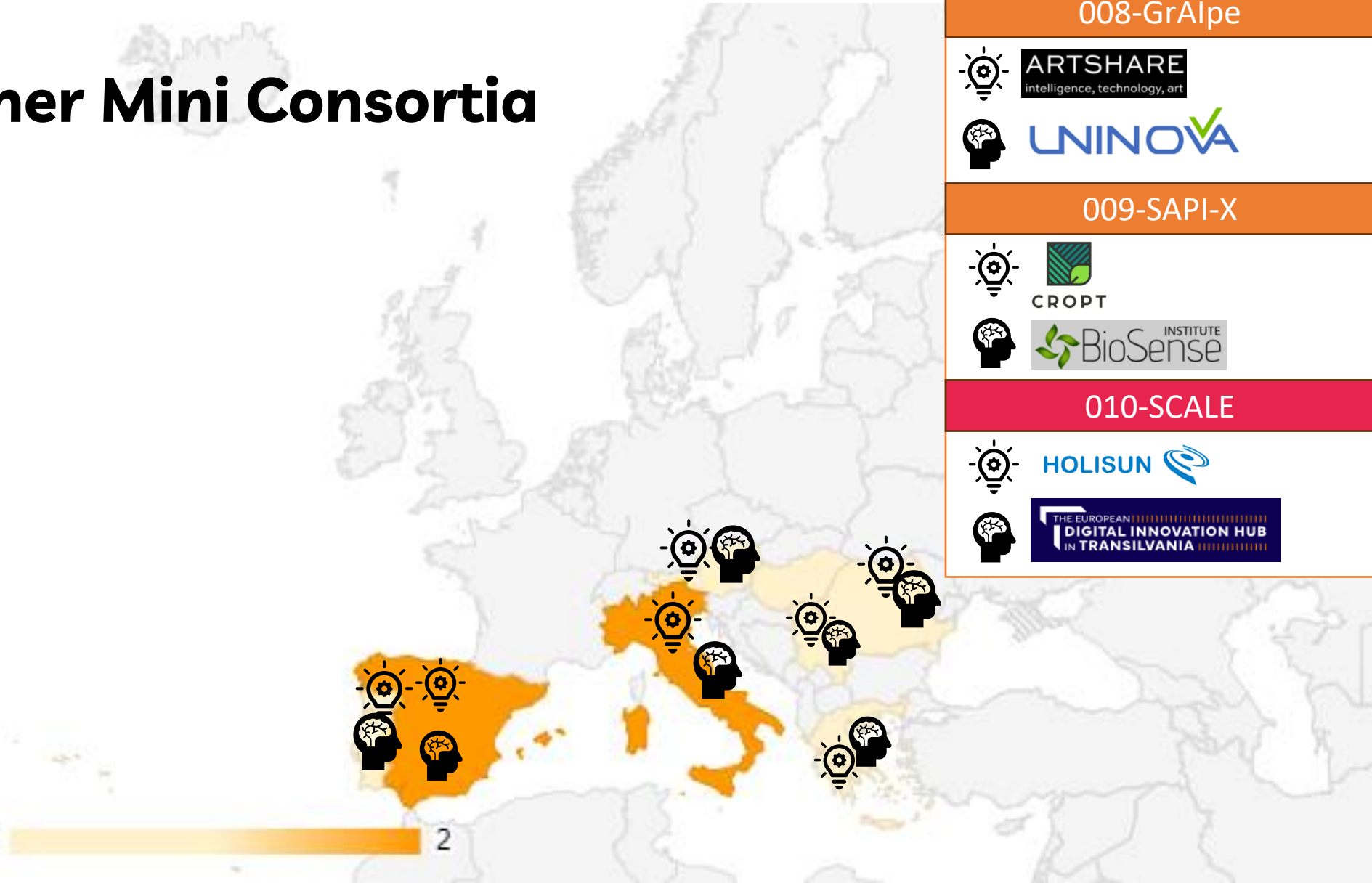
5 Areas













	Agrifood	13
	Earth Observation	11
	Finance and Insurance	11
	Manufacturing	33
	Public Administration	12



Type A Winner Mini Consortia

004-AUTOMAINT	
	
	 Τμήμα Ηλεκτρολόγων Μηχανικών & Μηχανικών Υπολογιστών ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΛΟΠΟΝΝΗΣΟΥ
005-CAVA4FITS	
	
	
006-ControlEye	
	
	
007-EO4NOWCAST	
	 MASTERING EXCELLENCE
	



008-GrAlpe	
	 intelligence, technology, art
	
009-SAPI-X	
	 CROPT
	
010-SCALE	
	
	

