# AI research & innovation ecosystem mapping

Claudio Lazo (TNO)

June 18, 2024
AI4Europe event

# About the ecosystem mapping

- **Aim**:provide overview of organisations working on AI-related topics, and the application areas in which they are active
- **Scope**: 9 Networks of Excellence
- **Goal:** Develop a prototype
- **Method:** Use survey to collect data, agree AI categories and application areas

# Data collected

1. Organisation details (name, url, contact, type of org, type of activity, FTE, NoE membership)

1. Research topics activity levels per high-level topic
2. Research subtopics

1. Application area activity levels
2. Application area subtopics

# Research topics process

1. Subtopics synthesis (AAAI-23 and community-driven topics) into final structure
2. Start with the 12 research areas and 12 application areas of CLAIRE and combine with the AAAI-23 conference topics.
3. Changes at the top level were made only if it is justified (e.g. a more representative title). At the subtopics level, the NoEs were able to add as many topics as they want.
4. Maintain a maximum of 12 high level categories to keep it comprehensive
5. The high-level topics are alphabetically sorted, not implying any primacy.
6. Check with Working Committee

# Research topics & application areas

The ecosystem map requires a structured list of topics. The NoEs agreed to combine our initial structure the AAAI-23 keywords and topics provided by the NoEs, performing several reviews. Each topic has several subtopics (the amount of subtopics is shown after each topic). The topics are alphabetically sorted.

| Research topics | |
|---|---|
| AI Hardware & High-Performance Computing | 4 |
| Computer Vision & Audition | 36 |
| Ethical, Legal, Social Aspects | 34 |
| Human- Machine Interaction & Cognition | 32 |
| Knowledge Representation & Management | 17 |
| Machine Learning | 60 |
| Multi-Agent Systems & Agent-Based Modelling | 10 |
| Planning, Routing & Scheduling | 15 |
| Reasoning | 31 |
| Robotics | 19 |
| Search & Optimisation | 26 |
| Speech & Natural Language Processing | 27 |

| Application areas | |
|---|---|
| Agriculture & fisheries | 9 |
| Economy & financial markets/services | 9 |
| Environment, energy & sustainability | 18 |
| Health & wellbeing | 12 |
| ICT infrastructure | 4 |
| Industry | 11 |
| Learning & education | 10 |
| Media, communication, web & entertainment | 16 |
| Mobility & transportation | 18 |
| Public sector & citizen services | 6 |
| Safety & Security | 8 |
| Scientific research, design & engineering | 6 |

# Data collected

| NoE | # responses | # organisations |
|---|---|---|
| AI4Media | 32 | 32 |
| dAIEDGE | 20 | 35 |
| ELIAS | 14 | 32 |
| ELISE | 32 | 33 |
| ELSA | 17 | 27 |
| ENFIELD | 33 | 35 |
| euROBIN | 30 | 31 |
| HumanE-AI-Net | 45 | 54 |
| TAILOR | 46 | 55 |
| | | |
| **Total** | **269** | **334** |
| **Total (no dupl.)** | **228** | |

## Survey open since oct 2023

Mapping of the EU AI Landscape around the Networks of Excellence

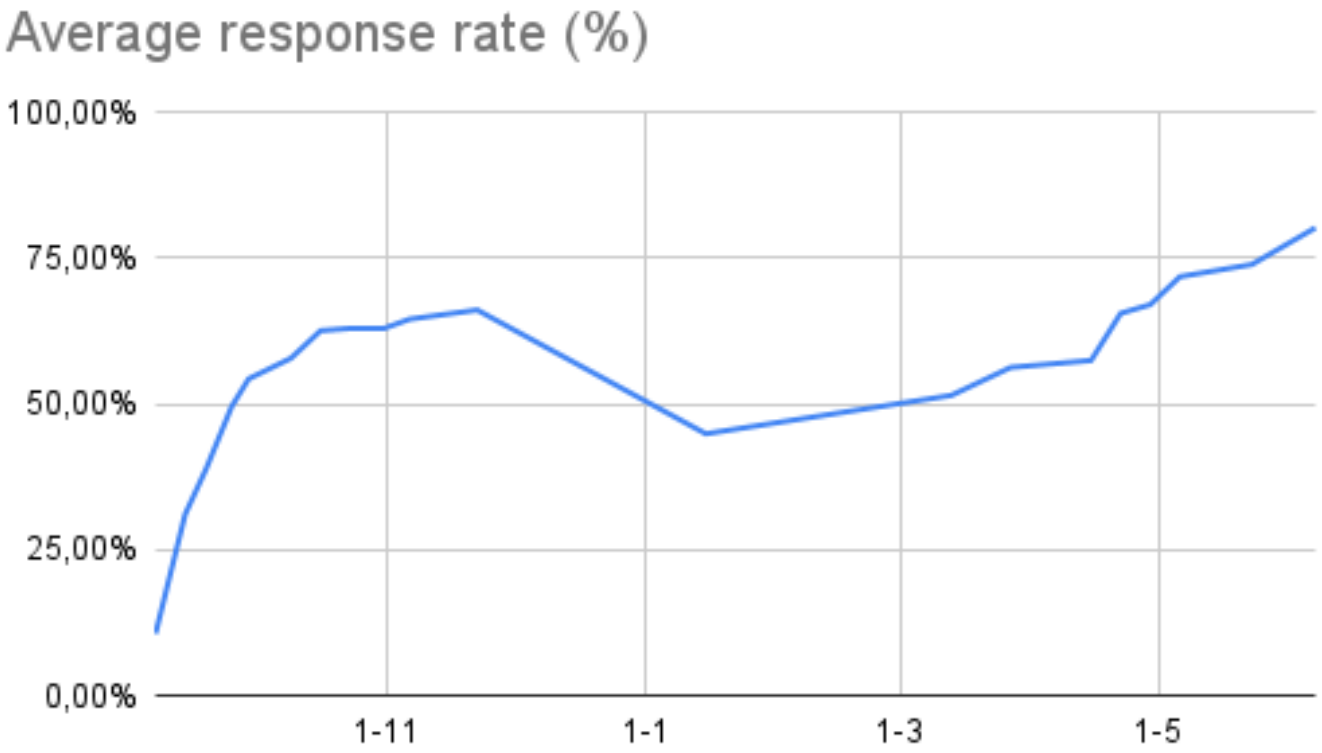
This survey is part of a **joint effort** of the AI research & innovation community and the European Commission.
Its aim is **to provide an initial mapping of the EU AI research landscape** around the European Networks of AI Excellence centres (NoEs):

