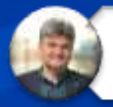
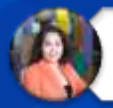

Maurits Butter


Claudio Lazo


Long Pham


Anne Bergen


Kristina Karanikolova

Mapping the European AI, data and robotics ecosystem

Kickstarting the Adra joint topic group on Ecosystem Mapping & Information Repository (EMIR)

Nov 5, 2024

Funded by the European Union

Agenda

13:15	Introduction	Anne Bergen
13:20	Sneak preview of the new joint Strategic Research Agenda	Maurits Butter
13:30	Ecosystem mapping and the Adra EMIR joint topic group	Claudio Lazo
13:40	Integration with the AI-on-Demand Platform	Long Pham
13:50	Brainstorm and group discussion	Kristina Karanikolova
14:30	Wrap-up and conclusion	Anne Bergen

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Introduction

Anne Bergen

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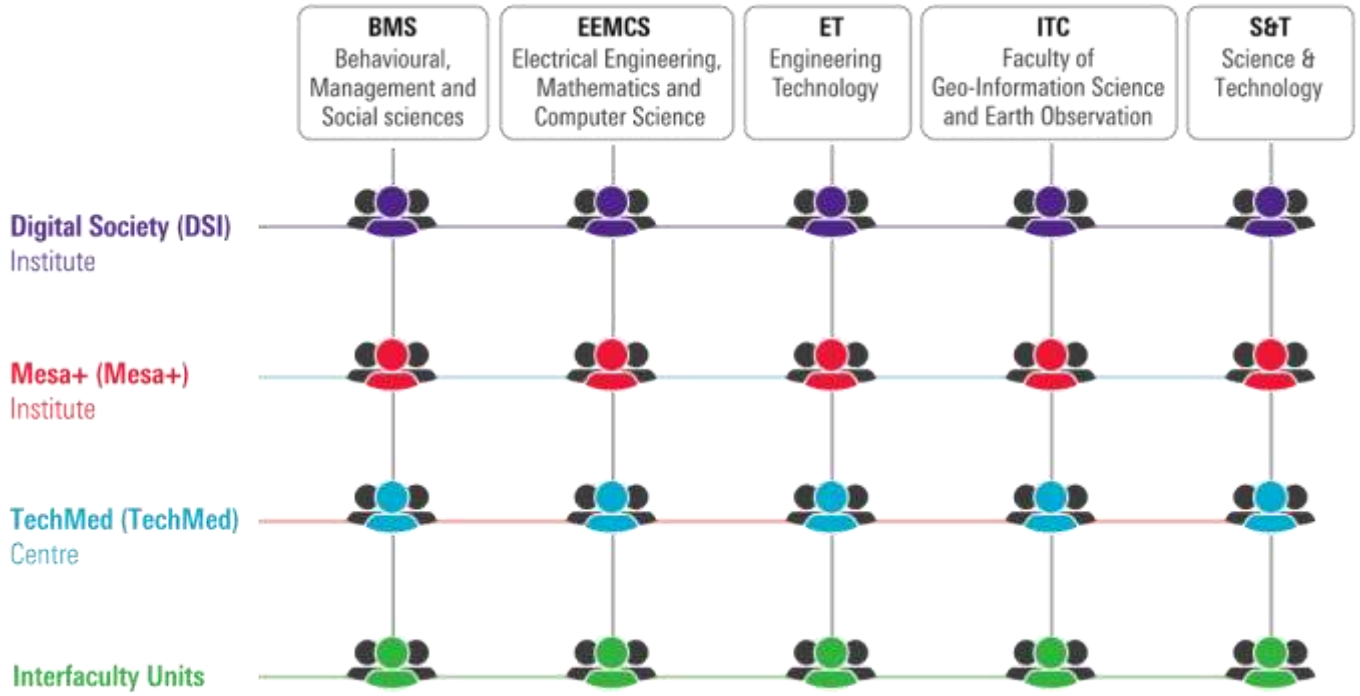
the European Union

OUR STORY UNIVERSITY OF TWENTE

The University of Twente is the place where science, technology, and engineering meet social sciences. Thanks to our **high-tech** with a **human touch**, UT students and researchers make an impact on society every day.



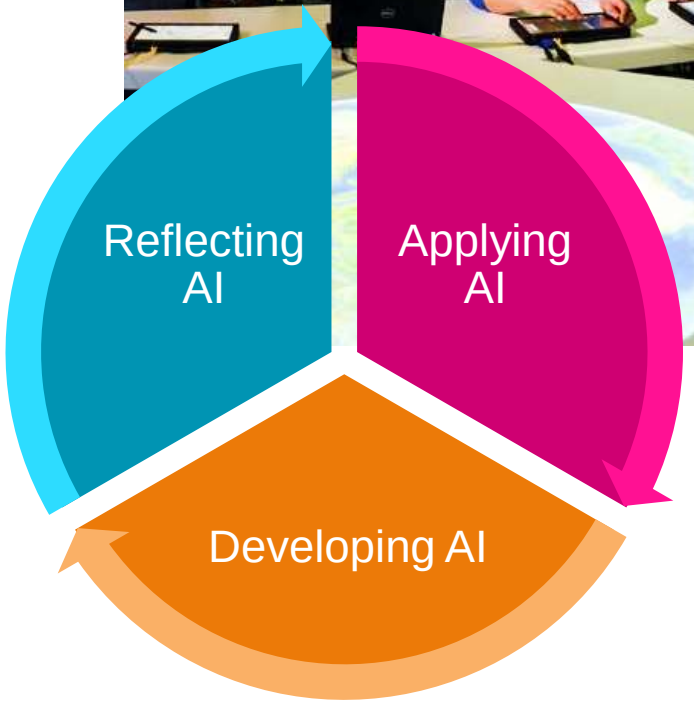
TOTAL # OF STUDENTS **2022: 12.493**	12.209
# OF EMPLOYEES **FTE**	3,729
TOTAL # SPIN-OFF **SINCE 1984**	1.100

OUR DIGITAL SOCIETY

Our task is to drive digitalization in close cooperation with all our stakeholders. We focus on five themes: Data Science & **AI**, Smart Industry, eHealth, Robotics and Cybersecurity.

AI @ UNIVERSITY OF TWENTE

# OF STUDENTS WORKING AI	3.000+
# OF EXPERTS	150+
# GROUPS WORKING AI	30+



MAPPING OUR EXPERTS

- Divided in 3 main categories
- Updated automatically
- Filter to find your expert

APPLYING AI (10)

DR. J.M. WOLTERINK (JELMER)
Associate Professor | EEMCS-AM-MIA

DR. V. GROENHUIS (VINCENT)
Assistant Professor | EEMCS-EE-RAM

DR.ING. G. ENGLEBIENNE (GWENN)
Assistant Professor | EEMCS-CS-HMI

DR.IR. K. NIU (KENAN)
Assistant Professor | EEMCS-EE-RAM

DR.IR. M. ABAYAZID (MOMEN)
Associate Professor | EEMCS-EE-RAM

DR.IR. M. VLUTTERS (MARK)

APPLYING AI

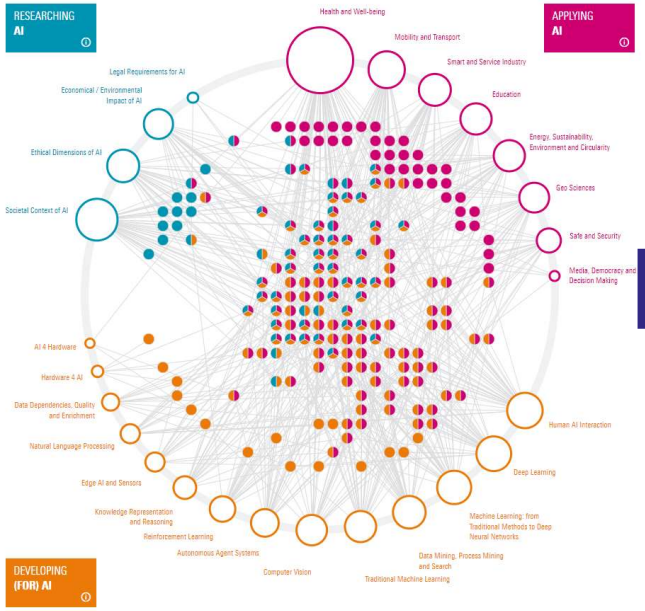
- [ ] Education (29)
- [ ] Energy, Sustainability, Environment and Circularity (29)
- [ ] Geo Sciences (27)
- [x] Health and Well-being (70)
- [ ] Media, Democracy and Legal Decision Making (4)
- [ ] Mobility and Transport (35)
- [ ] Safe and Security (21)
- [ ] Smart and Service Industry (30)

DEVELOPING (FOR)

- [ ] AI 4 Hardware (3)
- [ ] Autonomous Agent S
- [x] Computer Vision (28)
- [ ] Data Dependencies, Enrichment (12)
- [ ] Data Mining, Process Search (31)
- [ ] Deep Learning (33)
- [ ] Edge AI and Sensors
- [ ] Hardware 4 AI (6)
- [ ] Human AI Interactior
- [ ] Knowledge Represen Reasoning (19)
- [ ] Machine Learning: fr Methods to Deep Ne
- [ ] Natural Language Processing (15)
- [ ] Reinforcement Learning (22)
- [ ] Traditional Machine Learning (29)

Reset filters

MAPPING EXPERTS AND MORE



Experts mapped for only one organizations and only AI

Add

- Multiple organizations
- Various stakeholders
- EU instruments
- …

Not a trivial task!

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

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.**

TNO innovation for life

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

UNIVERSITY OF TWENTE.

The innovation ecosystem layer

Maurits Butter

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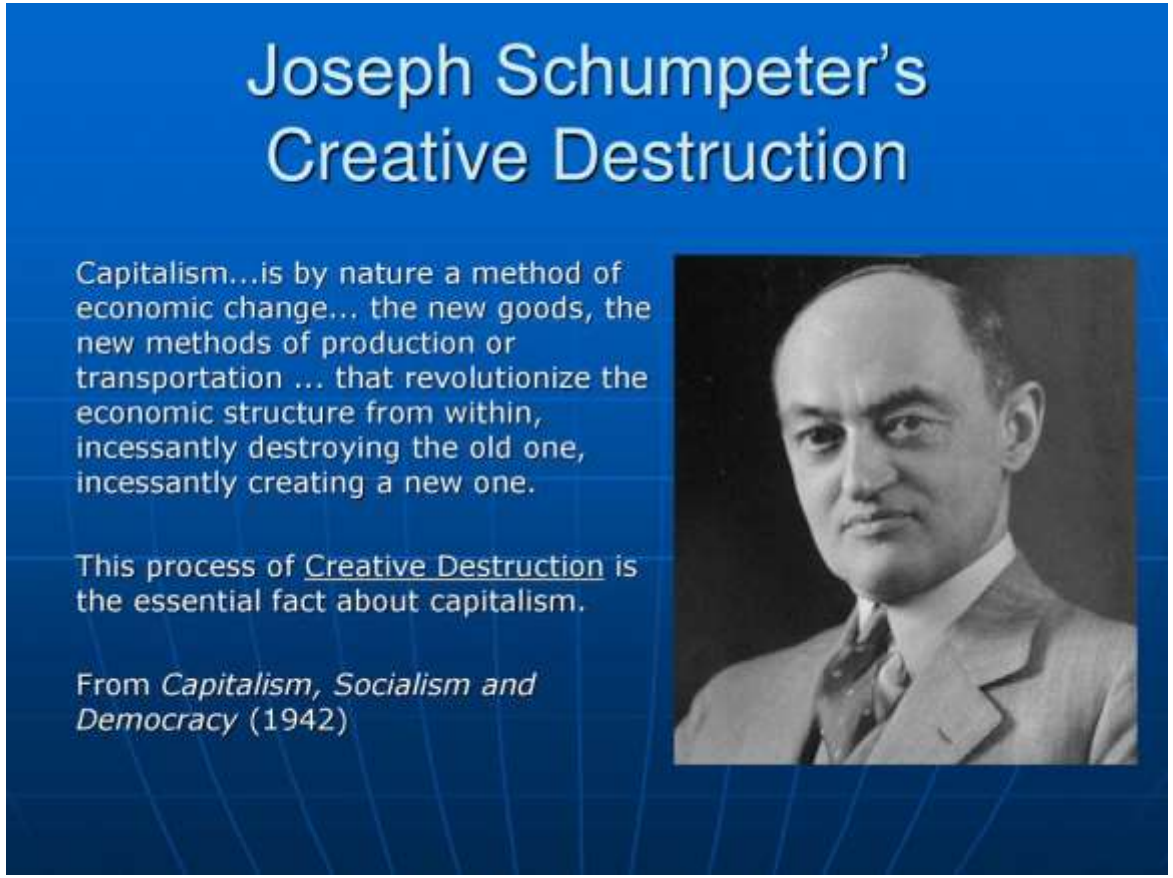
The world has changed and creative distruction is not enough



We need a coordinated effort to ensure Europe is leading!

