AI on-demand platform for regional interoperable DIHs Network

Overview and interoperability layers

https://www.dih4ai.eu/

Tomás Pariente (Atos)

AI4EU TGB meeting

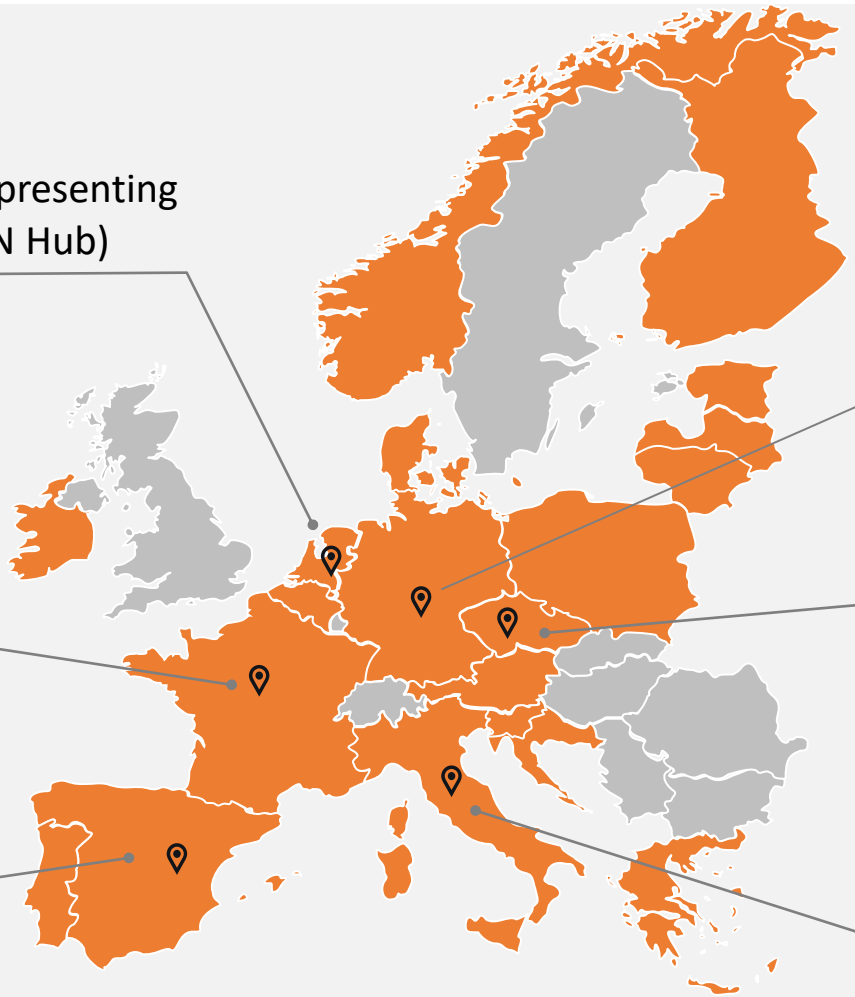
04/03/2022

H2020 Innovation Action - This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 101017057

The Consortium

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

- Regional specialization
- Methodological
- AI tech providers



TNO (representing the SCSN 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**

The DIH4AI Innovation Action

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

COORDINATOR: Politecnico di Milano

FUNDING: € 4,999,863 (2M Open Calls)

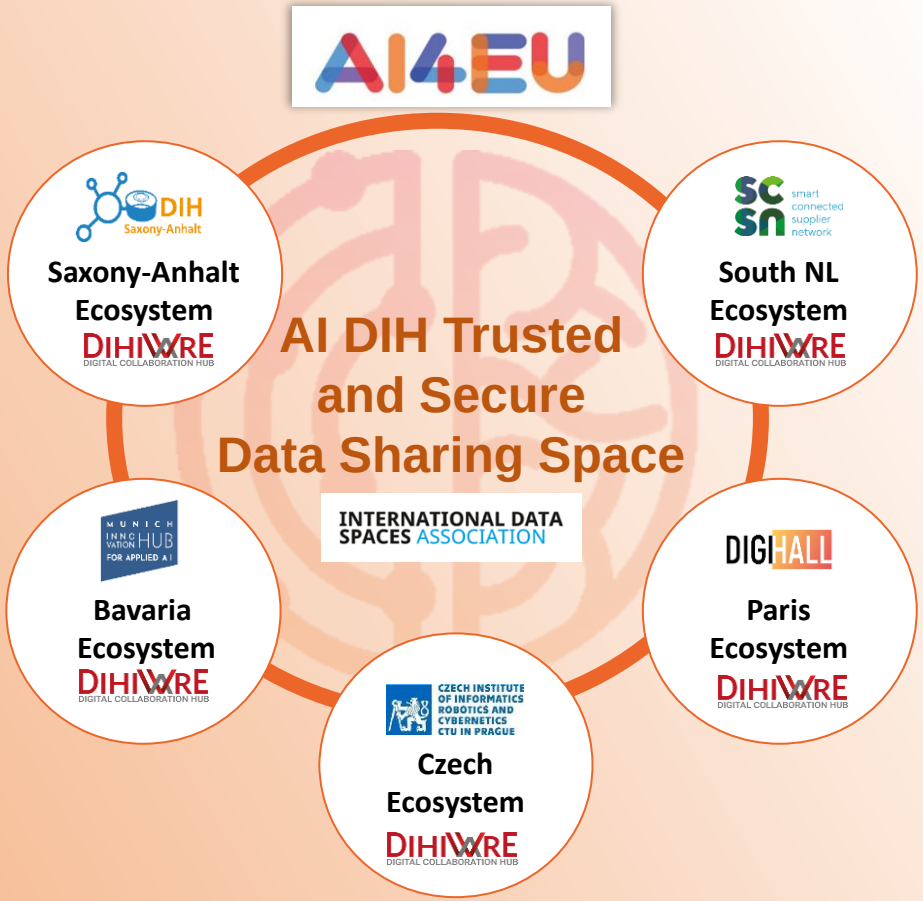
CONSORTIUM: 12 Partners from 6 countries