- **AI4Media** - A European Excellence Centre for Media, Society and Democracy (https://www.ai4media.eu);
- **TAILOR** - Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization (https://tailor-network.eu);
- **Humane-AI-Net** - HumanE AI Network (https://www.humane-ai.eu/);
- **ELISE** - European Learning and Intelligent Systems Excellence (https://www.elise-ai.eu);
- **euROBIN** - European ROBotics and AI Network (https://eurobin-project.eu);
- **ELSA** - European Lighthouse on Secure and Safe AI (https://elsa-ai.eu)

Three new Networks of Excellence emerged during the data collection phase, and organisations in these networks can fill in this survey as well:

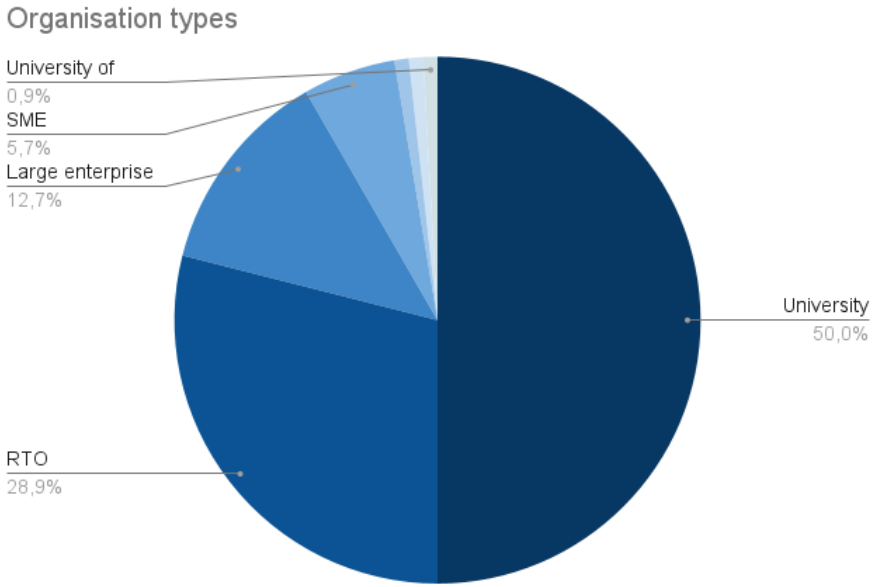
- **dAIEDGE** - A network of excellence for distributed, trustworthy, efficient and scalable AI at the Edge (https://daiedge.eu/)
- **ELIAS** - European Lighthouse of AI for Sustainability (https://elias-ai.eu/)
- **ENFIELD** - European Lighthouse to Manifest Trustworthy and Green AI (https://www.enfield-project.eu)

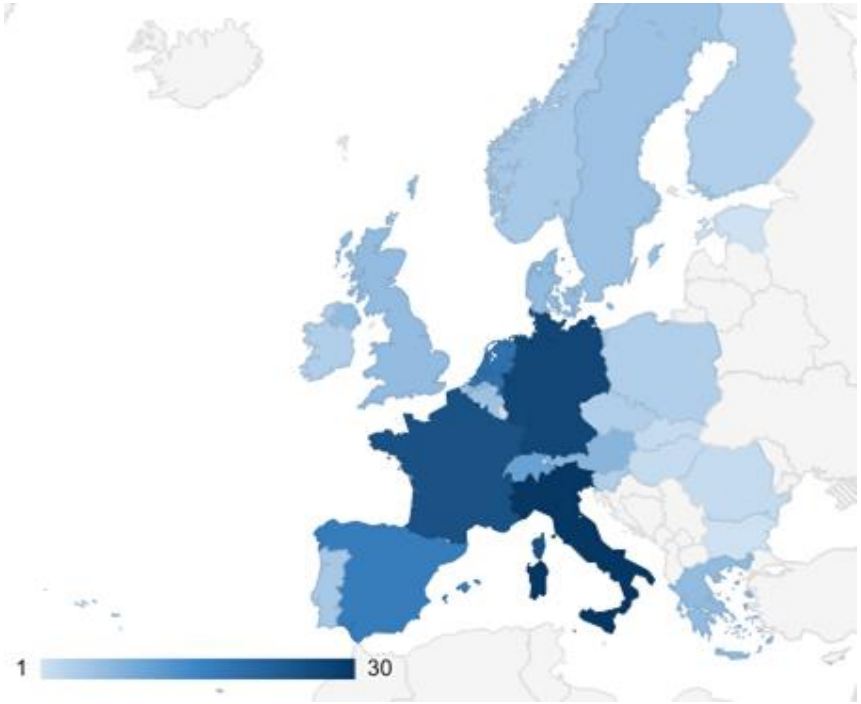
The survey has been created in close consultation with a representative from each NoE together with input from the EC, and is facilitated by the VISION CSA (Value and Impact through Synergy, Interaction and coOperation of Networks of AI Excellence Centres).