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There are many actors involved

The Corporate Innovation Ecosystem: Understanding the Players, Tensions, and Key Strategic Questions

XPLANATIONS by XPLANE

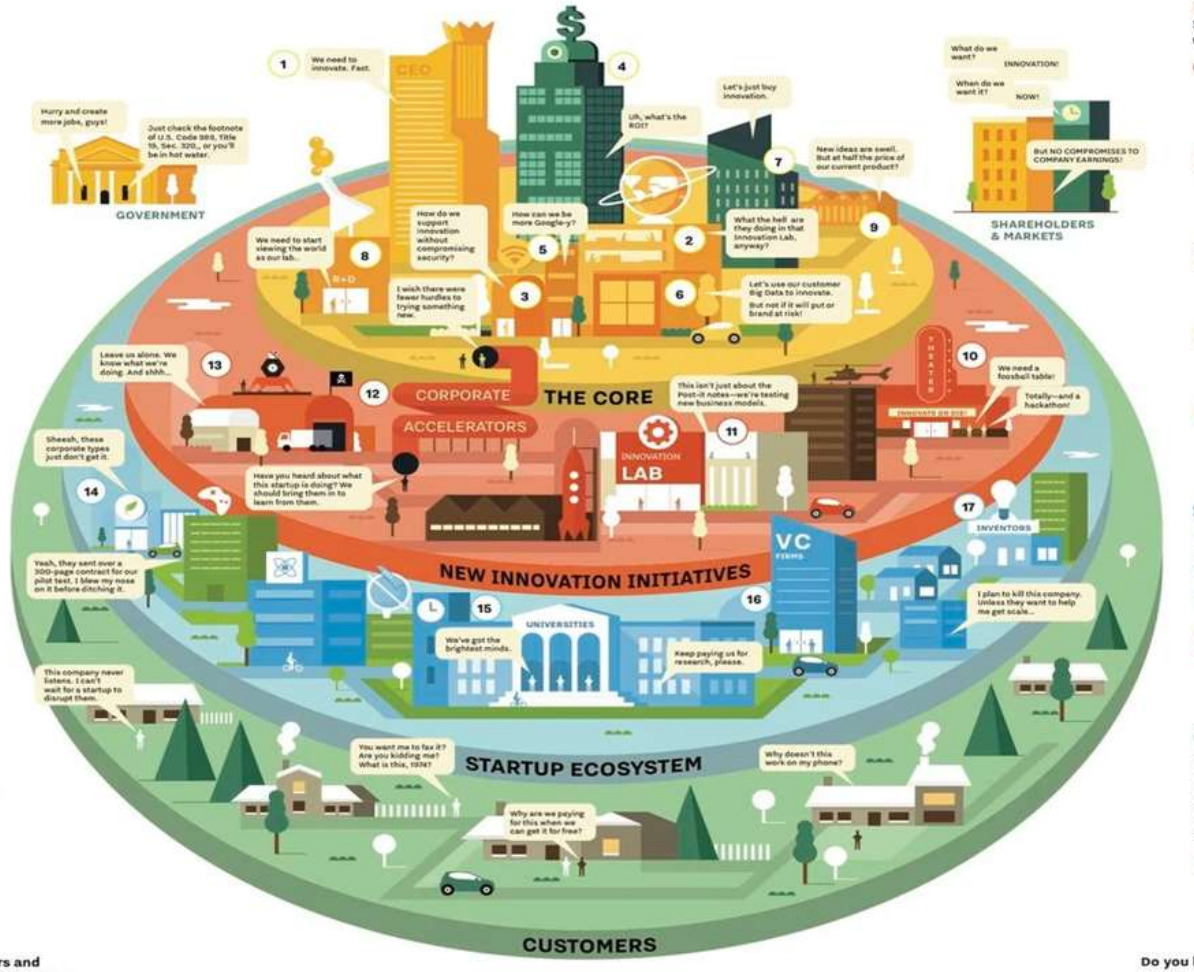
Why is corporate innovation so difficult? A broad coalition of players, inside and outside of your organization, must be aligned for real innovation to take hold—and the different constituencies don't always share the same motivations and incentives. Use this map and the discussion questions below to engage the players, start conversations, and build a shared understanding of common goals, so that you can work together to make meaningful progress.

THE CORE

The core business is the source of profits and power. When it's doing well, there's little hunger for real innovation. When it's struggling, the first impulse is to cut costs rather than invest in new products and services. Without long-term support from executives in the core, innovation efforts fail.

1. **CEO and Leadership Team**
   At some companies, a sole C-level executive is the key innovation cheerleader. Innovation groups benefit from broader support throughout the core business, though it's best to avoid creating a 20-person innovation committee that can find plenty of reasons to kill promising projects.
2. **Business Units**
   Business units tend to want incremental ideas that can deliver revenue in the short-term, rather than disruptive innovations that might undercut the current offering.
3. **IT, Finance, HR, and Marketing**
4. Some of these functions can slow the momentum of innovation teams, dwelling on risks or following
5. "standard procedure." Some may feel they should own
6. innovation. It's best to start cultivating allies early rather than late.
7. **Corporate Development**
   "Buying innovation" through acquisitions is something many companies prefer over organic innovation, though the price can be steep and integration can be a challenge.
8. **Research and Development**
   Companies with long-standing R&D groups sometimes feel frustrated. Should all ideas about the future of the business come from R&D? These groups can also be insular and reluctant to source solutions from outside the company. But R&D done right can attract top talent and create competitive advantage.
9. **Sales and Support**
   Sales can be a rich source of insights about customer problems, which innovation groups would be wise to address. The sales and support teams can also gripe about selling something that's tough to support, priced too low, or relies on a different business model.

DISCUSSION QUESTION:
What incentives can you put in place for these constituencies to embrace new ideas and help launch them, rather than poking holes and withholding resources?



NEW INNOVATION INITIATIVES

Innovation initiatives tend to sit at the edge of the business, without the same resources or attention as the core.

10. **Innovation Theater**
    Coming soon...the splashiest spectacle you've ever seen! Watch the CEO pass out trophies. Marvel as a visiting keynote speaker shares the secrets to brilliant ideas in 60 minutes or less. It can be exciting the first time around, but will people return for the sequel?
11. **Innovation Labs and Incubators**
    At their best, innovation labs create a new place for exploring new technologies, building prototypes, and collaborating with customers. At their worst, they're Disney-esque showcases intended to impress visitors and prospective hires.
12. **Corporate Accelerators**
    With the right structure and marketing, accelerators can attract startups working in your industry, and potentially spark investments, pilot tests, and partnerships.
13. **Skunk Works**
    Insulated from near-term demands, this crew can focus on "blue sky" projects with major potential. The risk? Insufficient support from the core business when it's time for launch.

DISCUSSION QUESTIONS:
What is the expected outcome from your innovation initiative, over what timeframe? What resources will you need?

STARTUP ECOSYSTEM

14. With so many internal meetings, it can be tough for executives to
15. escape the building. Innovation teams seek to change that
16. dynamic by creating new ways to connect with startups,
17. university researchers , venture capitalists, and even solo inventors who may supply winning solutions to a crowdsourcing competition.

DISCUSSION QUESTIONS:
How can you reduce the friction of working with outsiders, and position your company as the "collaborator of choice" in your industry?

CUSTOMERS

At most companies, sales and marketing departments feel like they "own" the customer relationship, but a growing number of companies embracing the concepts of "lean startup," "design thinking," or "customer co-creation" are allowing more employees to interact with customers. Even when this doesn't result in new revenue, it can strengthen customer loyalty, which is always a win.

DISCUSSION QUESTIONS:
What barriers exist to bringing customers into the innovation process? How can you quickly and cheaply test new concepts with them?

INNOVATION LEADER **Learn more about these players and questions at www.innovationleader.com**

Do you have something you need to explain? ©XPLANE.com 2017
Download the PDF at www.xplane.com/innovationecosystem

d by
ropean Union

There are many actors in the ADR ecosystem

chambers of commerce

manufacturers

regional governments

vocational training institutes

innovation incubators

IAs

suppliers

system integrators

NoE

EIC

EIF

EEN

consultants

industrial networks

technology parks

EIT

EDIHs

ADRA

RTOs

industry platforms

CSAs

Private banks

EIB

industry associations

SMEs

national research counsils

universities

NGOs

big corporations

regional development agencies

European Commission

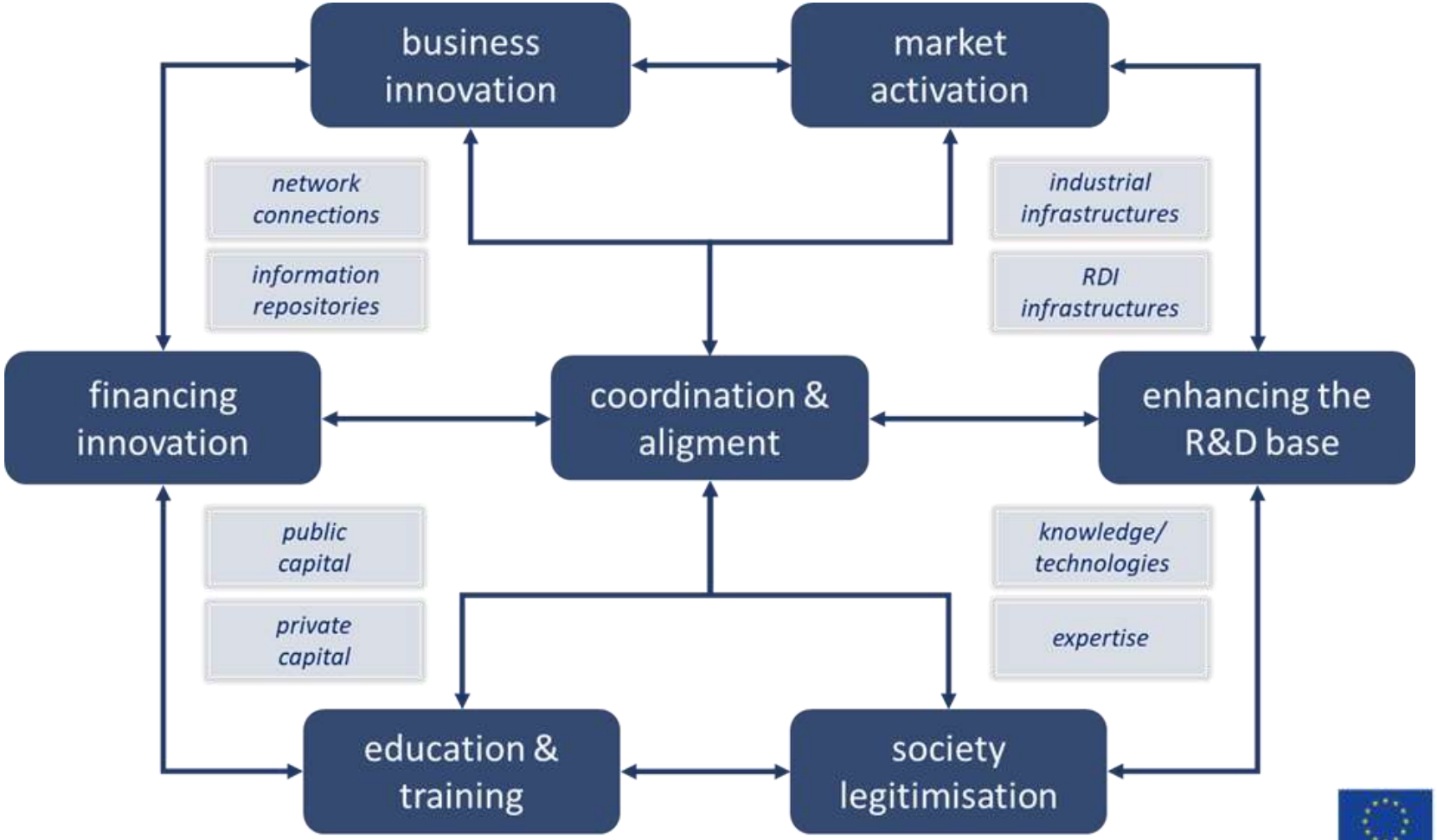
Venture capitalists

DIHs

national governments

national regulatory bodies

A collaborative set of functions supporting the innovation ecosystem is needed!