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/



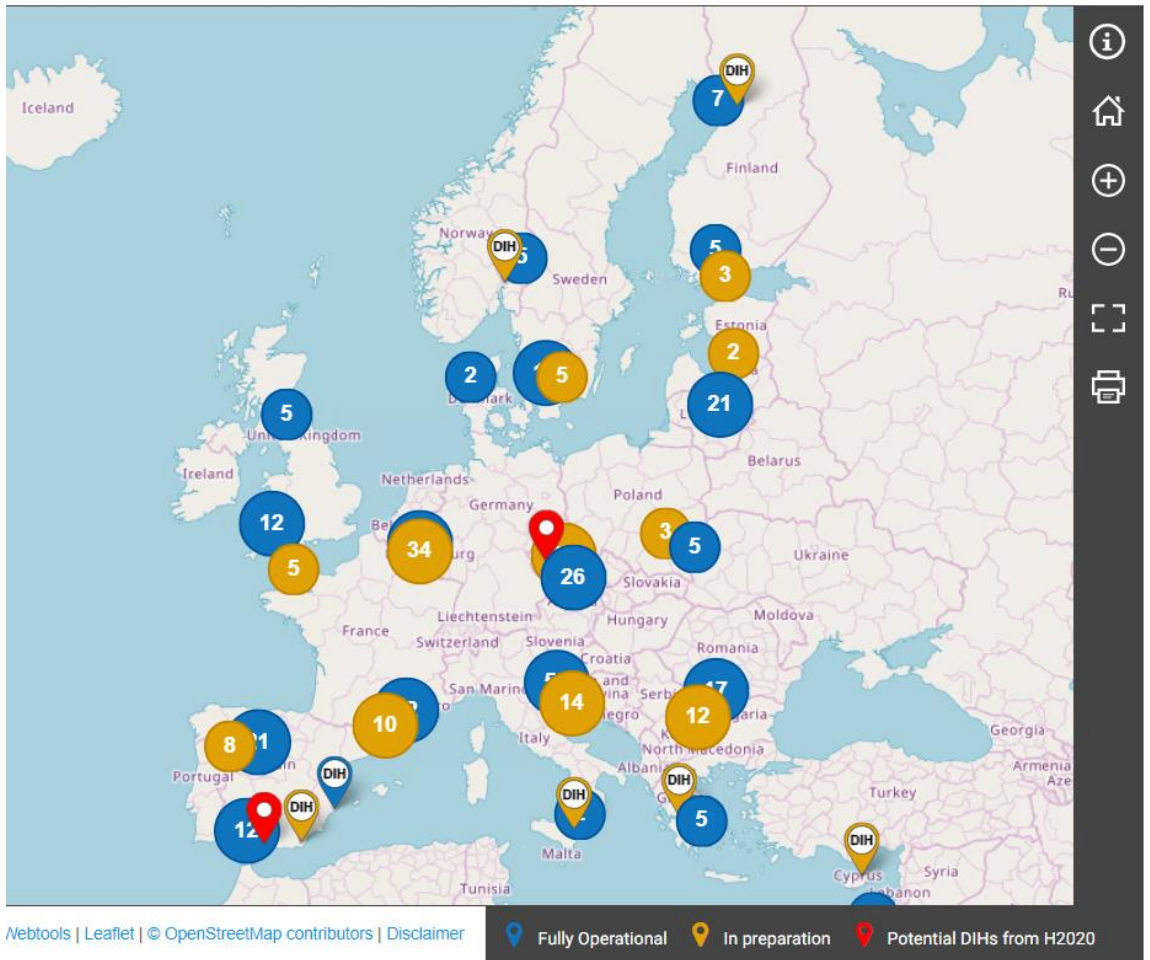
How to exploit Regional Services in the AIoD Platform

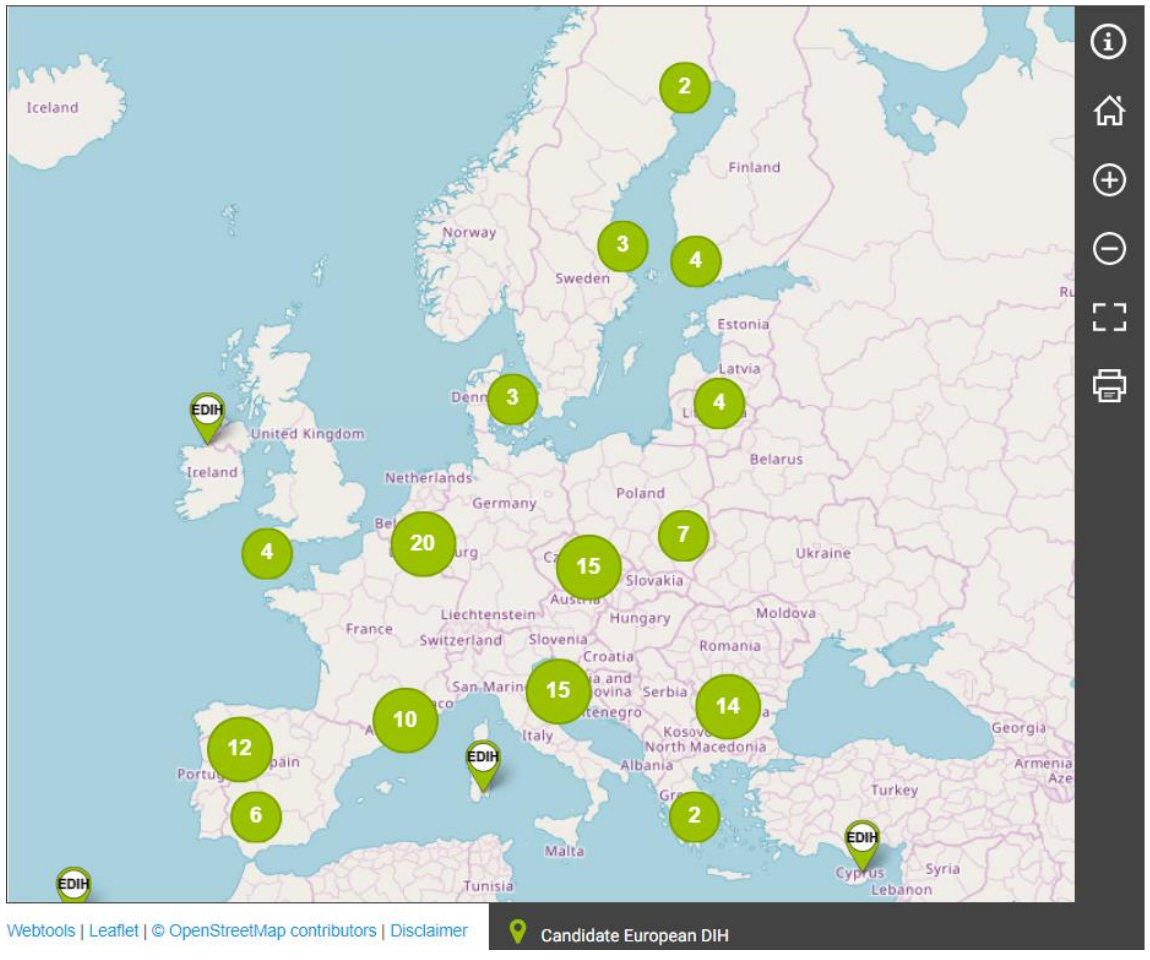
How to structure DIH Service Offer / Demand for SMEs