Response rate (juni 2024): 80,5%

# Data collected



# How to use the tool

eu-ai-ecosystem.tnods.nl

# Value

## Shared language

- List of AI research topics & application areas
- Find suitable categories
- Search organizations by topic

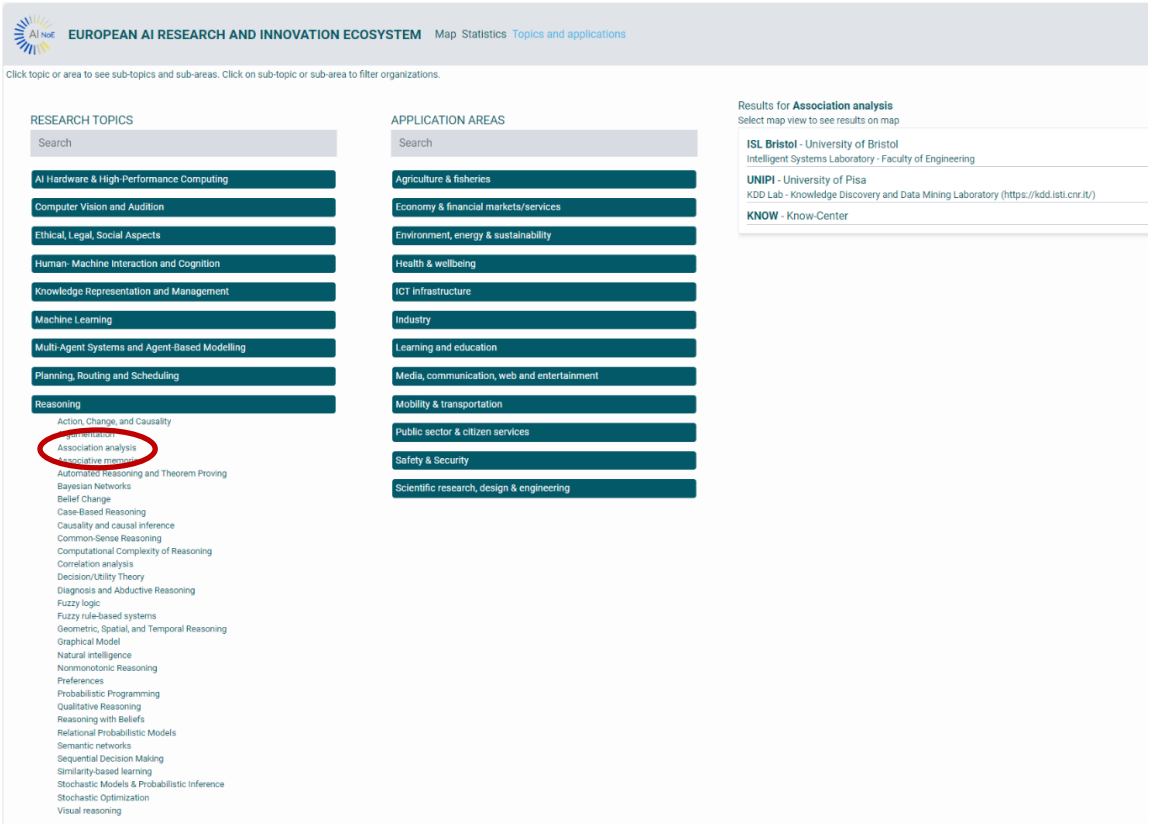
## Detailed reporting on organizations

- Positioning their expertise
- Branding

## High-level overview

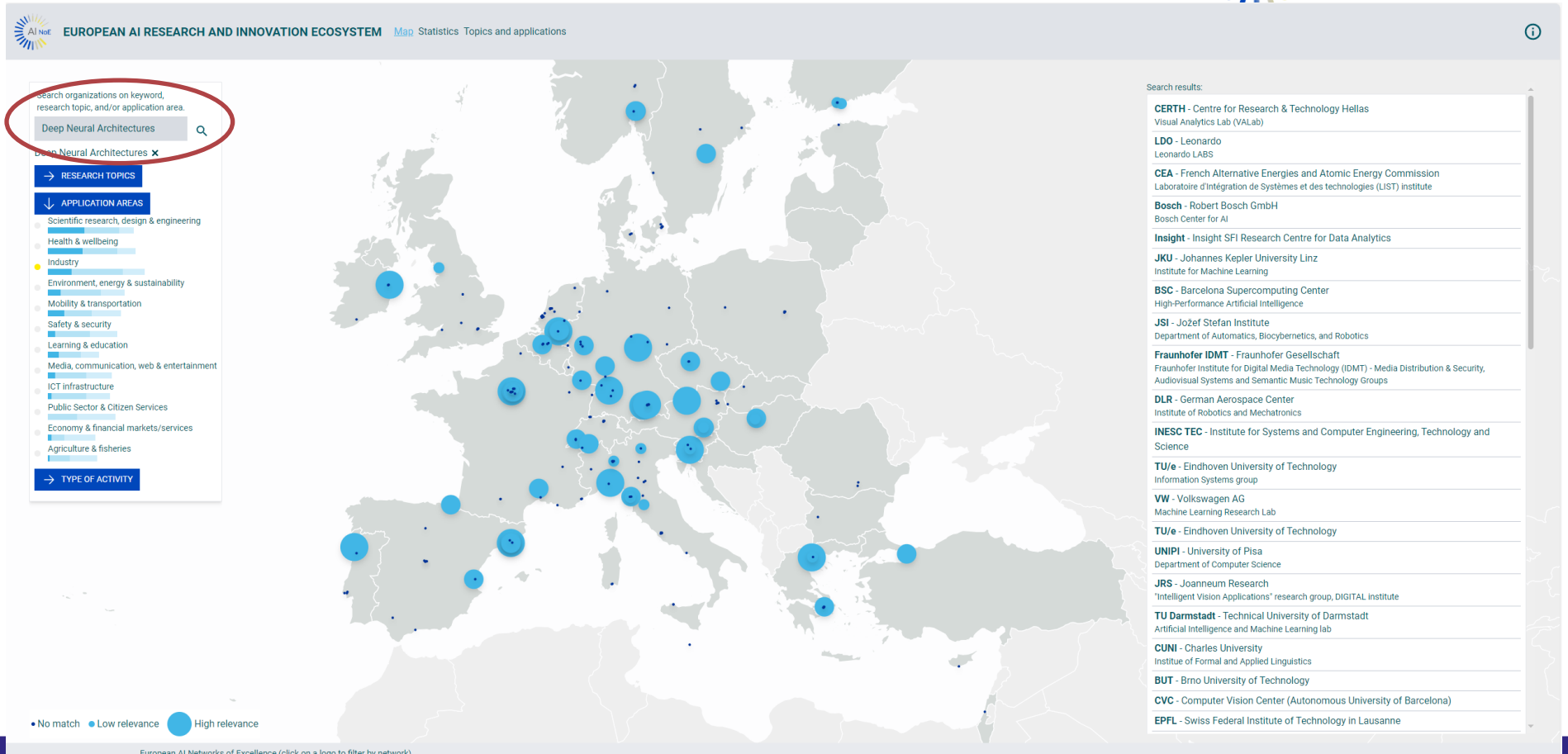
- Map of European AI R&D excellence
- Visualizing NoEs
- Lab to market
- Research topics x application areas
- Reporting on AI research (sub)topic