 Leader SME
  DIH
  DIH 4 AI

Type B Winner Mini Consortia

001-AI4CLEARANCE



USYNCRØ
Where you synchronize global trade



002-AI4OPTIMAPS



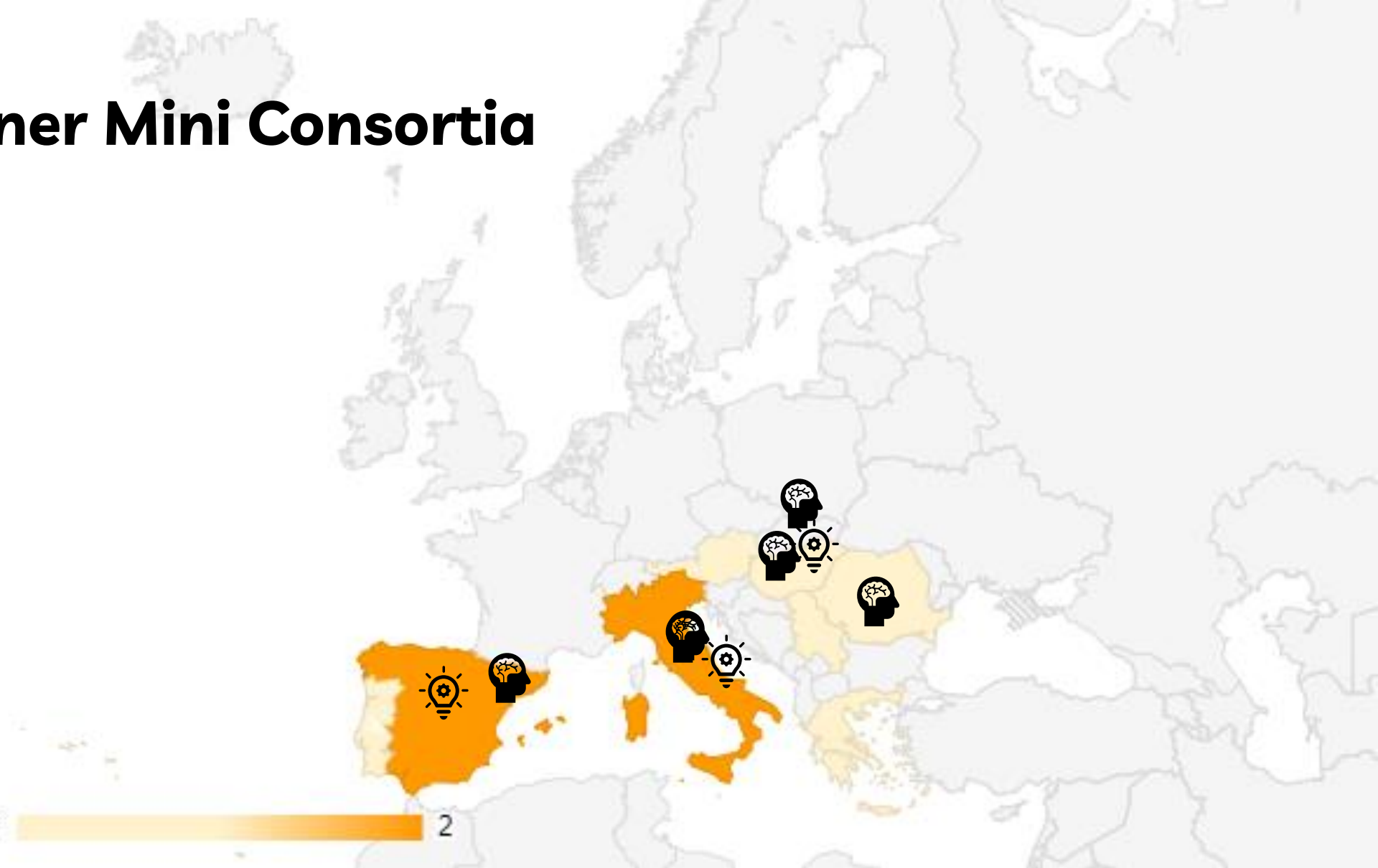
DSS
CONSULTING



003-DIH:Okai



R4P



Leader SME



DIH



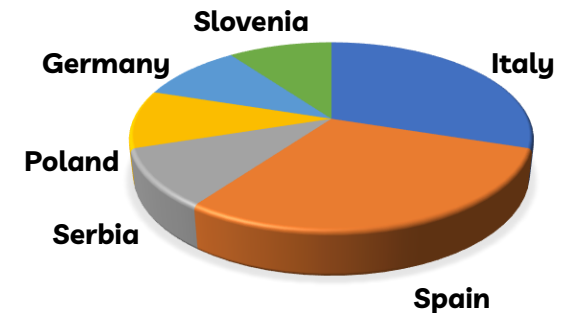
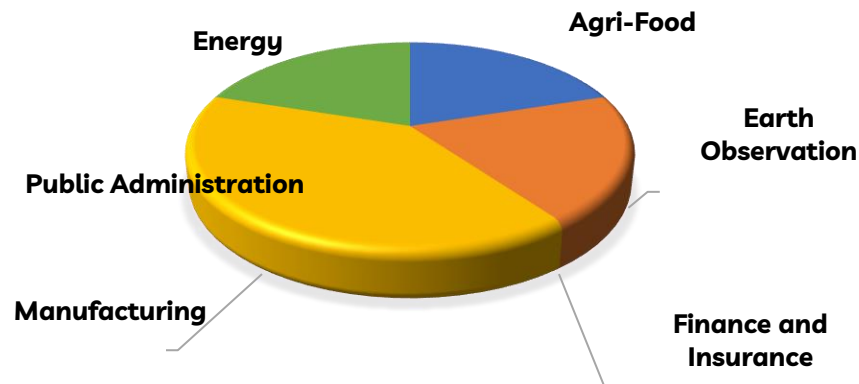
Second Open Call Results

Expanding DIH Network