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Mapping will enable…

- Identify the gaps and overlaps in the innovation ecosystem
  - Increasing efficiency and effectiveness of the ecosystem and policy interventions
- Identify
  - Iden , competitiveness
- Provide information where specific innovation activities are addressed
  - The starting point for collaboration, alignment of investments, access to capacities/capabilities, benchmarking, community building
- A collective repository of information
  - Access to knowledge, information, showcases, technologies

A well functioning innovation ecosystem!

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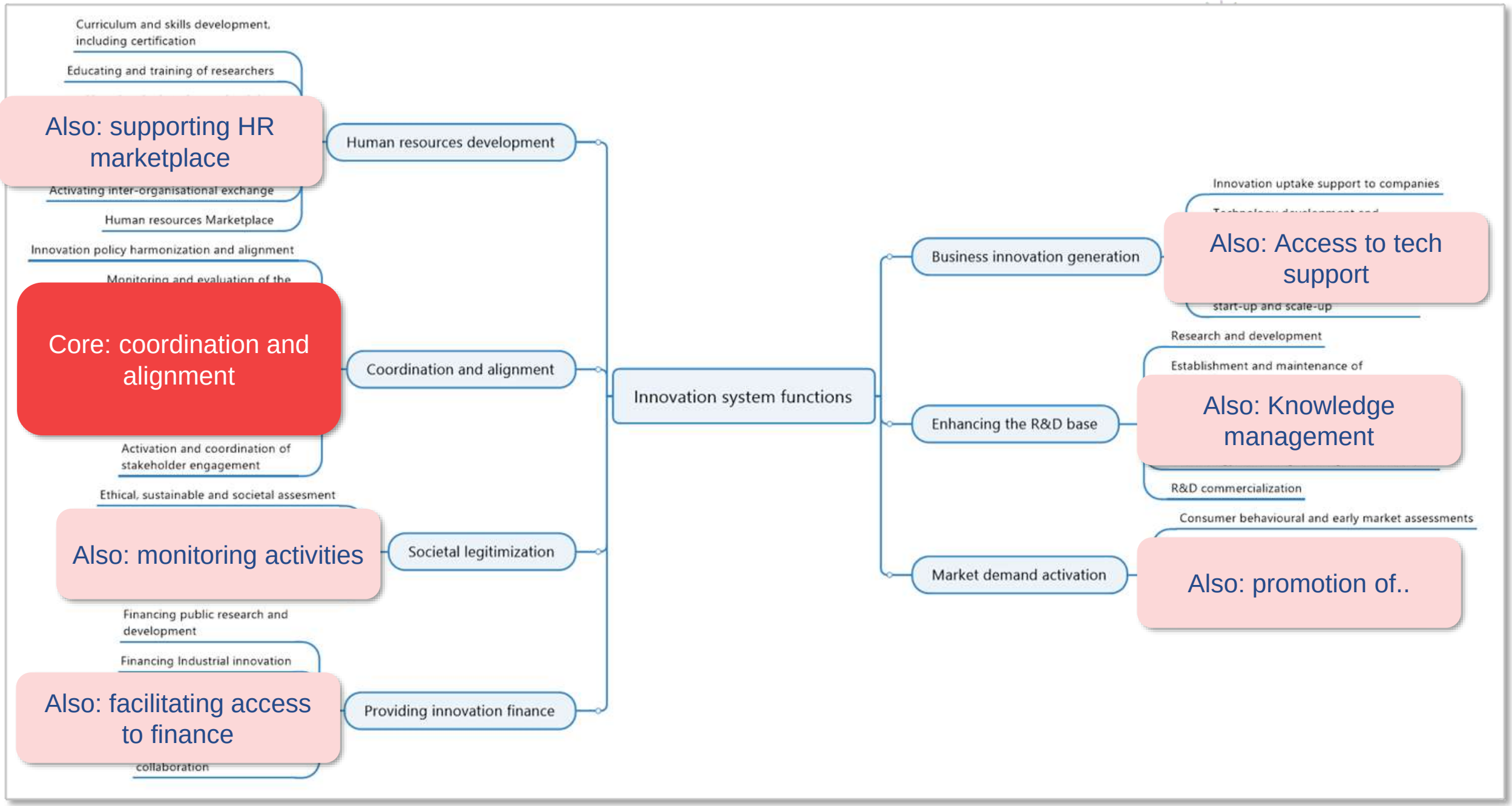
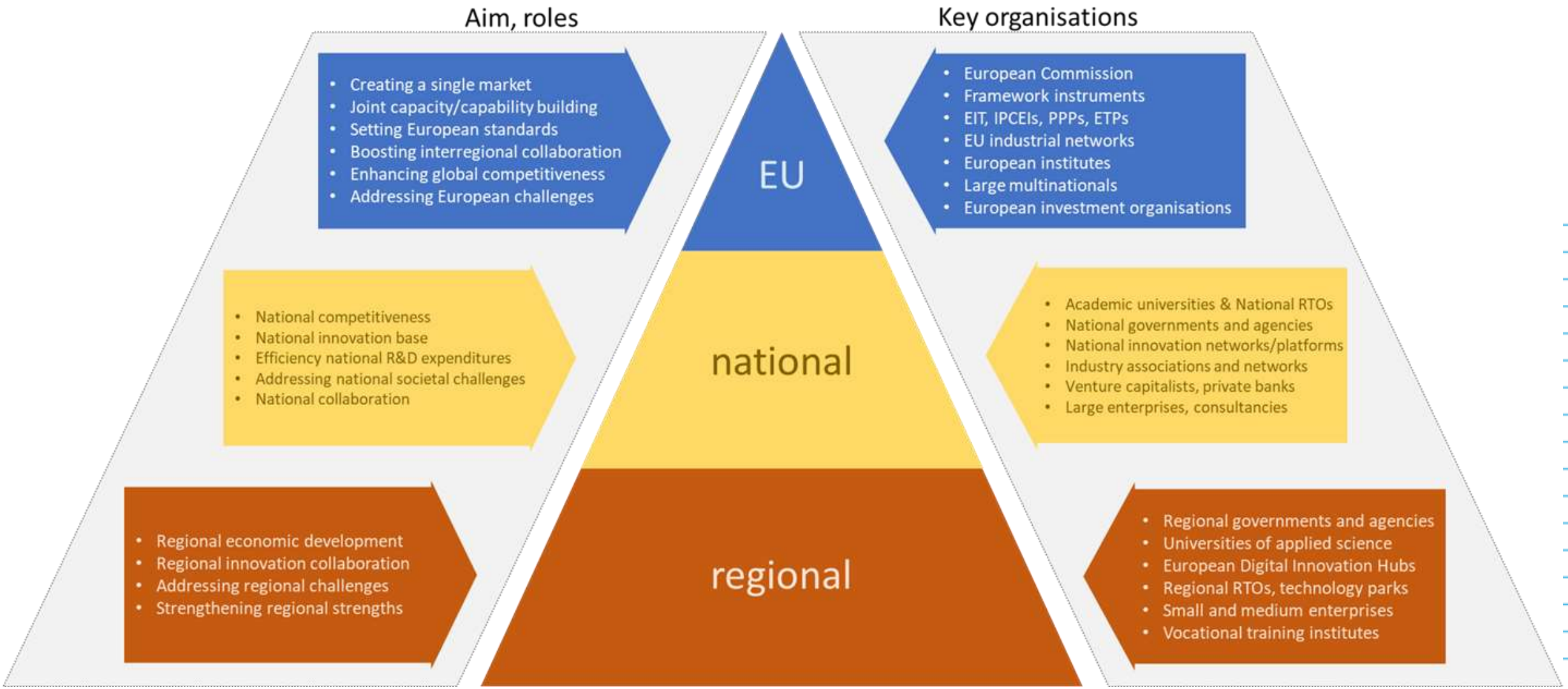
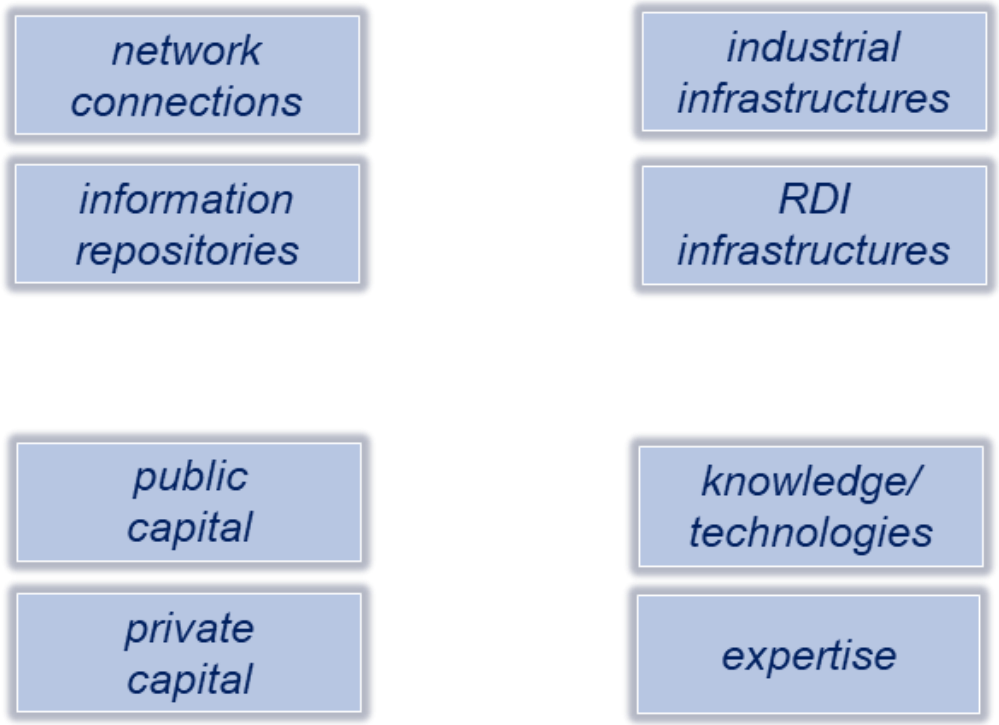

Curriculum and skills development, including certification
Educating and training of researchers
Also: supporting HR marketplace
Human resources development
Activating inter-organisational exchange
Human resources Marketplace
Innovation policy harmonization and alignment
Monitoring and evaluation of the
Core: coordination and alignment
Coordination and alignment
Activation and coordination of stakeholder engagement
Ethical, sustainable and societal assesment
Also: monitoring activities
Societal legitimization
Financing public research and development
Financing Industrial innovation
Also: facilitating access to finance
Providing innovation finance
collaboration
Innovation system functions
Innovation uptake support to companies
Also: Access to tech support
Business innovation generation
start-up and scale-up
Research and development
Establishment and maintenance of
Also: Knowledge management
Enhancing the R&D base
R&D commercialization
Consumer behavioural and early market assessments
Also: promotion of..
Market demand activation