# Shared language

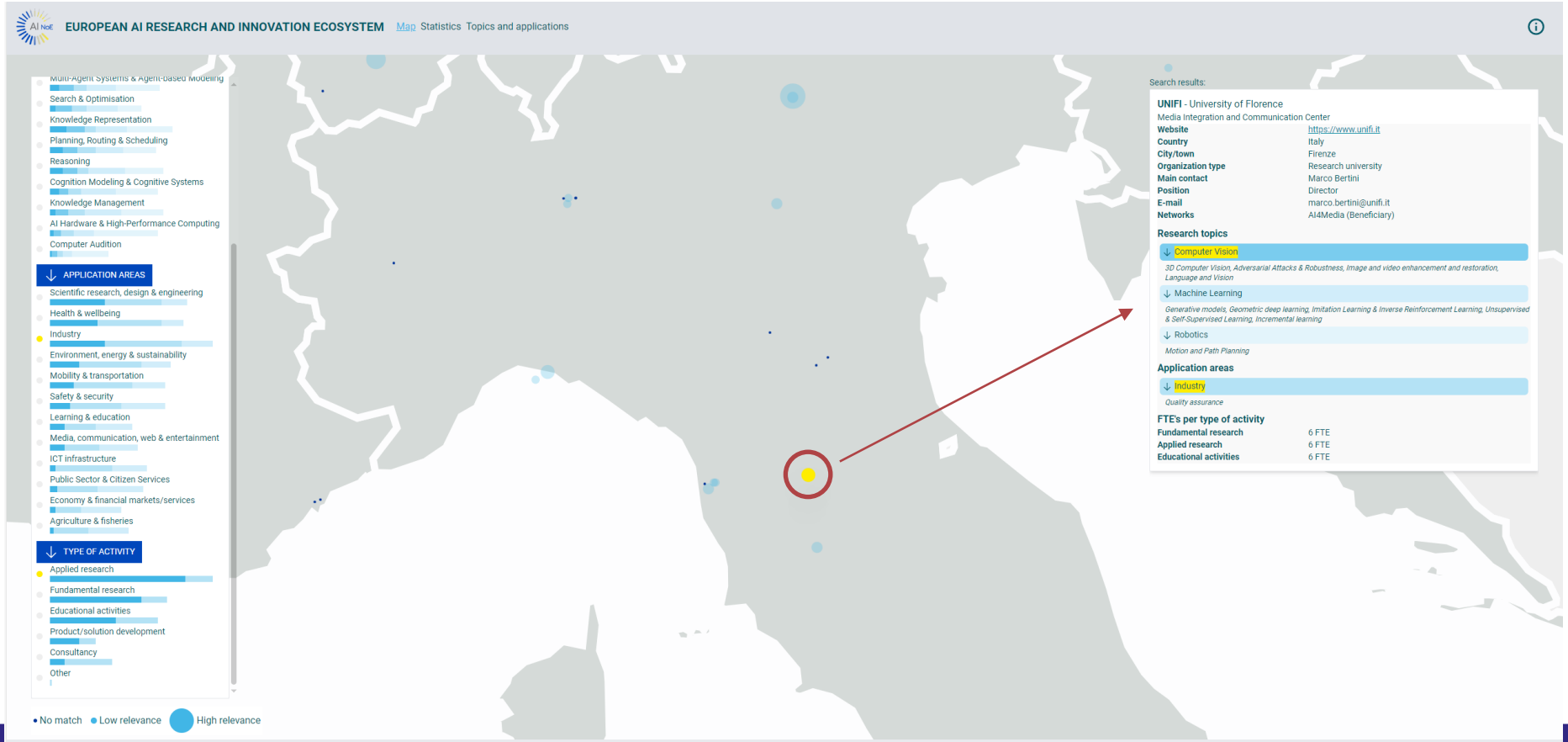



Funded by the European Union