Definition of the key characteristics of an AI DIH, service offering, competences, business model, customer Journeys…

The JRC Catalogue and the 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





L BEST SERVICE PORTFOLIO

Developed an L-BEST 3-levels taxonomy of Services

L Legal

- LEGAL AND IPR ASSISTANCE
- ETHICAL AI ORGANISATIONAL SUPPORT
- ETHICAL AI LIFE CYCLE ASSISTANCE & ASSESSMENT

B Business

- INCUBATION ACCELERATION SUPPORT
- ACCESS TO FINANCE
- OFFERING HOUSING
- BUSINESS TRAINING AND EDUCATION
- PROJECT DEVELOPMENT

E Ecosystem

- COMMUNITY BUILDING
- DIH INNOVATION DEVELOPMENT
- ECOSYSTEM GOVERNANCE

S Skills

- PROCESS & ORGANIZATIONAL MATURITY
- HUMAN CAPABILITY MATURITY
- SKILLS IMPROVEMENT

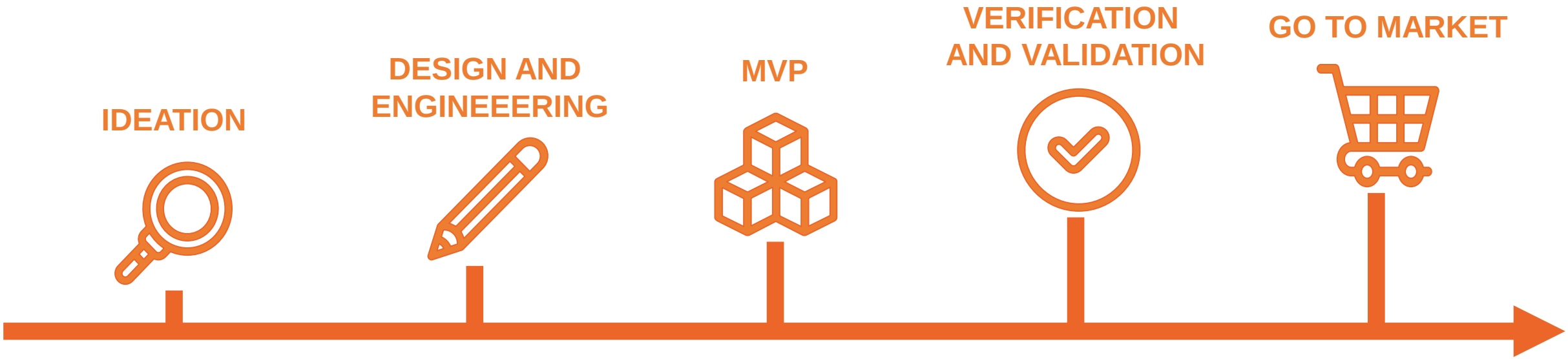
T Technology

- IDEAS MANAGEMENT AND MATERIALIZATION
- CONTRACT RESEARCH
- PROVISION OF INFRASTRUCTURE
- TECHNICAL SUPPORT ON SCALE UP
- VERIFICATION AND VALIDATION
- DATA MANAGEMENT

CUSTOMER JOURNEY – TECHNOLOGY USER

Search Information	Understand benefits and challenges	Proof of Concept	Test the prototype inside company's facility	Decision of invest in the new technological facility
• Passive behaviour • Access to proposed contents • Come across the concept of I4.0 by chance	• Active behaviour • Set targeted information • Evaluate opportunities	• Introduce new technologies • Introduce new skills • Access to technological and business opportunities	• Prototype testing in the company's environment • KPIs analysis • Organizational roadmapping	• Choice of technological adoption at company level • New organizational models and schemas • New business models