But lets make it more complicated…..☹ ☹ ☹



Mapping: collecting information on resources and activities



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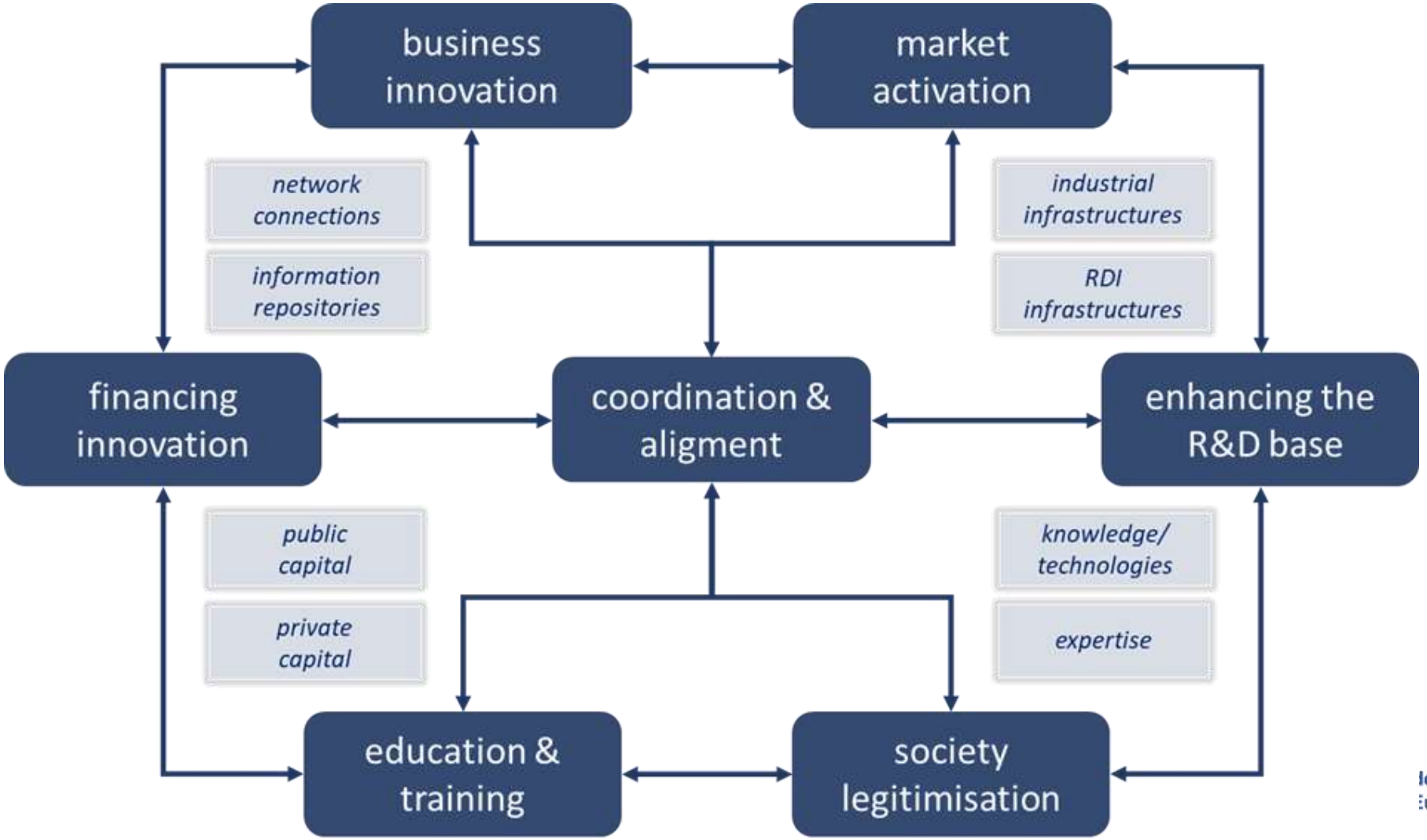
And connecting this to the innovation ecosystem functions



led by
European Union

Some preliminary outcomes of an assessment

- Limited systematic coordination
  - Both gaps and overlaps to be seen, and a lack of innovations orchestrators
- Ensuring the connection between innovation chain shackels needs support
  - The innovation relay game is not well played and therefore inefficient and ineffective
- Structural support of “enhancing the base” is needed
  - Investments in industrial and research infrastructures, but also ensuring collaboration
- Human resources needs attention
  - Both the education/training, as well as talent attraction and business retention

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Conclusions

- Better understanding of what is going on should be further addressed
- Alignment among the many initiatives needed but that requires understanding of the actors and connections – mapping!
- Mapping can serve various functions and that requires joined, structured approach
- Expansion of the mapping towards more function oriented information would help to identify policy and support EU collaboration

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Ecosystem mapping and the Adra EMIR joint topic group

Claudio Lazo

Funded by the European Union

Talking points

- Ecosystem mapping prototype
- White paper
- The EMIR joint topic group
- EMIR Roadmap

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the European Union

ai-ecosystem.aiod.eu

Introduction

What is needed for an innovative, competitive and sovereign AI-Data-Robotics ecosystem?

- Cohesion
- Collaboration
- Effectiveness

Download here

edu.nl/kjfmw

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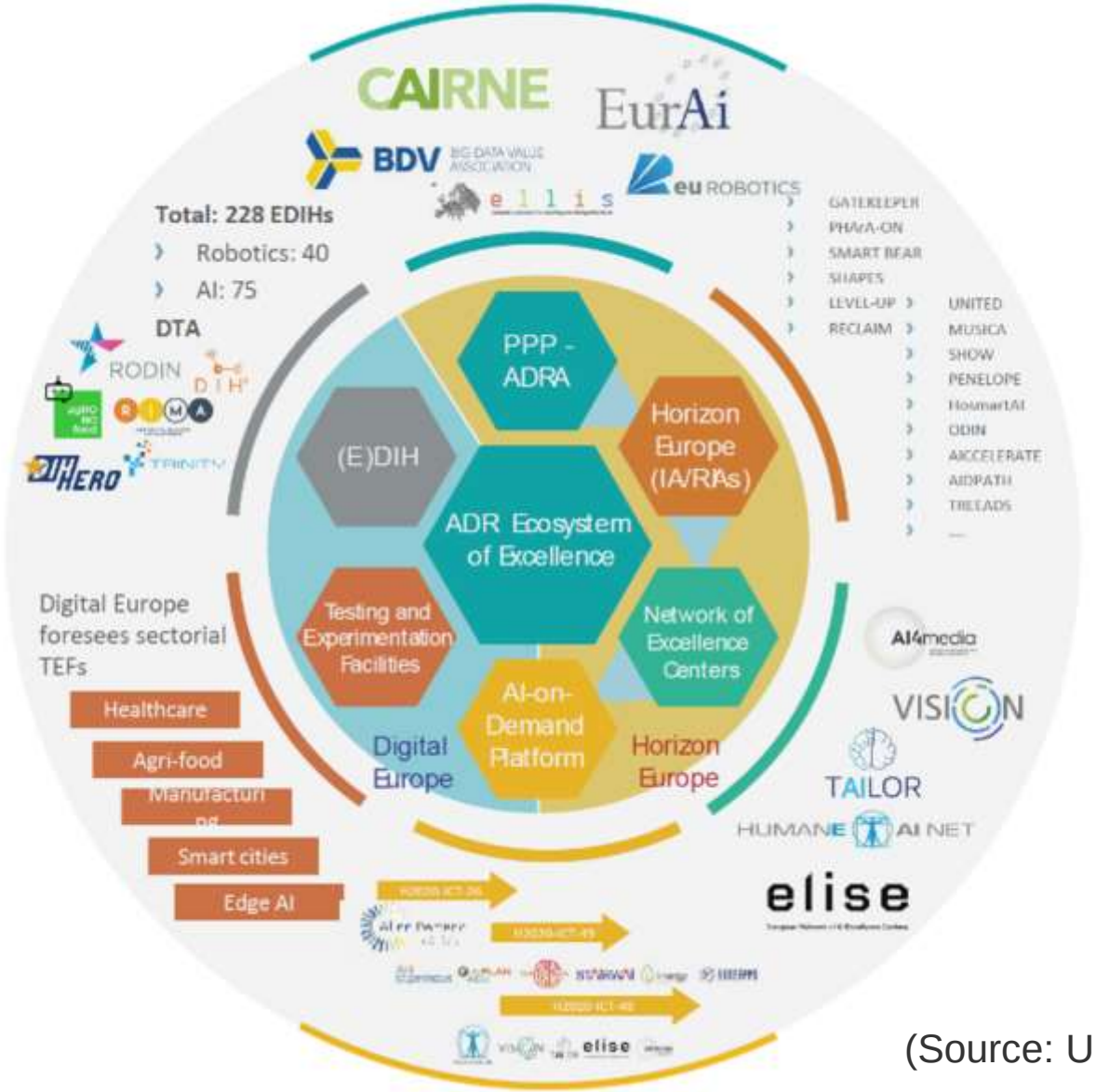
Overcoming fragmentation

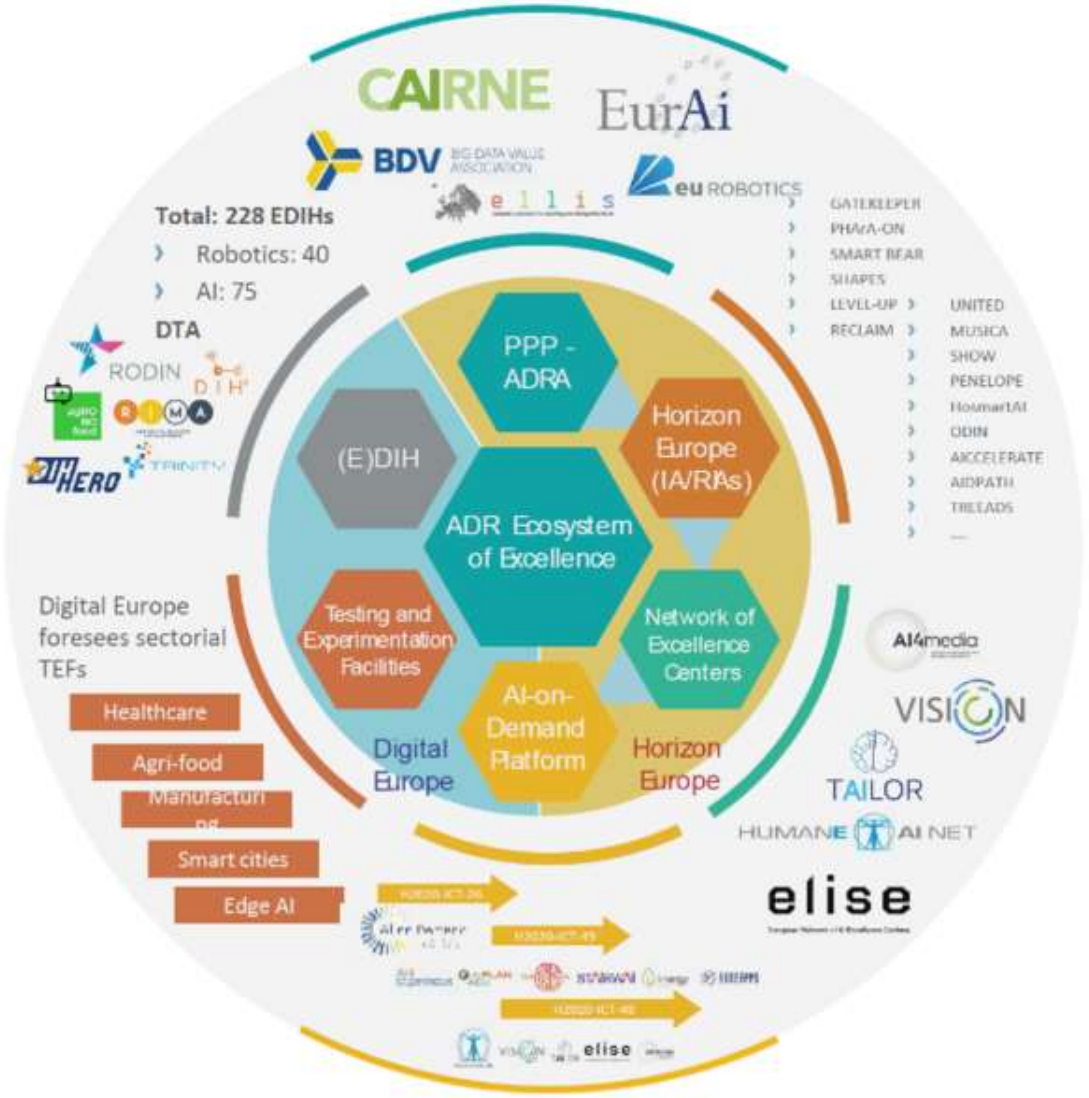


(Source: University of Twente)