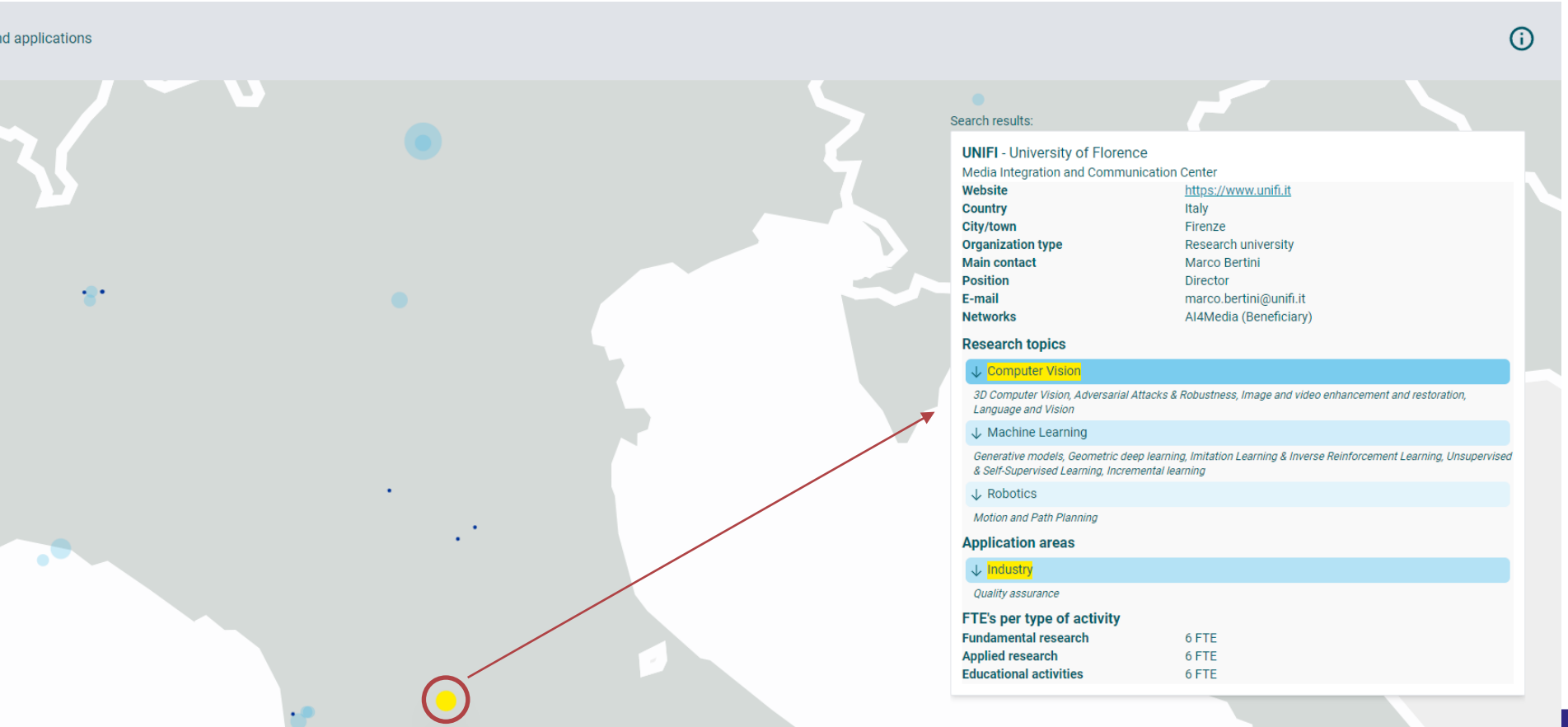
# Searching by topic



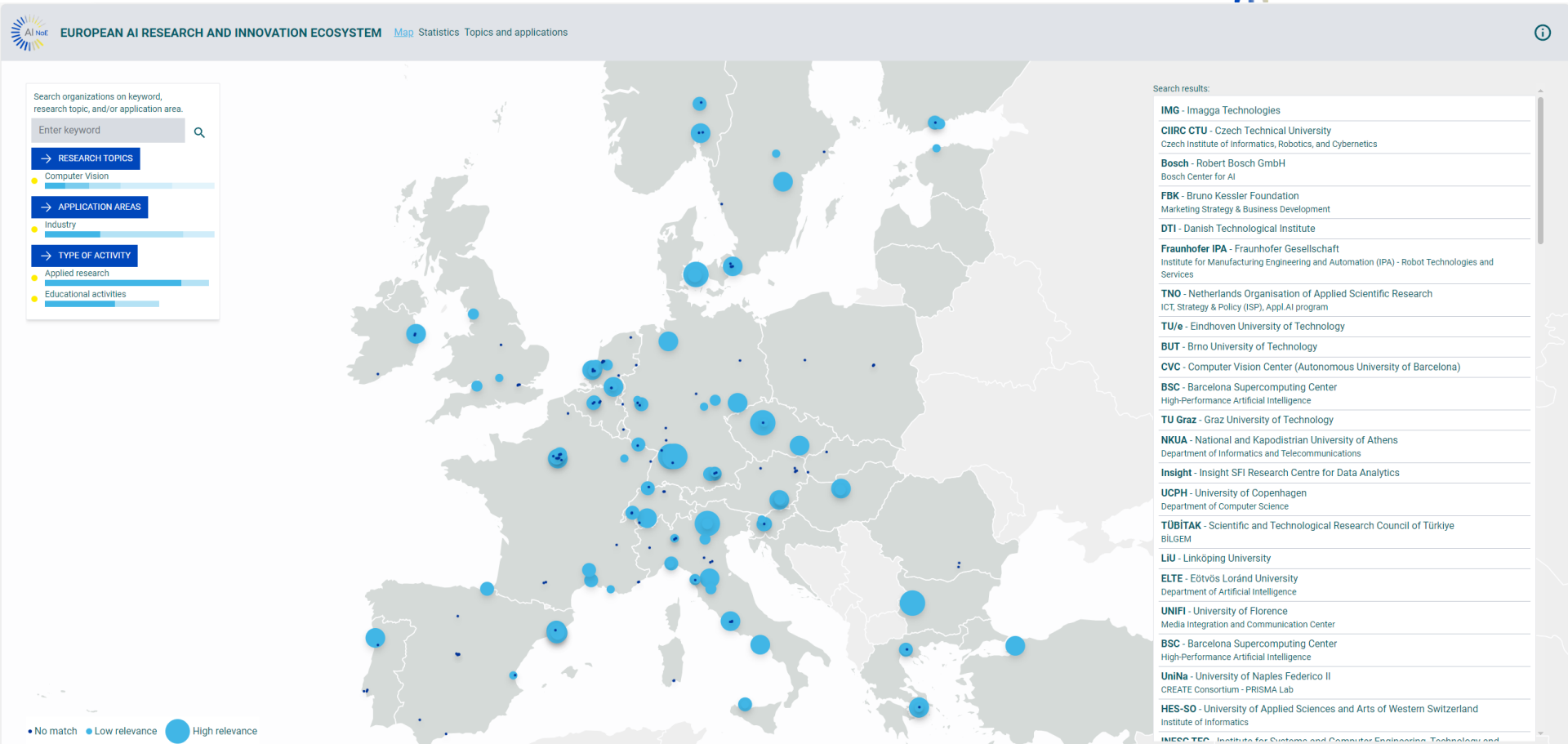
# Detailed reporting on