CUSTOMER JOURNEY – TECHNOLOGY PROVIDER



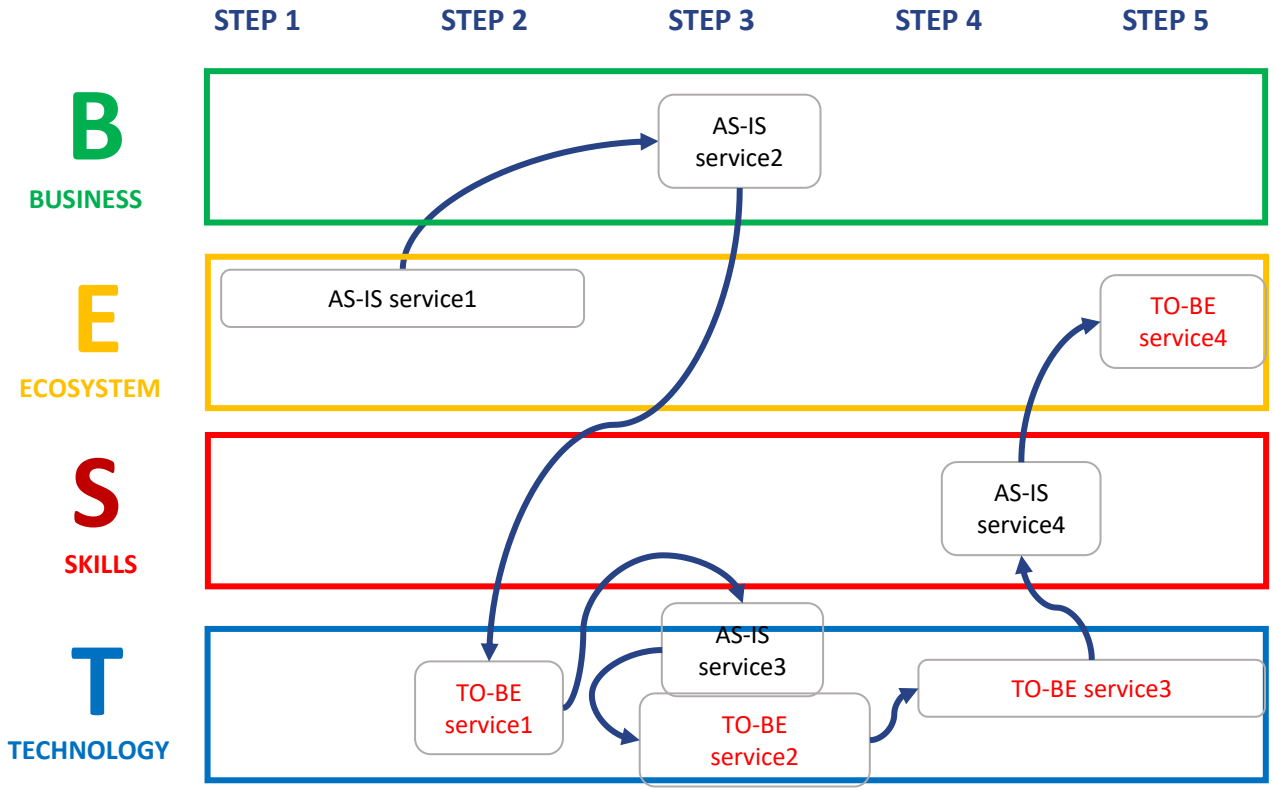
Consolidate and validate the business idea	Develop the solution	Test the solution and verify its business potential	Find early adopters and financial resources	Get prepared to launch the technology on the market
• Identify a need on the market • Sketch the idea • Understand the competition	• Understand requirements from the market • Define the idea • Define the technical requirements	• Develop the prototype • Customers' discovery	• Validation of the technological solution • Revision of the market requirements • Revision of the technical requirements • Find funds	• Customers' acquisition • Marketing • Find distribution channel • Manage legal issues

CUSTOMER JOURNEYS PIPELINE

It is the graphical representation of a Customer Journey associated to a specific Customer profile

- Not all customers of that typology behave in the same way
- Identify the different profiles and consider services involved
- Link services with arrows in order to create a digital transformation journey

TO-BE services are aimed to fill gaps in the pathway and to overcome blocking points limitations

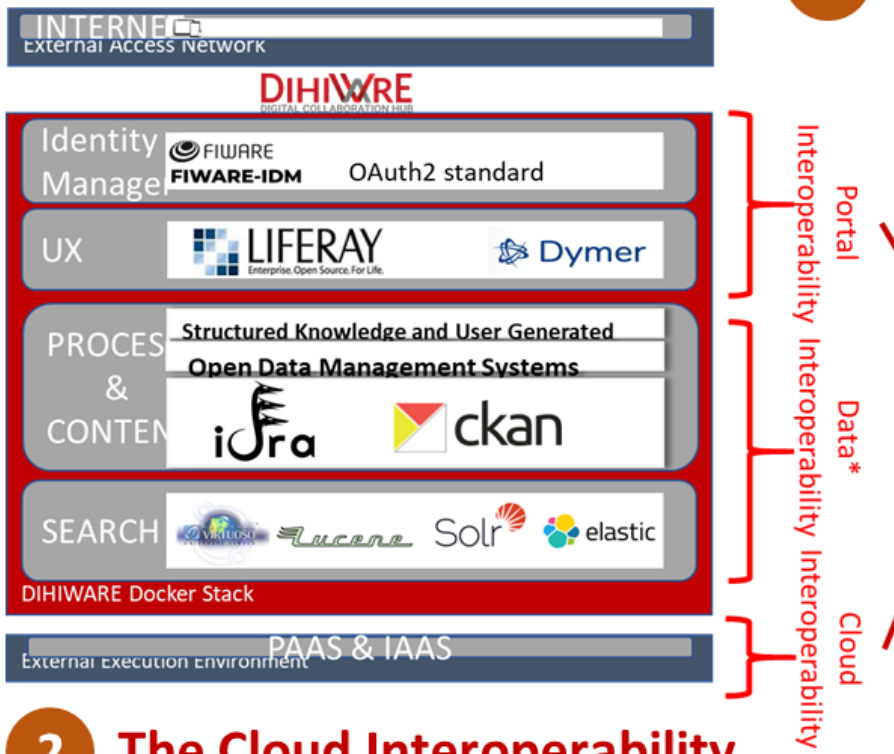


Interoperability with the AIoD (Portal, Data, Cloud)