Overcoming fragmentation

A ‘map’ of the ecosystem

- Different perspectives
- User-centered
- Embedding in other services
- Joint effort



(Source: University of Twente)

Vision

To help overcome fragmentation of the European ADR ecosystem…

for *the European ADR community*	***by*** *the European ADR community*	***of*** *the European ADR community*

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

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.**

TNO innovation for life

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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

Ecosystem mapping approach

- Categorization of topics and metrics
- Data collection and provision
- Data analysis and visualization
- User centricity
- Deployment and usage
- Funding and sustainability
- Governance and coordination

Download here

edu.nl/kjfmw

Types of data sources

Socio-economic data

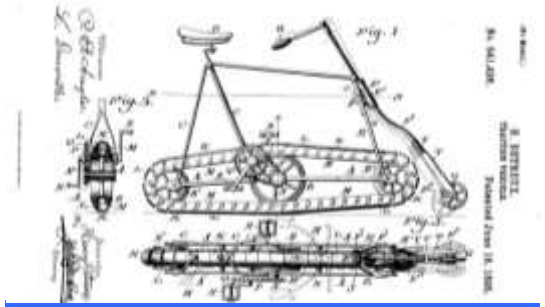
World Bank, UNESCO, OECD, JRC, Eurostat, CBS, SER

Data about society and/or economy

Academic data

Scopus, ResearchGate, arXiv, IEEE Xplore, JSTOR, ConnectedPapers

Data and metadata about research



R&D data

Horizon dashboards, Innovatiespotter, Zenodo, Patent databases

Data describing specific R&D activities, projects, and services

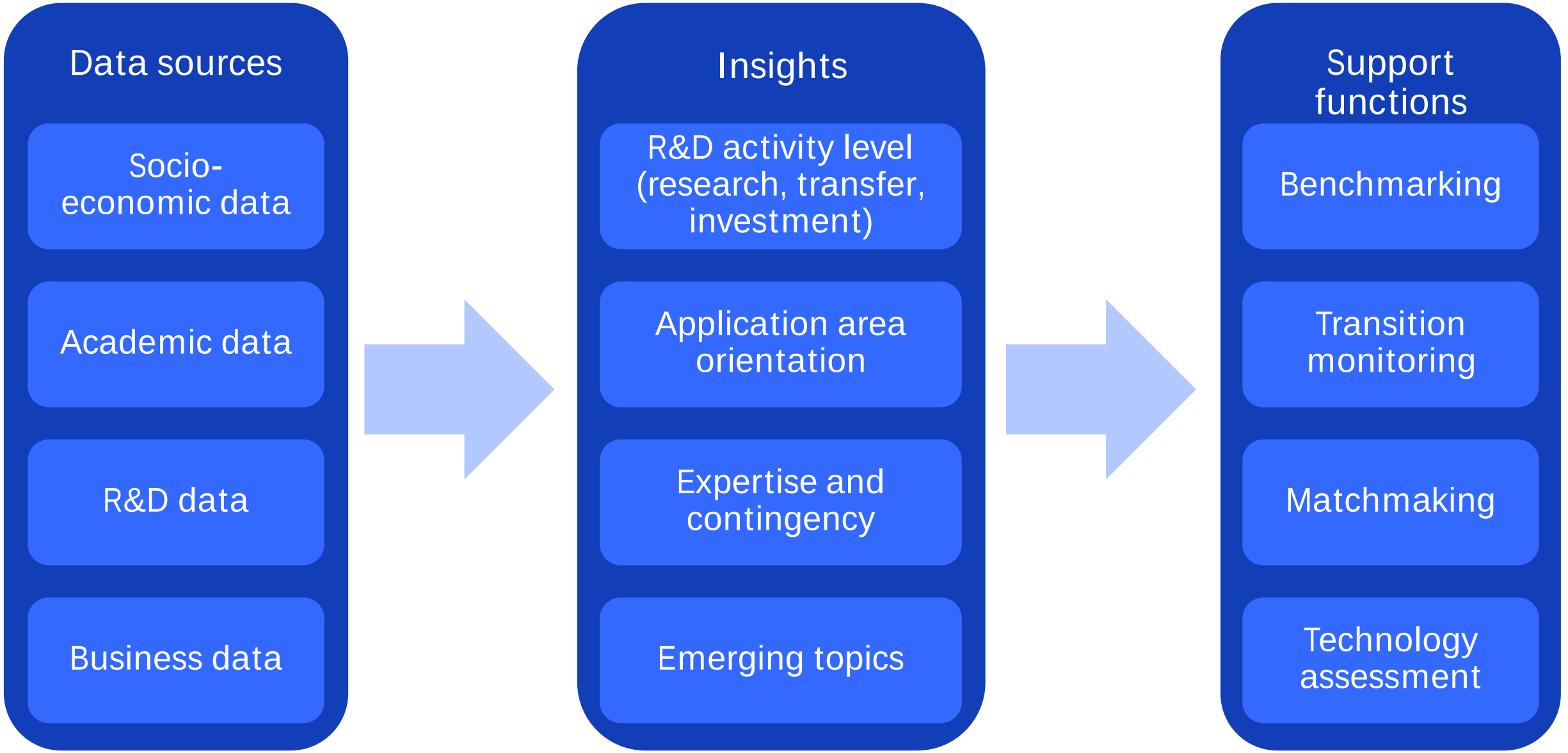
Business data

Chamber of Commerce, Dealroom, PitchBook

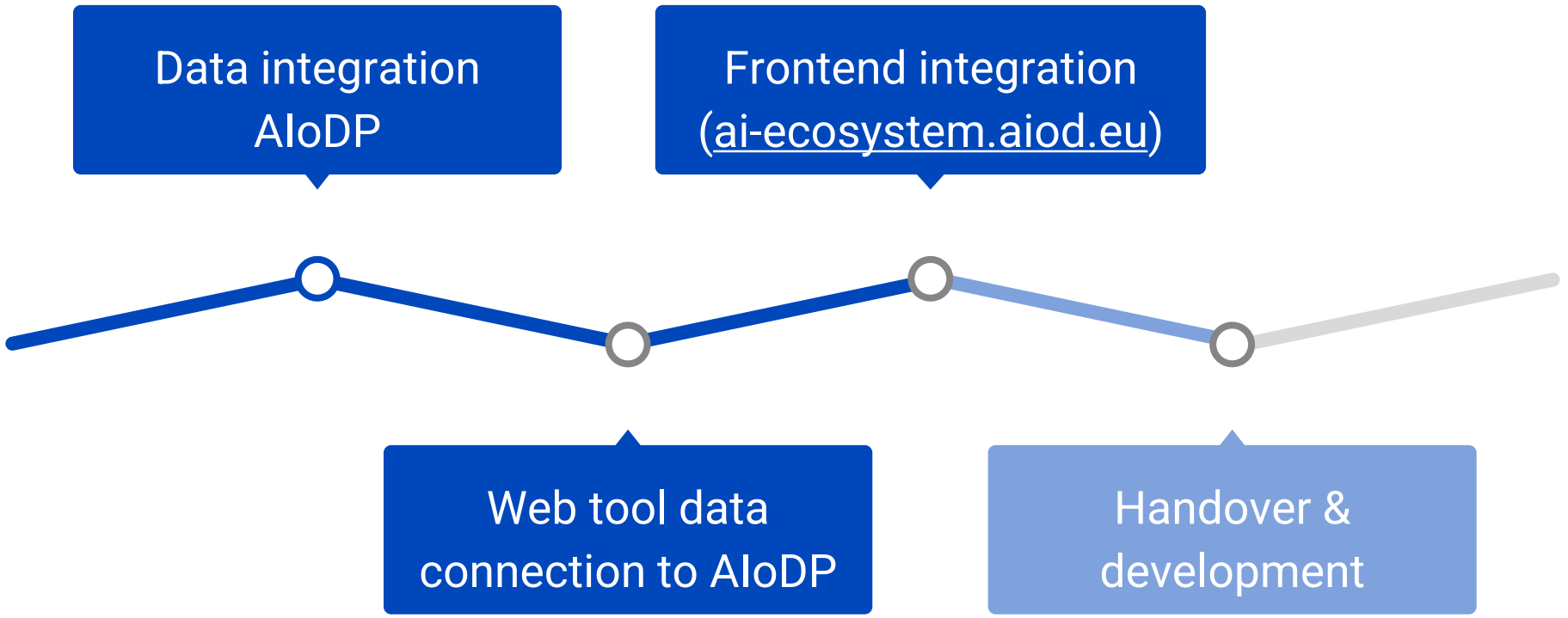
Data describing organisations, often for due diligence or investment decisions