- 67 Proposals: 59 type A; 8 type B
- 19 Countries

5 Areas

	Agrifood	18
	Earth Observation	8
	Finance & Insurance	6
	Manufacturing	4
	Public Admin	22
	Energy	9



Type A Winner Mini Consortia

005 – COG4SOL



006 - PREDICAI



007 – AIM2ASSIST



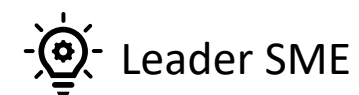
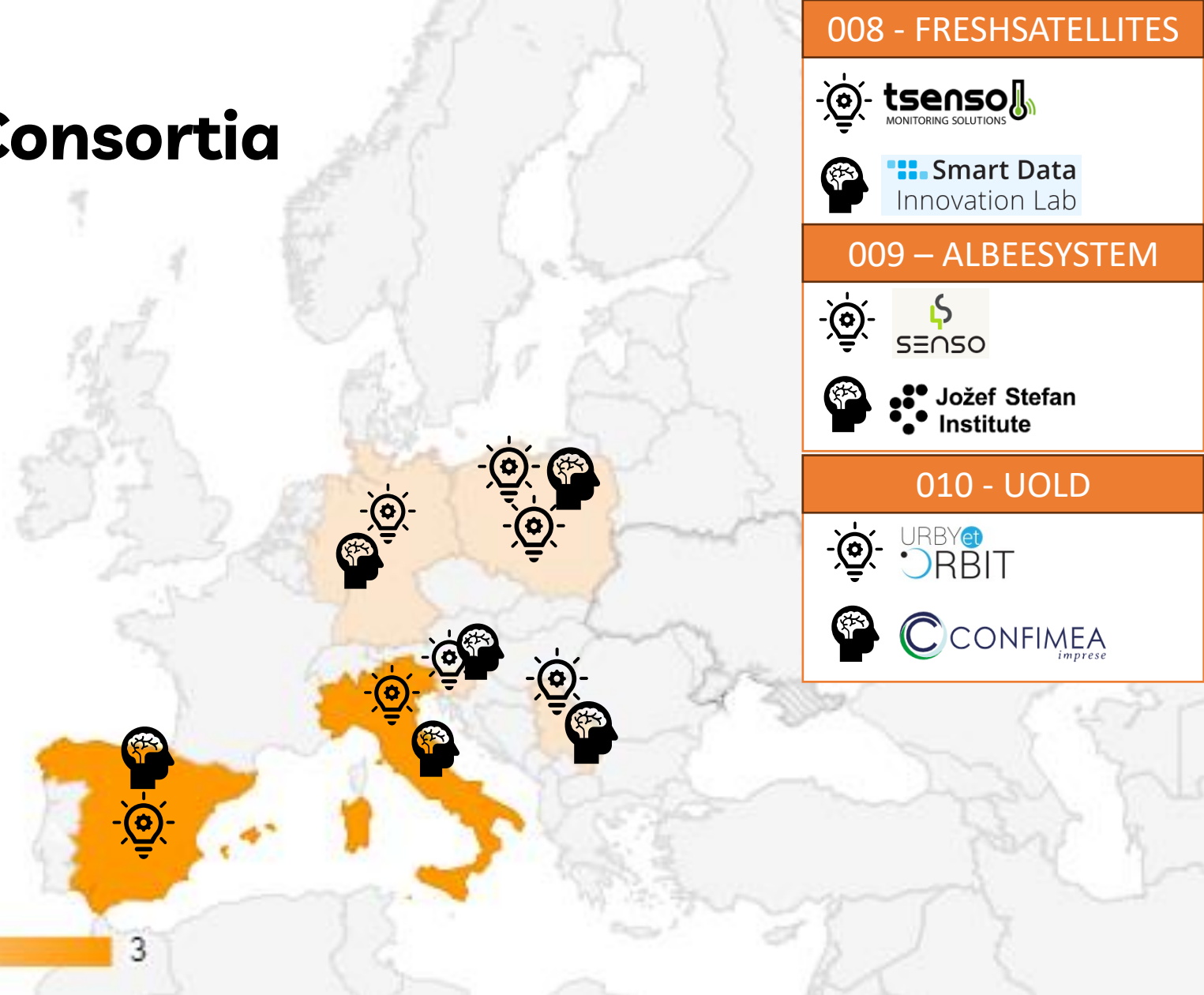
008 - FRESHSATELLITES