The AIoD Platform and DIH-Europe Interoperability

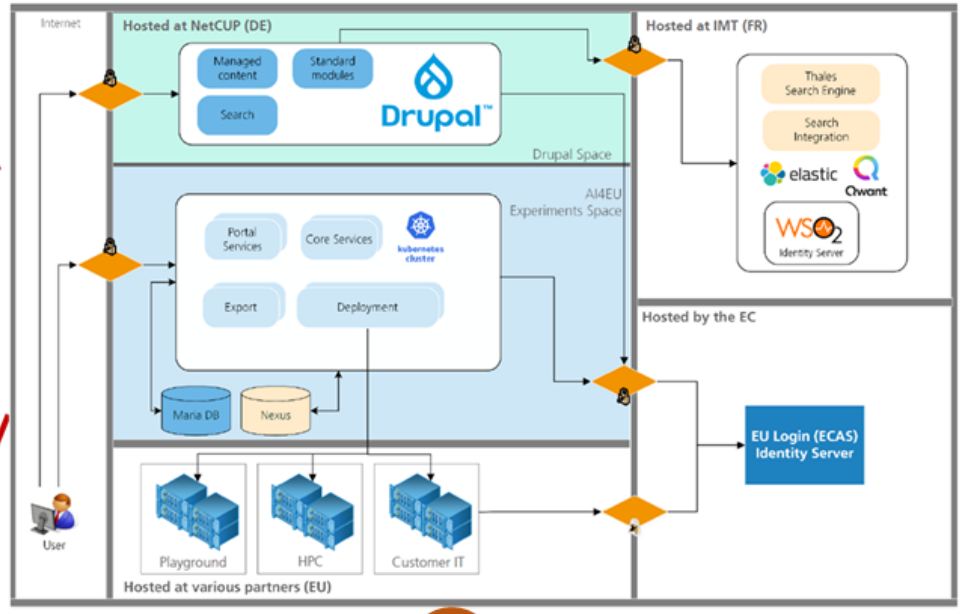
Regional DIH platforms (DIHIWARE) as IDS Network nodes with AIoD Catalog / Marketplace / Experiments Platform (portal data cloud).

DIH4AI Portal, Data & Cloud Interoperability with AIoD



1 The Portal Interoperability

To integrate **Users** and **search content** of both the Regional and the European platforms.



- DIH content page
- Cross Search
- SSO?
- Data Space
- Experiments

2 The Cloud Interoperability

To integrate **Services and AI Infrastructures** of both the Regional and the European platforms.

INTERNATIONAL DATA SPACES ASSOCIATION

3 The Data Interoperability

To integrate **Data Repositories** of both the Regional and the European platforms

Portal, Data & Cloud Interoperability with AIoD

Portal

GUI for the DIHs to the AIoD

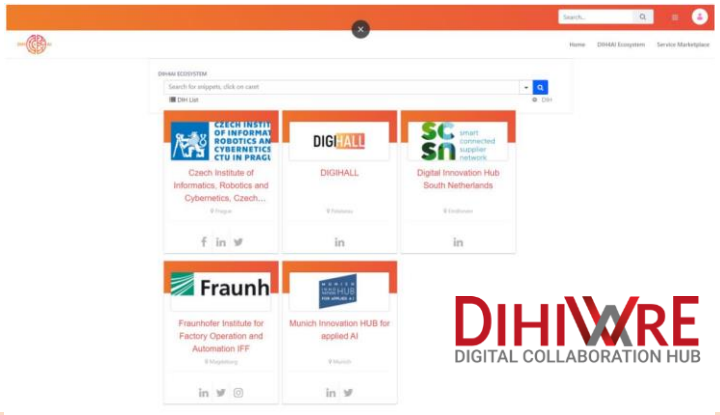
- DIHIWARE Portal for a single DIH
- For cross-DIH collaboration
- Cross-search capabilities with the AIoD
- Studying authentication issues (SSO)

Knowledge Platform

Innovation Capabilities

Marketplace

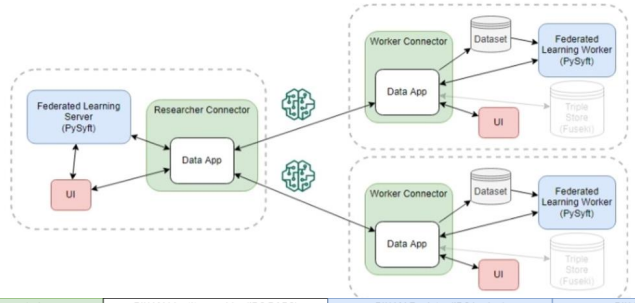
Collaboration Services

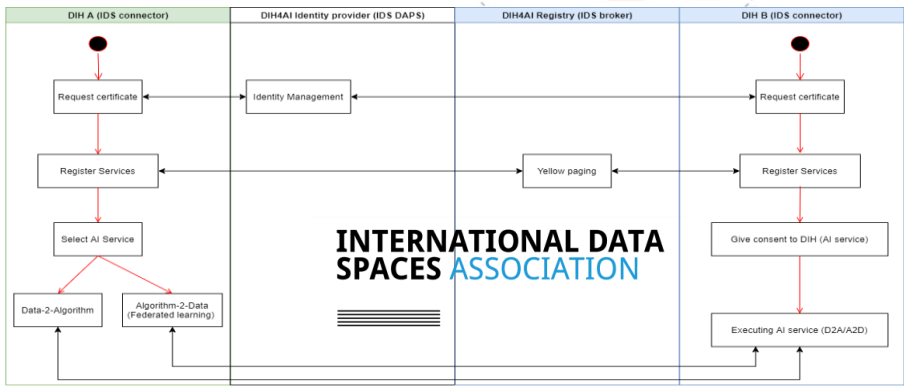


Data

A data space for DIHs

- Following IDS approach
- Experiments with federated learning in several DIHs in progress
- Any connection to the AIoD besides broker?