AI R&D organizations



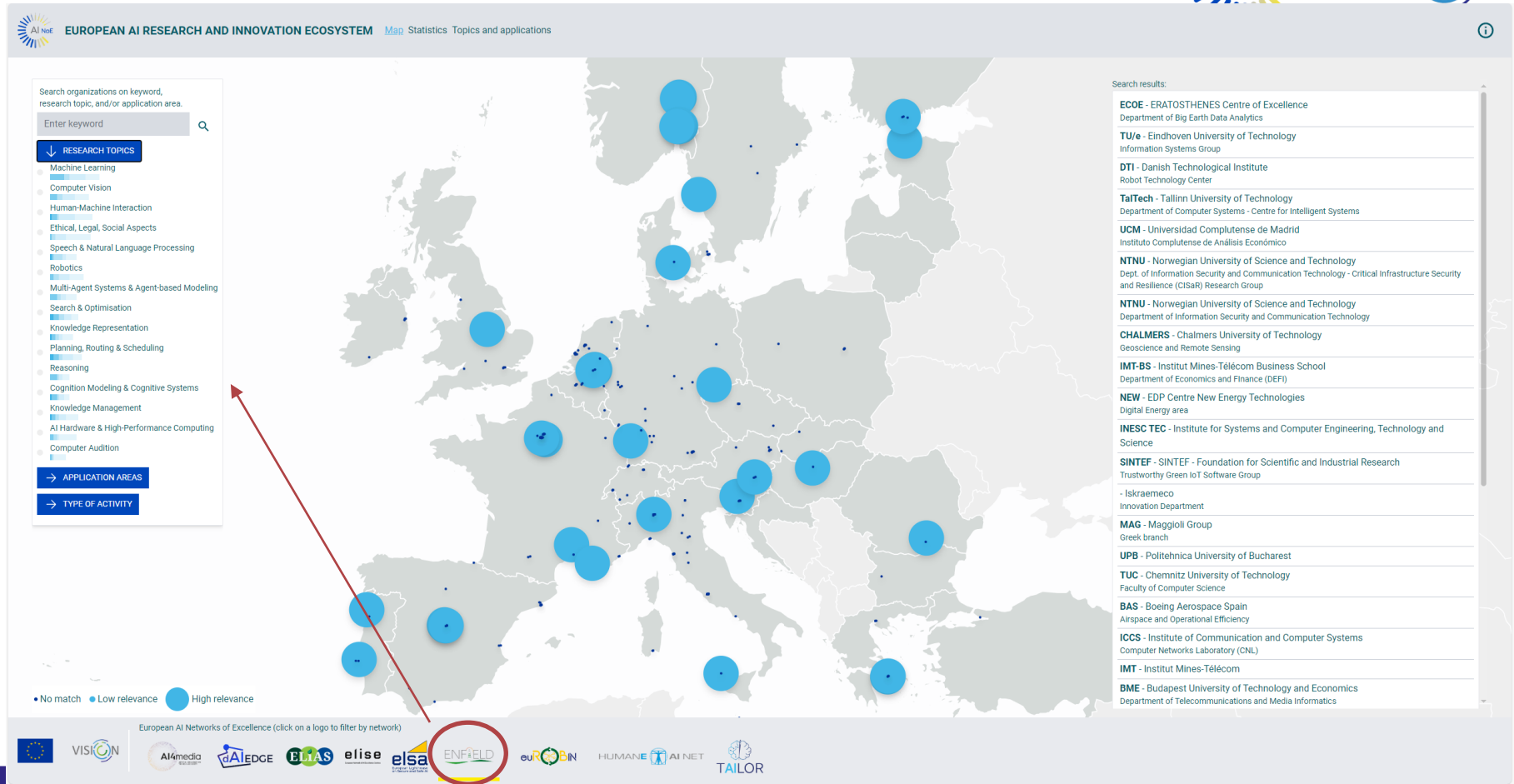
# Detailed reporting on AI R&D organizations