Illustrations: Wikimedia, Springer, Picryl

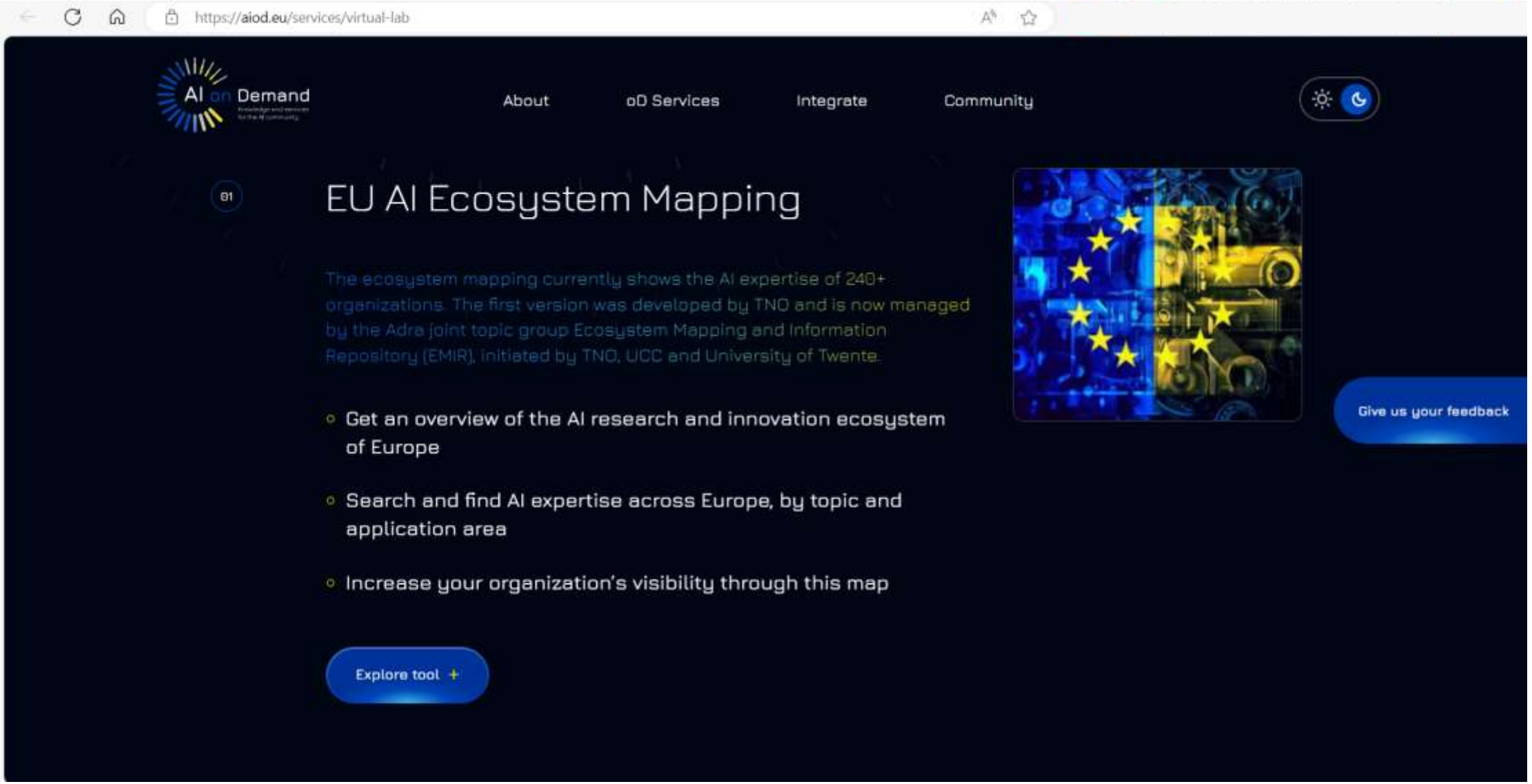
Data analysis



Roadmap for sustainability

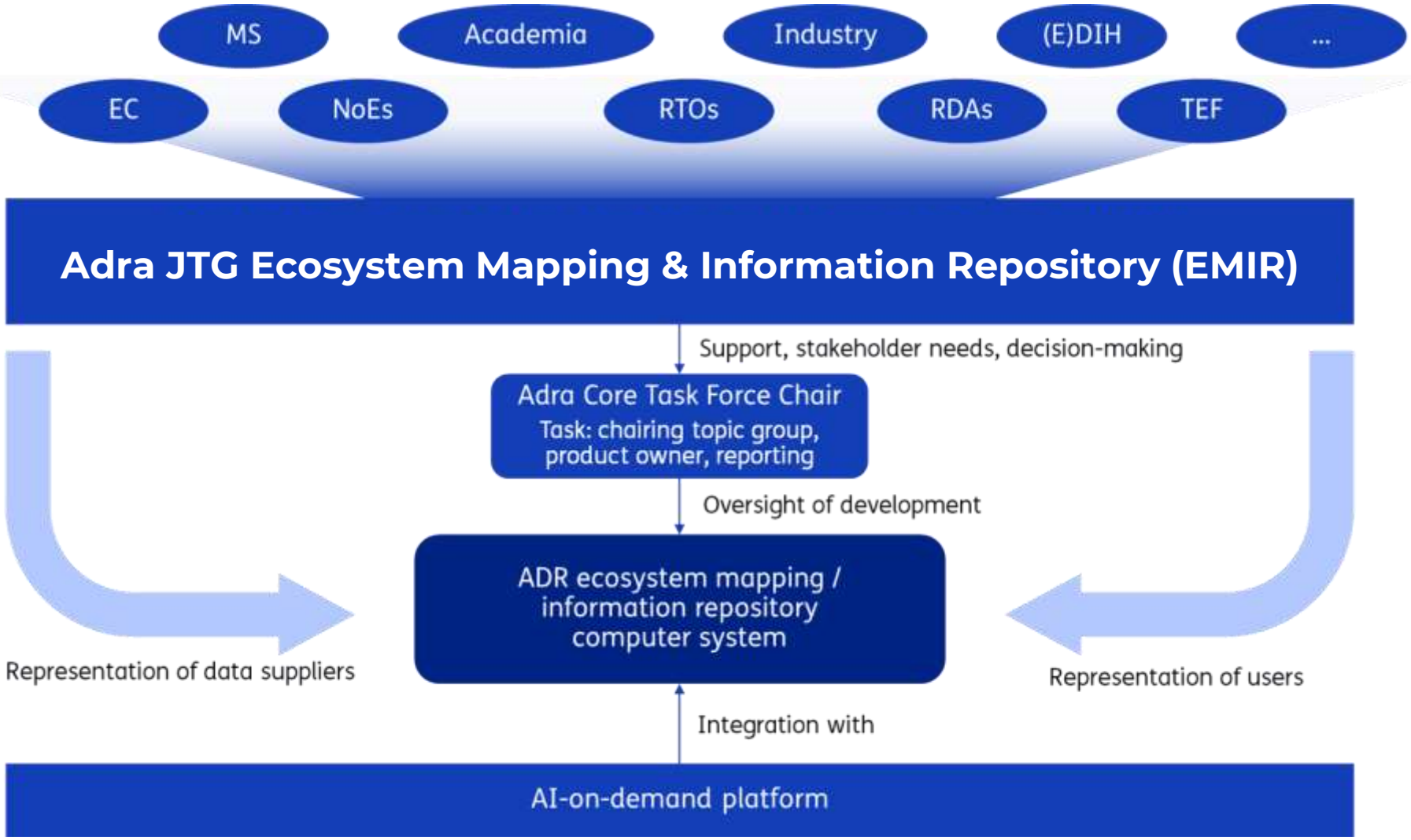


Roadmap for sustainability



JTG functions

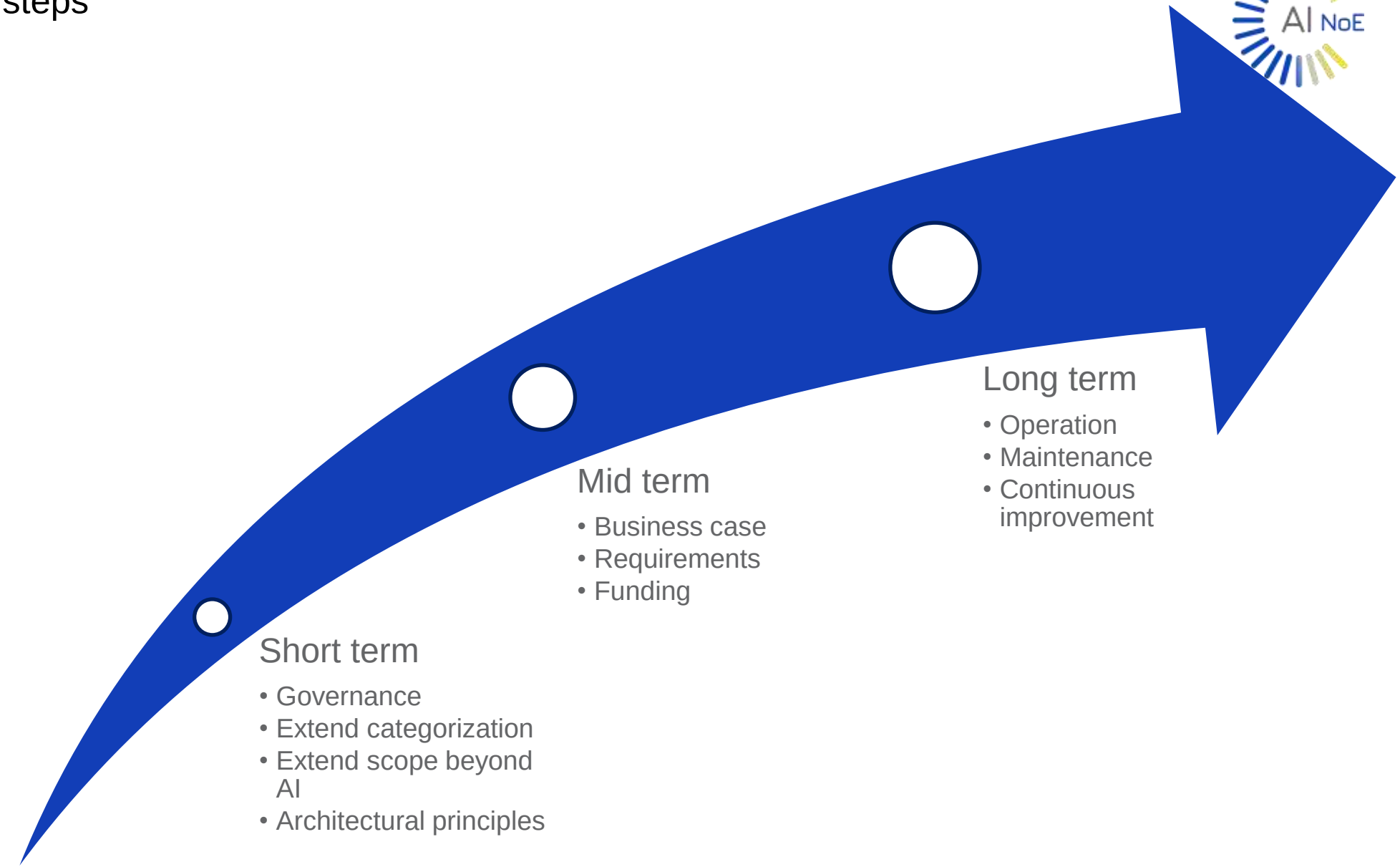
1. Democratic, diverse, and open forum
2. Growing coalition of stakeholders
3. Representation
4. Oversight



First year of the JTG

01	Governance	• Establish an organizational governance • Invite more stakeholders to join
02	Extend categorization & indicators	• Extend the categorization of research topics and application areas to the wider scope of the ADR community • Define useful ecosystem indicators and identify data sources
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) • Establish requirements for the MVP
05	Business case	• Establish a business case for the mapping • Value proposition and earning model • Funding requirements
06	Funding & development	• Organise funding • Commission and oversee the development and maintenance of the MVP

Next steps


Short term
• Governance
• Extend categorization
• Extend scope beyond AI
• Architectural principles
Mid term
• Business case
• Requirements
• Funding
Long term
• Operation
• Maintenance
• Continuous improvement

Community engagement

Mechanisms:

- EMIR mailing list (Adra)
- Adra newsletter
- Conference workshops (ADRF, ERF, EBDVF, …)
- …

Join the EMIR mailing list!

https://adr-association.eu/

Value

Research organizations

- Finding bilateral funding
- Market scan
- Matchmaking

Intermediaries

- Identify expertise
- Intelligence on areas of growth
- Supporting matchmaking

Businesses

- Success stories
- Trends for business transformation
- Positioning in AI value chain, filling a gap
- Advertising
- Finding potential business partners

Public authorities

- Judging quality of results obtained
- Quantify and visualise the EU research
- Aggregate information of NoEs

AI on Demand
Knowledge and services for the AI community

AIoD

Integration with the AIoD Platform

Long Pham, University College Cork
Mapping the EU AI ecosystem – state of play and next steps
ADRF24
Eindhoven, Netherlands
5 Nov 2024

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AI on-Demand platform

Why?

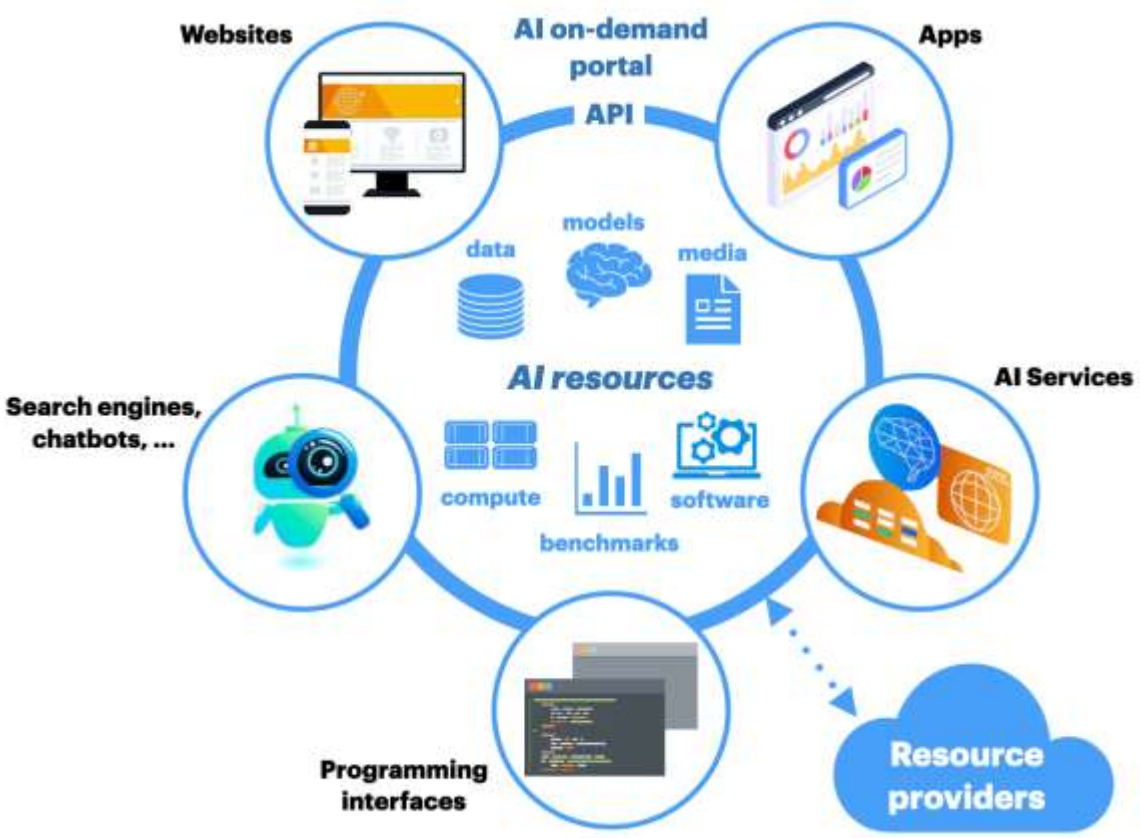
- **Bring together Europe's existing and new AI data, software, services, platforms, computational resources, and expertise**
- Support the needs of Europe's AI researchers, developers, educators and students

How?