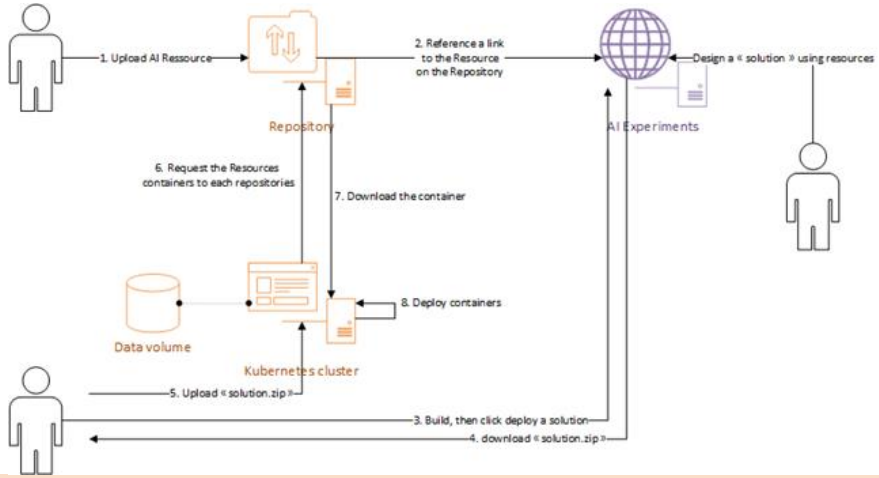




Cloud

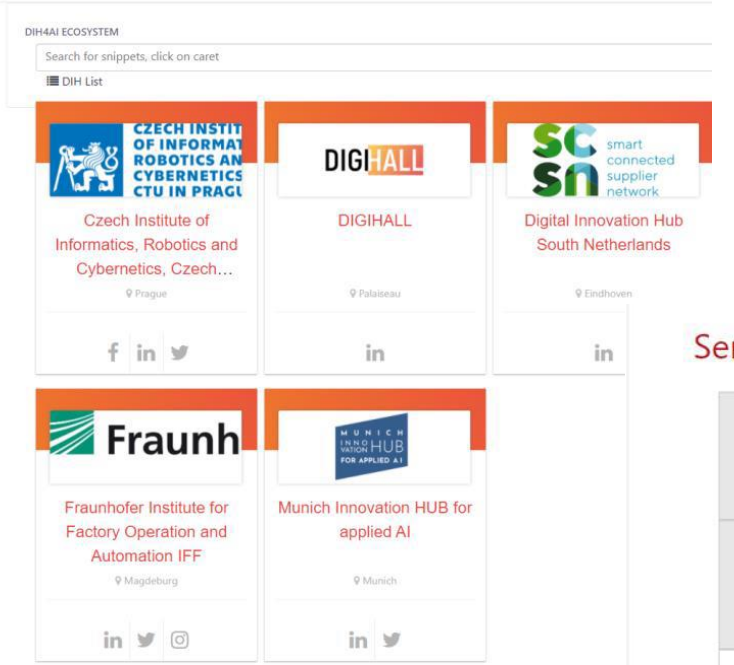
A Playground for experimentation for DIHs connected to the AIoD

- AIoD Experiments playground for DIHs
  - Repository
  - Execution space
- Kubernetes cluster with the playground available for DIHs experiments
- Connection to the AIoD platform
  - Towards automatic onboarding & publishing solutions to the AIoD
- And more coming… (Benoit)