# Overview: Visualizing AI R&D excellence



# Overview: Visualizing NoE expertise



# Overview: Research in application areas

Funded by the European Union

# Overview: Lab to market

Funded by the European Union

# ADRA joint topic group

# Joining forces

Combining similar efforts, so we don’t end up with several concurrent mappings
Organised in a dedicated joint topic group of Adra

Initiating organisations:

- TNO (VISION, NoE Ecosystem Mapping)
- UTwente (Adra-e cartography)
- UCC (AI-on-demand platform, European R&D mappings)
- …

# Adra joint topic group (JTG) on Ecosystem Mapping & Information Repository

Mission

Maximize the effectiveness of the AI, Data and Robotics (ADR) community

by supporting the development and maintenance of an ecosystem mapping and information services that are of **value to the ADR research & innovation community.**

**The AI, Data and Robotics Association (Adra)**

On May 21, 2021, BDVA, CLAIRE, ELLIS, EurAI and euRobotics founded **Adra (AI, Data and Robotics Association, asbl)** joining forces and integrating a wide range of stakeholders into the activities of the Partnership. Adra is the private side of the AI, Data and Robotics Partnership in Horizon Europe.

# Similar initiatives

- Adra-e cartography (UTwente)
- RODIN information repositories (TNO, euRobotics)
- BOWI DIH heatmap (TNO)
- DIHs catalogue (TNO)
- ELLIS lab catalogue (ELISE)
- TAILOR mapping of AI topics for SRIR v2 (TNO)
- AI Navigator (Insight Centre, UCC)

# Strategic impact of the JTG

## Maximize the effectiveness of the AI, Data and Robotics (ADR) community

### 1
**Coordinated ADR R&I info mapping**

A rigorous organization around the information provisioning of the ADR research and innovation ecosystem

- Responsible body
- Open, democratic decision-making

### 2
**Valuable services to ADR community**

Development of a set of valuable services to support the the effectiveness of the ADR community

- Mapping
- Benchmarking
- Finding funding
- Matchmaking
- Showcasing
- Emergence radar

### 3
**Focused channel with EC**

A focused channel for discussion with the EC on information provisioning for ADR research and innovation

- Excellence
- Visibility
- Representation

### 4
**A shared language**

A categorization of ADR research topics and application areas that reflect European values.

- Research topics
- Application areas
- By the ADR community
- For the ADR community