- Easy-to-use interfaces to find AI resources
- Integrate (don't duplicate) AI services and platforms and build new ones on top of the AIoD platform

What?

- AIoD resource catalogue (distributed)
- Search engines and chatbots (in progress)
- API to exchange resources, integrate and build
- Services to perform AI tasks (e.g. experiments)

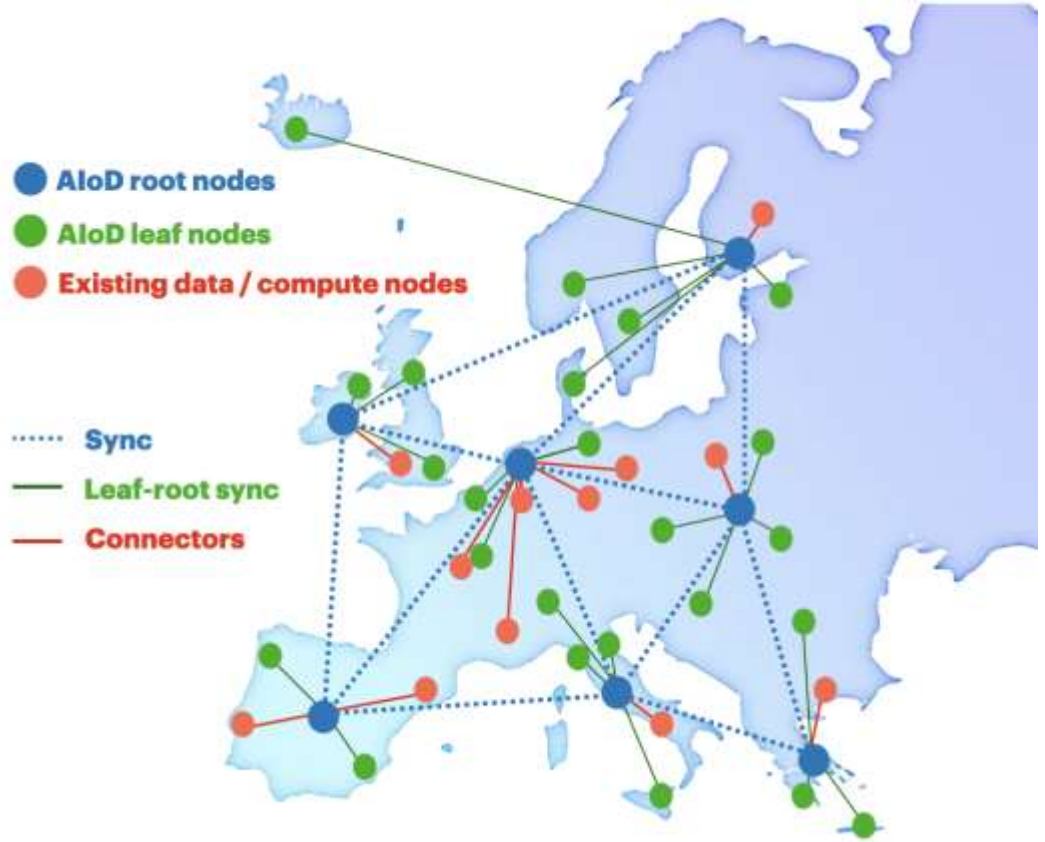


AI4EUROPE
Funded by the European Union

A decentralised AIoD platform

Distributed architecture:

- *(Root) nodes*
  - run core AIoD services (e.g. AI resource catalogue)
  - run connectors to existing data and compute infrastructure
- *Leaf nodes*
  - run thematic services built on top of the core ones (e.g., experimentation environments)
  - facilitates integration of (existing) local services and resources.
- External resources
  - provide external resources (e.g. data and compute)



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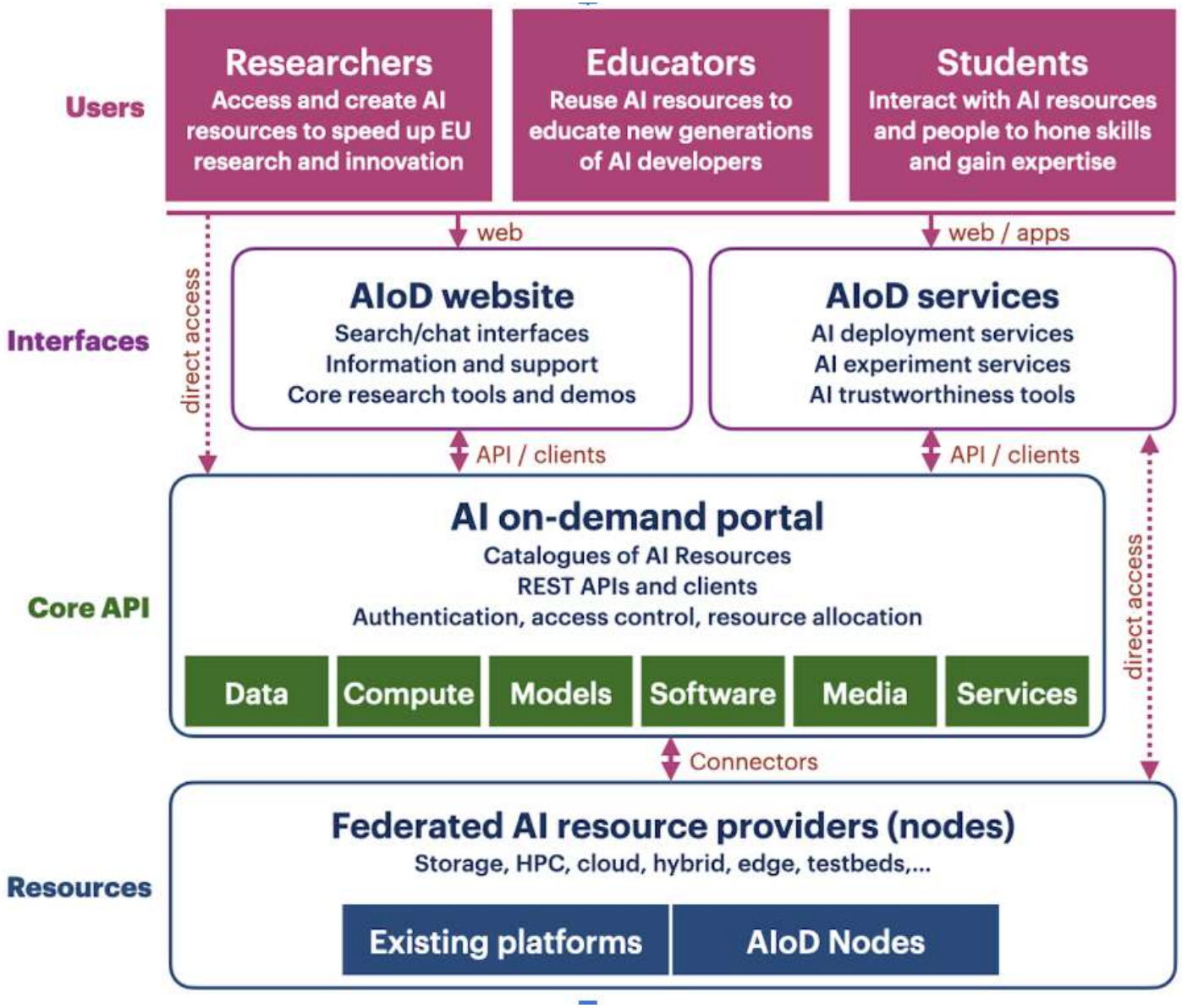
The AIoD Software Architecture (nodes)



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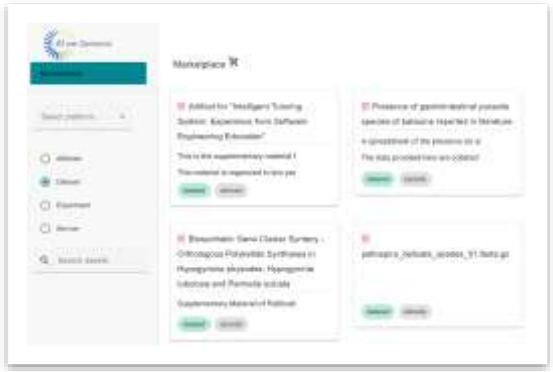
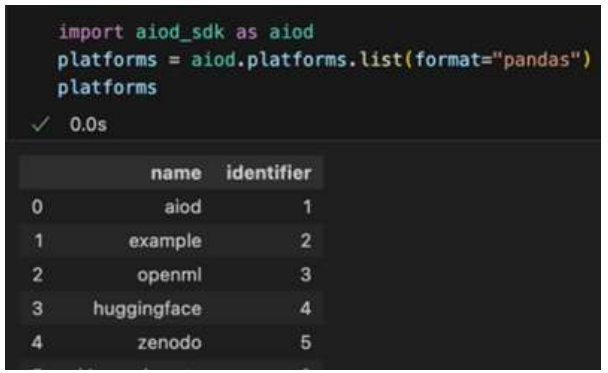
Current Interfaces