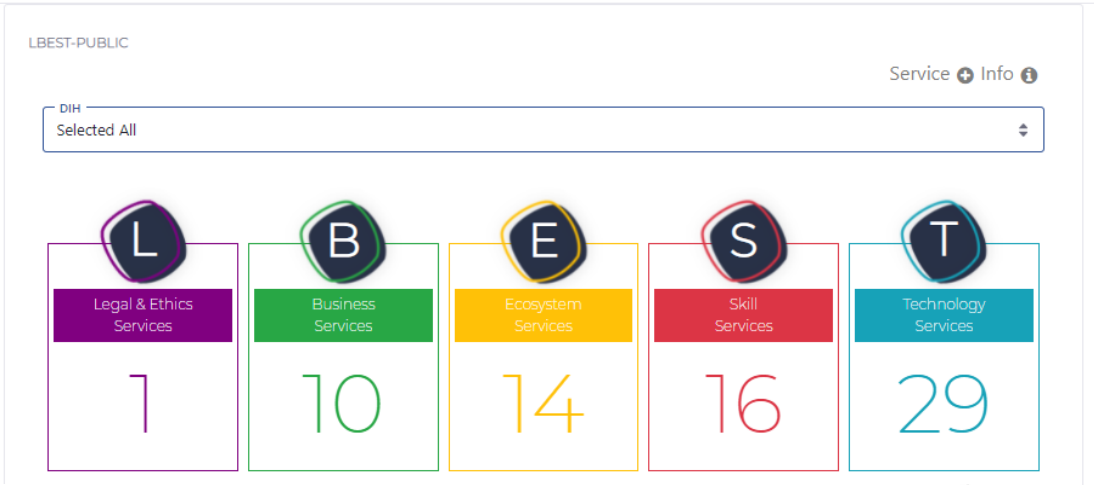


DIH4AI Portal
DIHIWARE

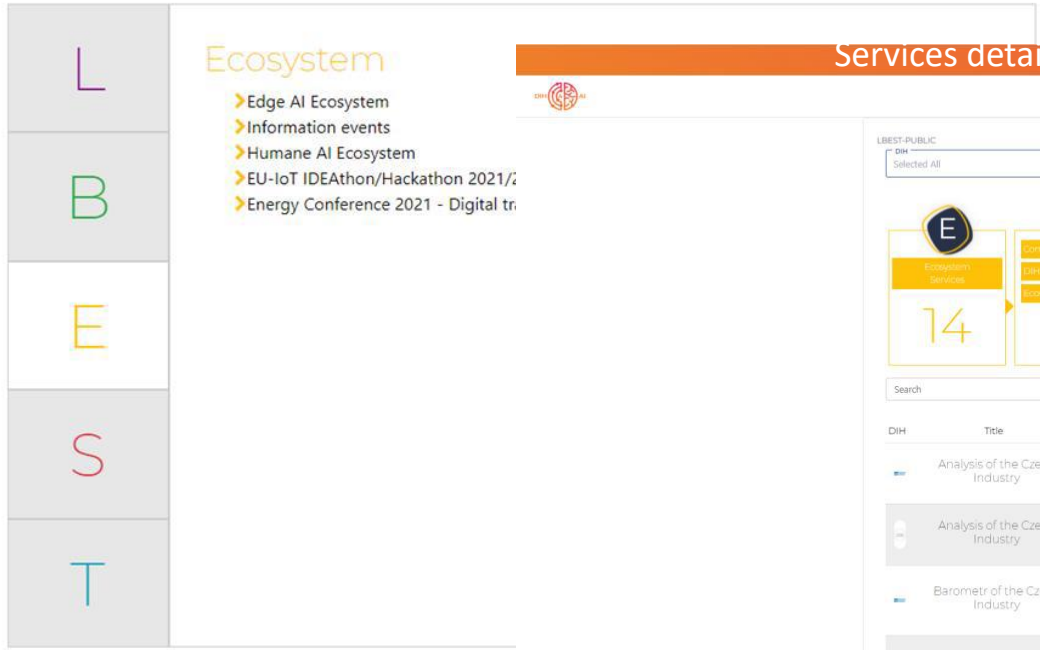
Main page



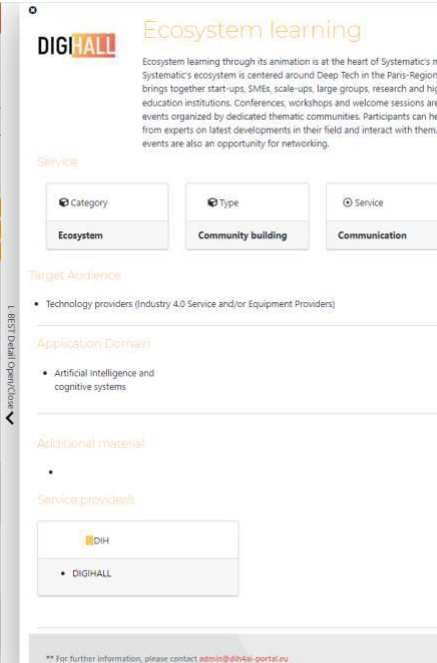
Services marketplace



Services Offered



Services detail



Representatives

Data interoperability – A data space for AI DIHs

IDS compliant Data Space for DIHs

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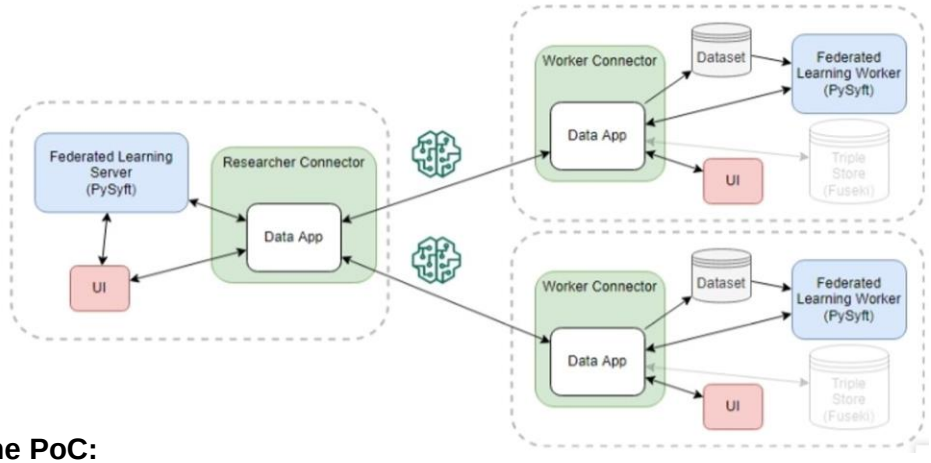
Federated learning PoC

Data remains at the source, the algorithm is only allowed to access the data, and performs an analysis locally. Then, it only returns the learned model from this location. In other words, the data remains at the source, but the algorithm is authorized to view the data and learn from it under agreements made.