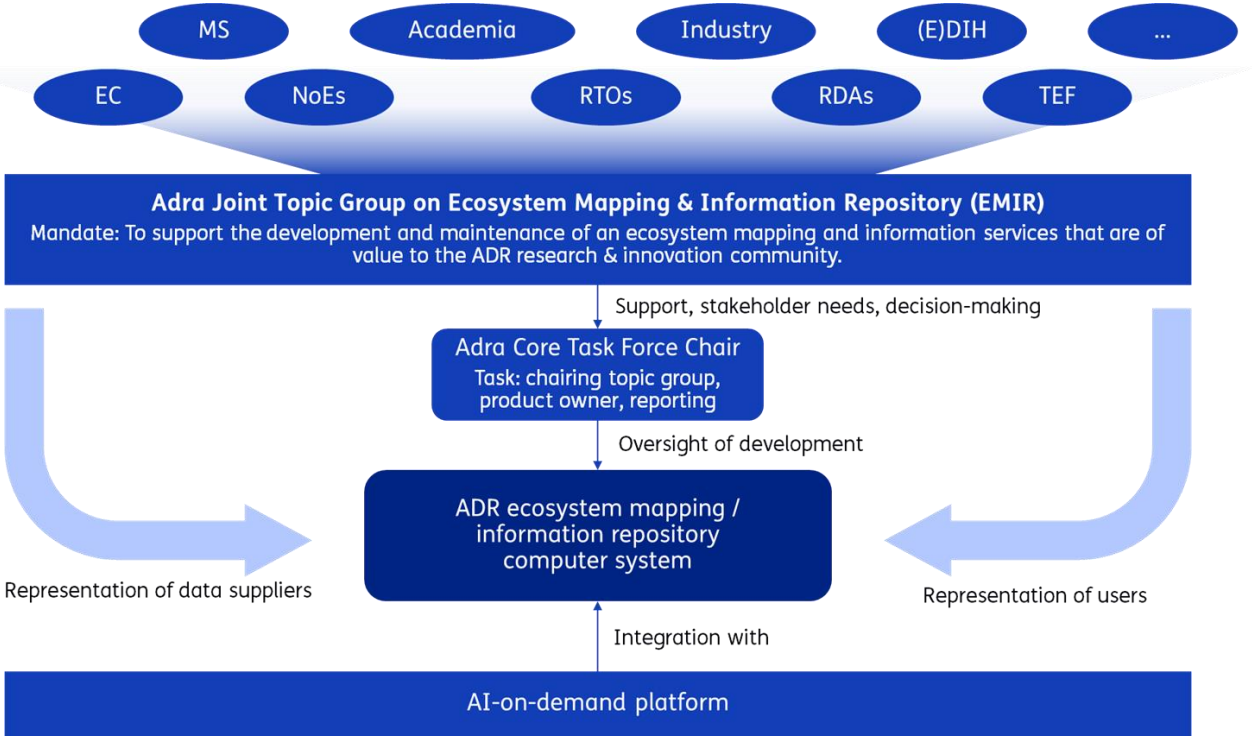
# JTG functions

1. Democratic, diverse, and open forum

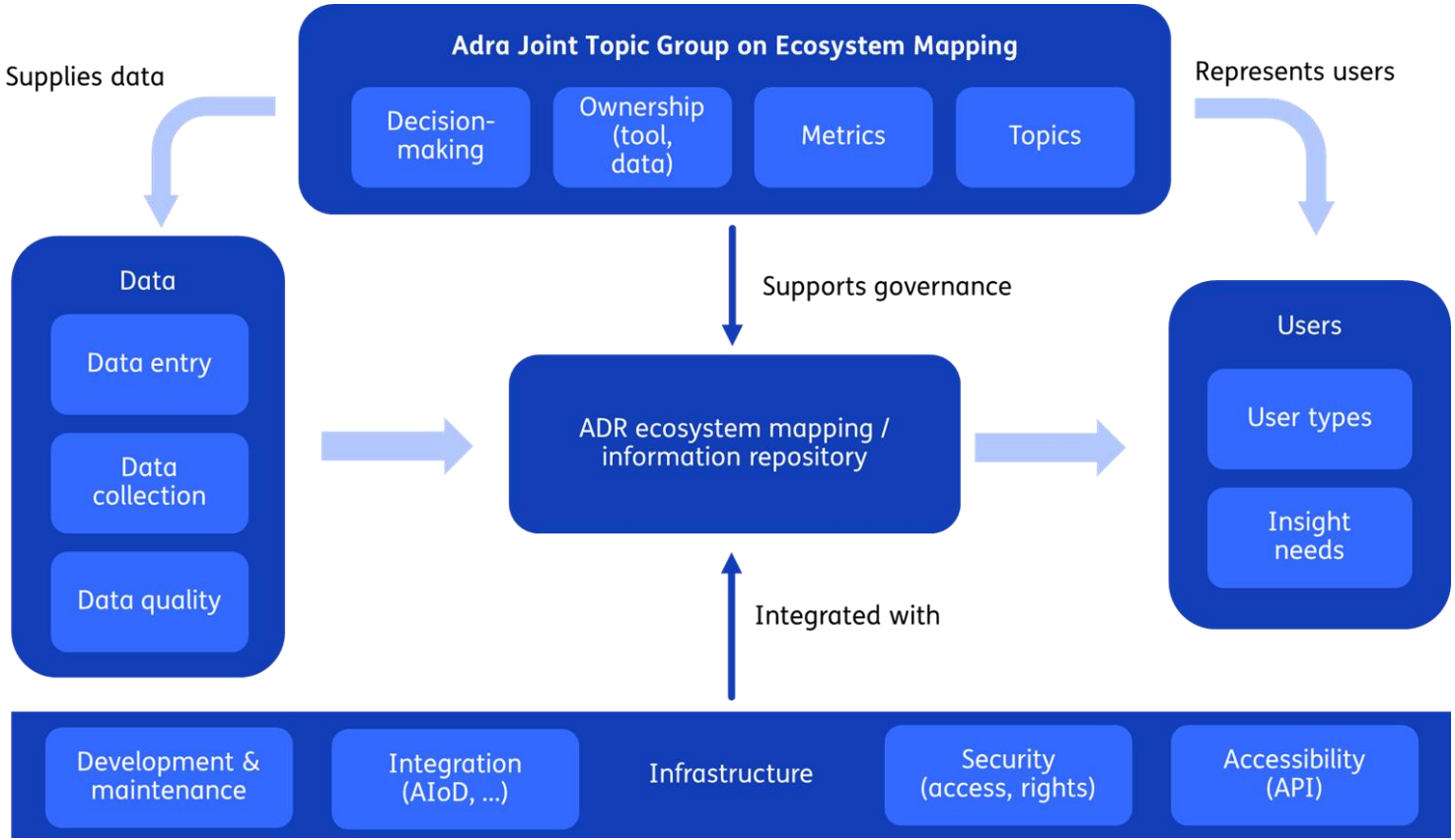
1. Growing coalition of stakeholders

1. Representation

1. Oversight



# Governance


Adra Joint Topic Group on Ecosystem Mapping
Decision-making
Ownership (tool, data)
Metrics
Topics
Supplies data
Represents users
Supports governance
Data
Data entry
Data collection
Data quality
ADR ecosystem mapping / information repository
Users
User types
Insight needs
Integrated with
Development & maintenance
Integration (AIoD, ...)
Infrastructure
Security (access, rights)
Accessibility (API)

# JTG main activities year one

| | | |
|---|---|---|
| 01 | **Governance** | • Establish an organizational governance<br>• Invite more stakeholders to join |
| 02 | **Extend categorization** | • Extend the categorization of research topics and application areas for a wider scope of research, innovation and applications in the ADR community |
| 03 | **Extend scope** | • Extend the scope of the mapping to organizations in the AI, Data & Robotics community, but that were not included in the initial NoE-based mapping |
| 04 | **Architecture** | • Establish architectural principles (e.g. open source, machine-readability, transparency) for the minimum viable product (MVP)<br>• Establish requirements for the MVP |
| 05 | **Business case** | • Establish a business case for the mapping<br>• Value proposition and earning model<br>• Funding requirements |
| 06 | **Funding & development** | • Organise funding<br>• Commission and oversee the development and maintenance of the MVP |

# United in Diversity

*Make Europe a research powerhouse in human-centred, trustworthy AI!*

www.vision4ai.eu

info@vision4ai.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952070.

*This material reflects only the author's views. The EC is not liable for any use that may be made of the information contained therein.*