009 – ALBEESYSTEM








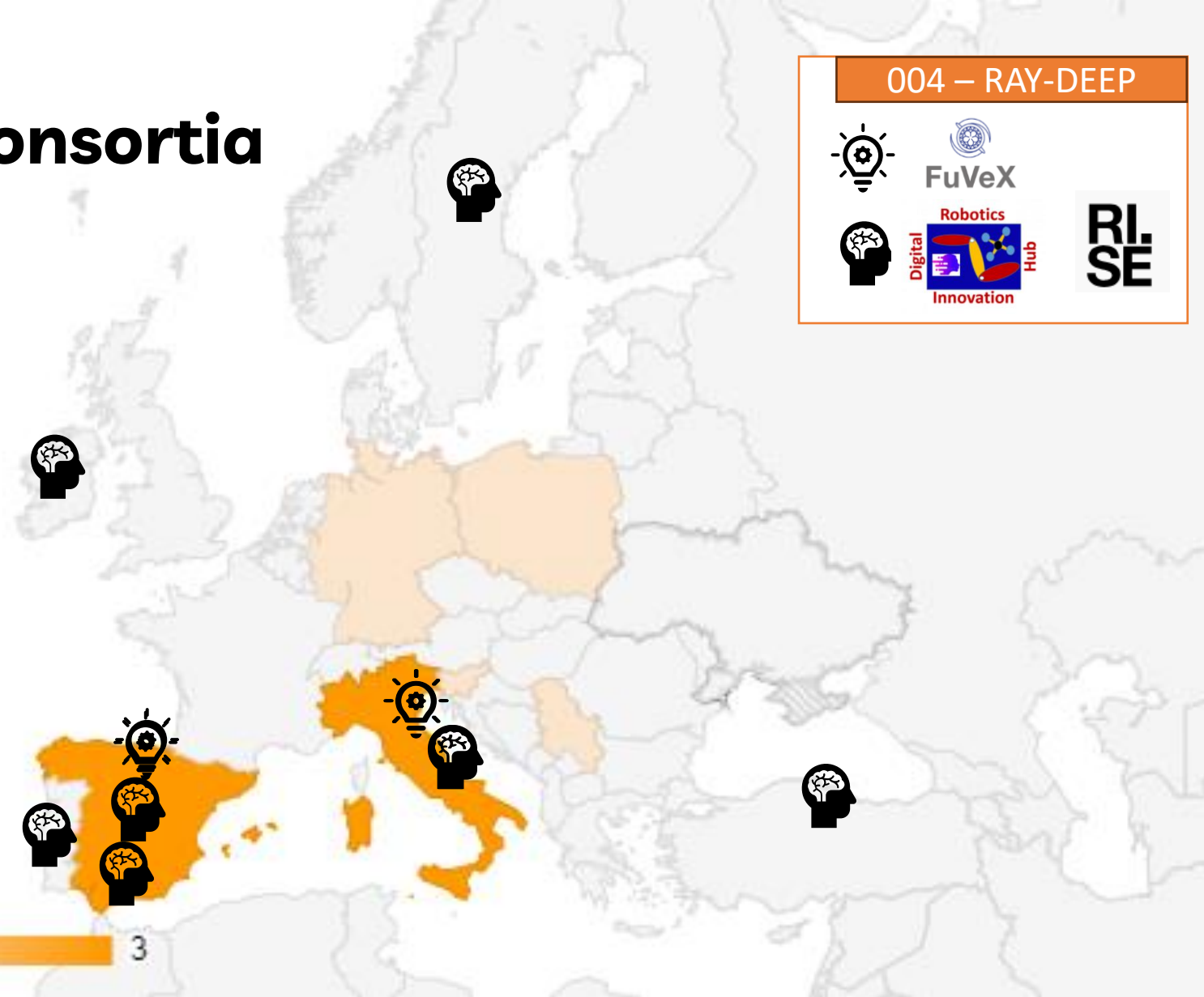
010 - UOLD



Type B Winner Mini Consortia

 		001 - FABCOD
		
002 – DIH4TAKING		
		
		
		
003 – RAY-DEEP		
		
		

004 – RAY-DEEP		
		
		



THANKS

Follow DIH4AI project updates

www.dih4ai.eu/