Data interoperability- Federated learning PoC

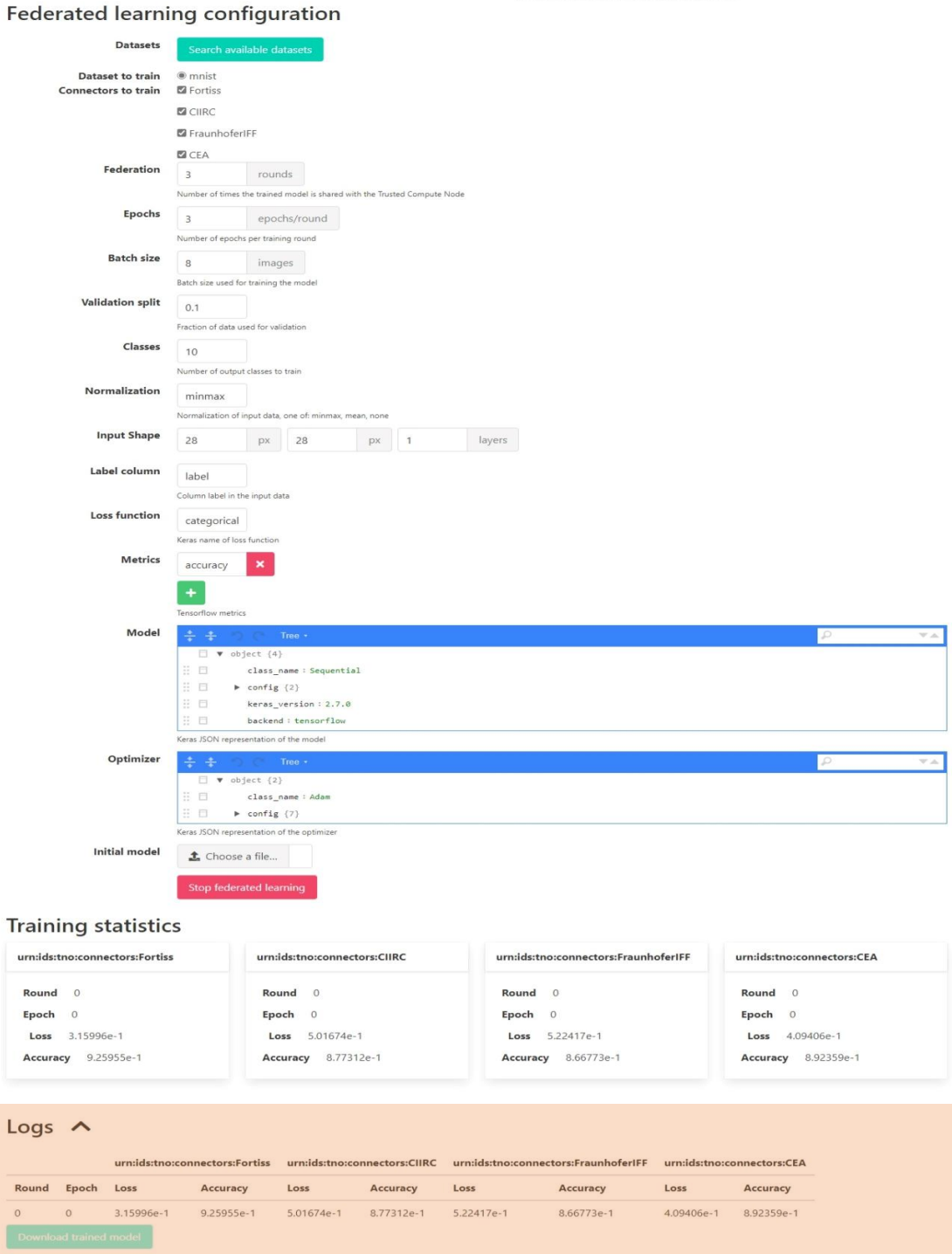


The PoC:
The quest is that each DIH in the example won't have all the data to recognize our 10 digits, however by learning from each other it is possible to recognize numbers data are not in your own data set (wisdom of the crowd).

- TNO DIH is the DIH providing the algorithm.
- The other DIH are the data providers.
- Example using EMNIST dataset in learning handwritten character digits.

Steps performed in the PoC:

- **Step 1** – TNO DIH (AI algorithm provider),
- **Step 2** – TNO DIH (Select other DIH and request access towards the data set. Then, configure the algorithm regarding federation rounds etc),
- **Step 3** –Each DIH to give access to their datasets. In this example each DIH offers an unique dataset (to avoid an overlap of data).
- **Step 4** – TNO DIH (end result of the learned model) and being able to recognize the number 0 to 9 due to the fact that the algorithm was allowed to learn locally and update the learned model constantly at TNO DIH location.

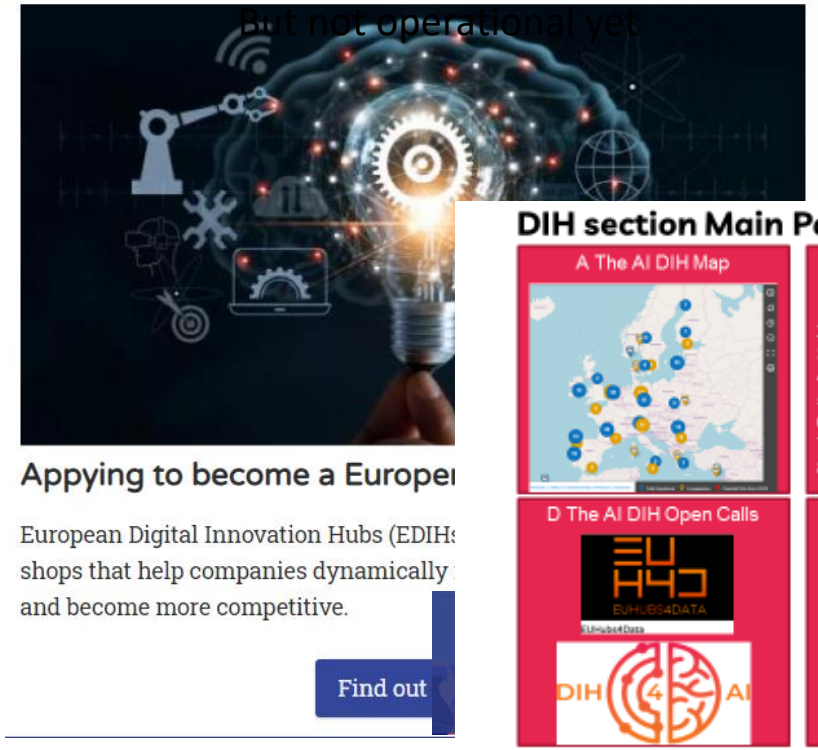


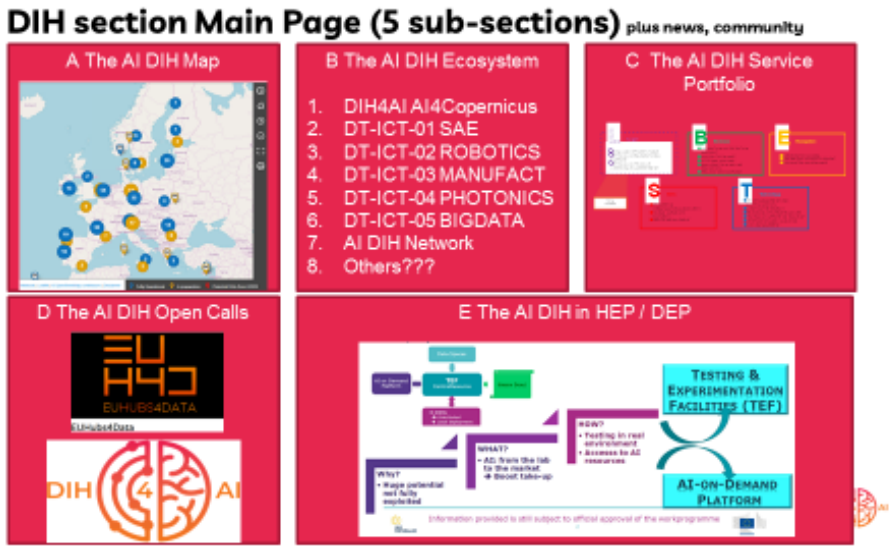
An extra integration topic: The AIoD Portal and its “AI DIH” section

The AIoD Portal and the AI DIH pages

A concrete operational proposal was approved in July 2021 TGB.

But not operational yet





- DIH4AI proposed to design, manage, and populate the section with the content.
- DIH4AI will do this with own resources.
- DIH4AI will involve and collaborate with other initiatives in the DIH space, such as DIH projects, DIH networks, EDIHs, etc. Initial contacts have been made with BOWI, AI REGIO, EUHubs4Data…
- DIH4AI, in collaboration with the AIoD CMS team, will set up the governance for the DIH section – the Editorial Board, which will include representatives of other initiatives.

- ***Next steps***: We need all together to sort out techinical/organizational issues to allow DIH4AI to get editorial access to the CMS of the ***the DIH section*** of the AIoD portal

@dih4ai

THANKS

DIH4AI Project

Follow the project updates

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