Web portal
general information

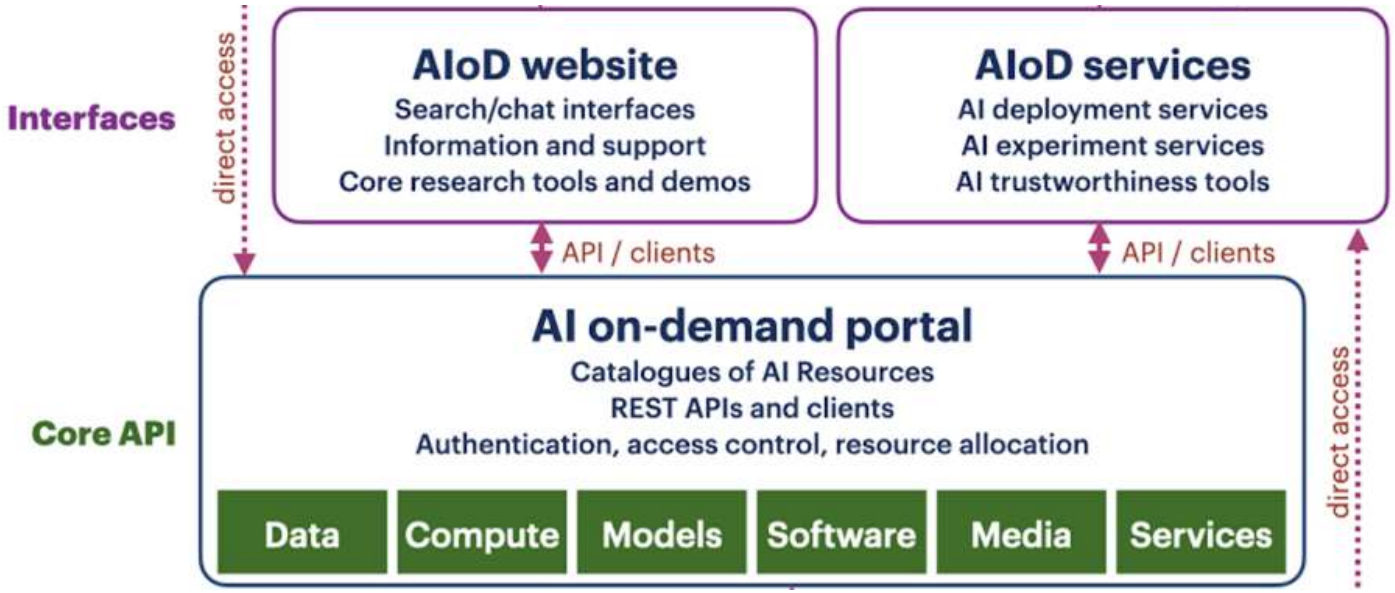


MyLibrary
search for AI resources



API
programmatic access

Services
advanced interfaces



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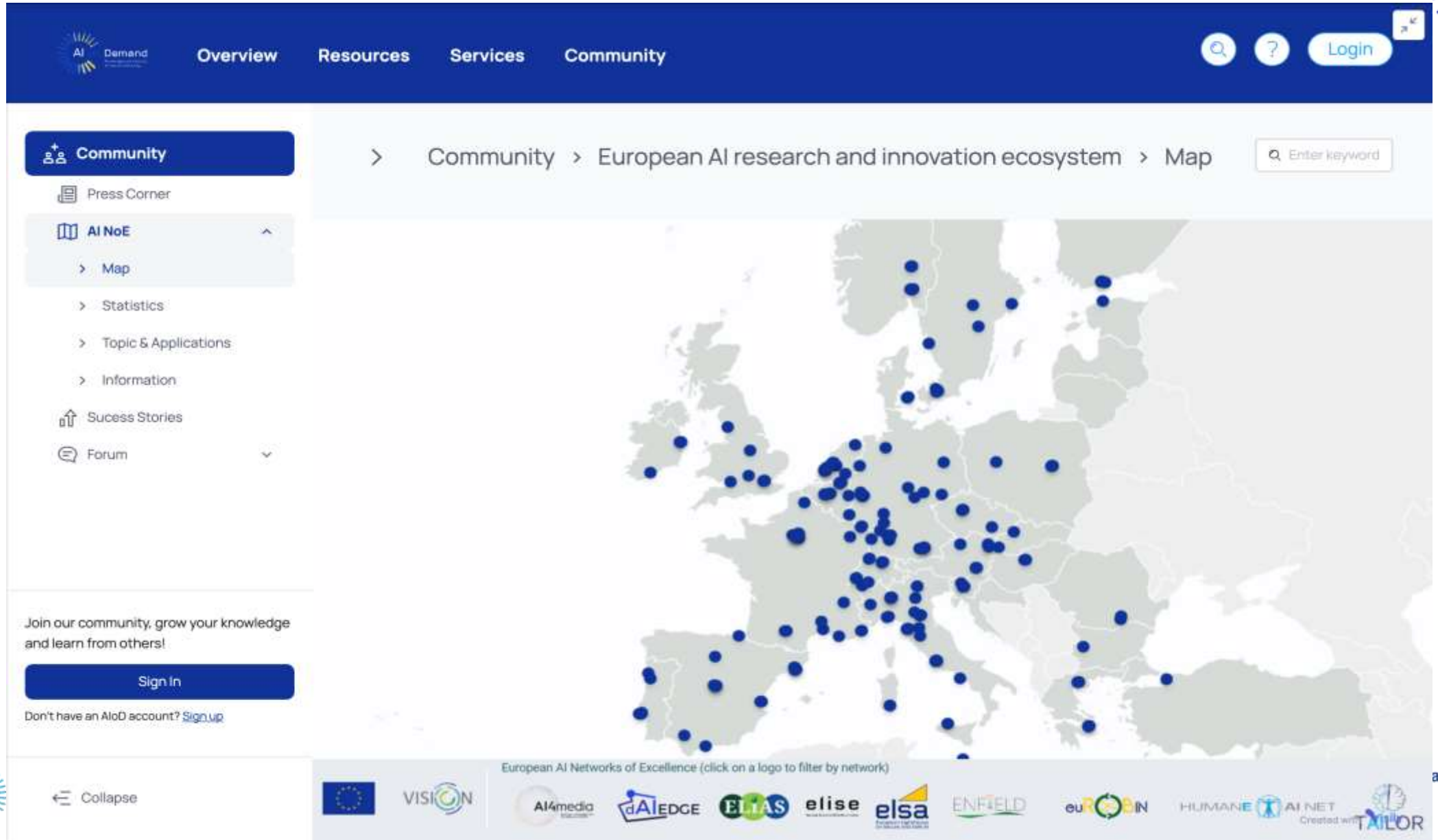
Next Release Interfaces (2025)



an Union

The AI-on-Demand Platform

A community-driven platform empowering
AI Research & Innovation

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AI on Demand

Knowledge and services for the AI community

Thank you!

www.aiod.eu info@aiod.eu @AIonDemand

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Brainstorming about the next steps

Kristina Karanikolova

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Discussion

1. Split into 4 groups (1 per corner)
2. **Group discussion**
   - 20 minutes to brainstorm and discuss with the group
   - One facilitator per group to lead and report back (Maurits, Long, Kristina, Claudio)
3. Menti to collect any thoughts you did not share or thought of later
   - move between the discussion questions on your own pace
4. Plenary sum-up and discussion from each of the facilitators
5. Interested to be further involved/informed? Add your email to Menti or join ADRA mailing list!

Join menti.com with code
3535 1513

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Questions

1. Looking at the innovation functions that are needed to ensure a collaborative European ecosystem, how can we get you to participate in providing data? – Maurits

2. How would you like to use the ecosystem tool? What services would you use? – Long

3. Which Data and Robotics topics beyond AI to integrate in the ontology? – Claudio

4. What indicators can we use: for excellence, sovereignty, competitiveness? – Kristina

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Wrap-up

Anne Bergen

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Wrap-up

Join the EMIR mailing list!

https://adr-association.eu/

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Thank you!

Anne Bergen
Long Pham
Claudio Lazo
Géraud Guilloud
Maurits Butter
Kristina Karanikolova
Freek Bomhof
Joachim de Greeff

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Appendix

Extra slides

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Introduction

Intended value

- Navigating the European R&I ecosystem
- Identifying and visualizing research excellence and impact
- Showing affiliation and more in-depth information

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.

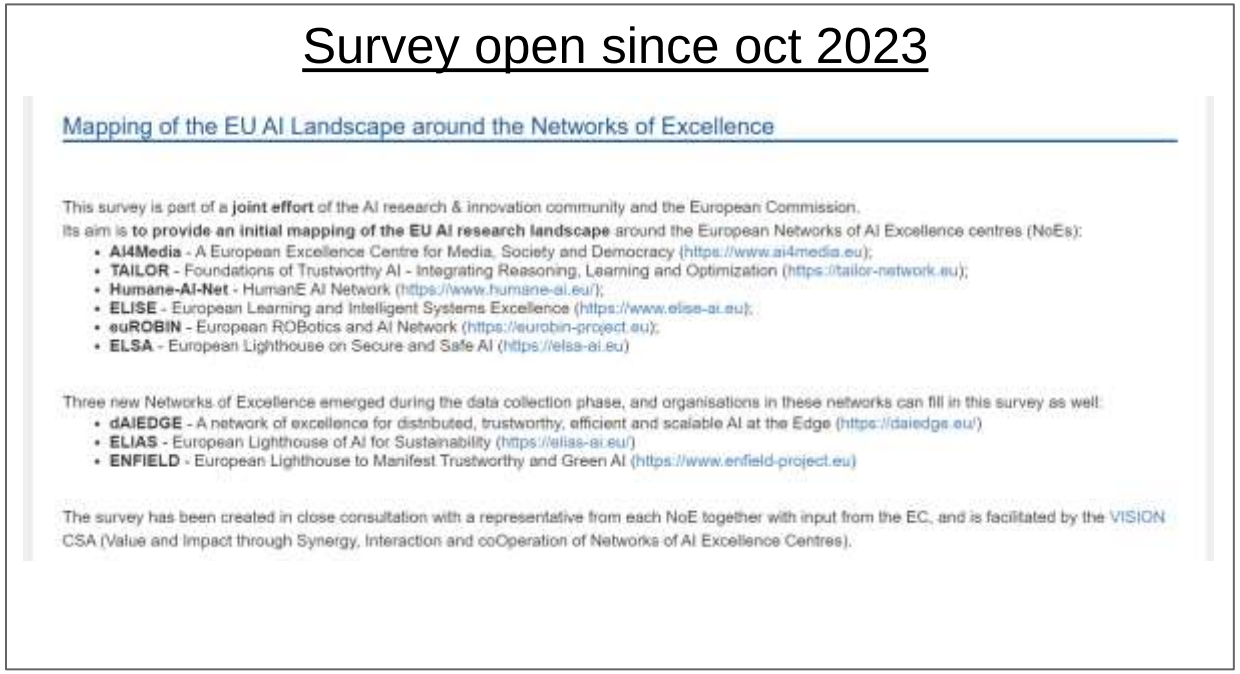
Research topics	
AI Hardware & High-Performance Computing	4
Computer Vision & Audition	36
Ethical, Legal, Social Aspects	34
Human- Machine Interaction & Cognition	32
Knowledge Representation & Management	17
Machine Learning	60
Multi-Agent Systems & Agent-Based Modelling	10
Planning, Routing & Scheduling	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):

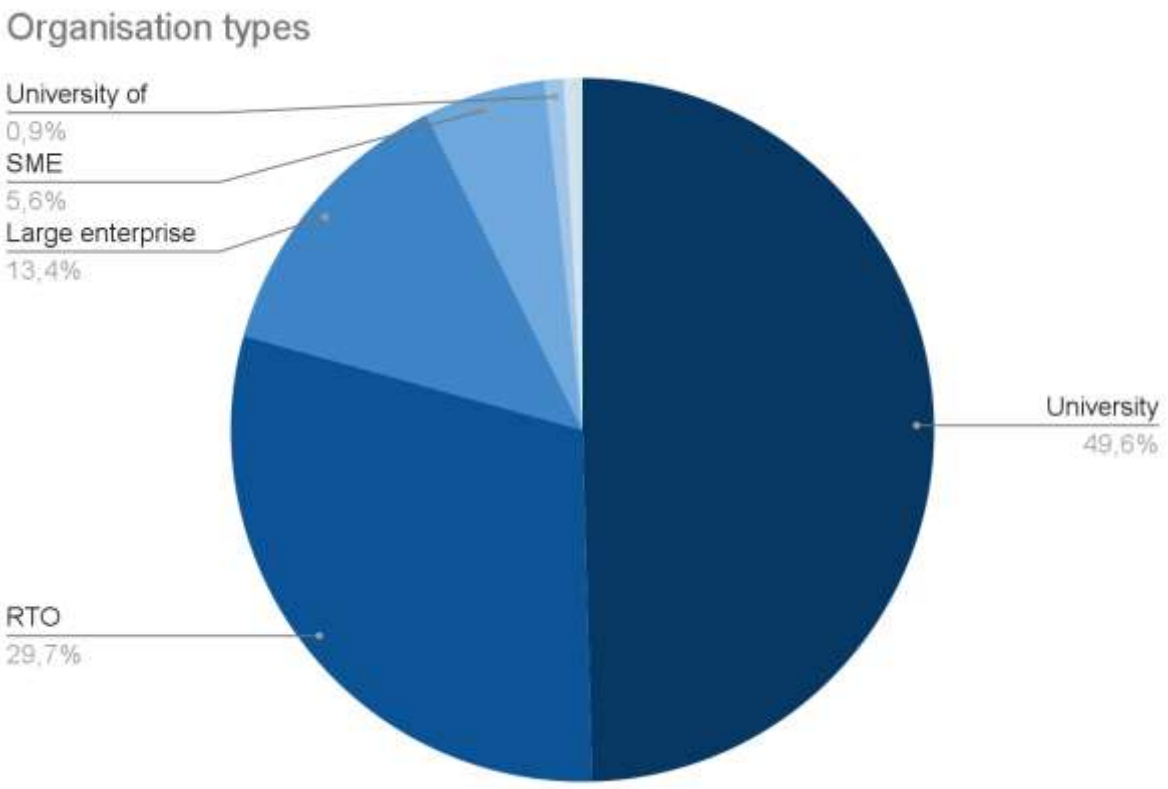
- **AI4Media** - A European Excellence Centre for Media, Society and Democracy (https://www.ai4media.eu);
- **TAILOR** - Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization (https://tailor-network.eu);
- **Humane-AI-Net** - HumanE AI Network (https://www.humane-ai.eu/);
- **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)

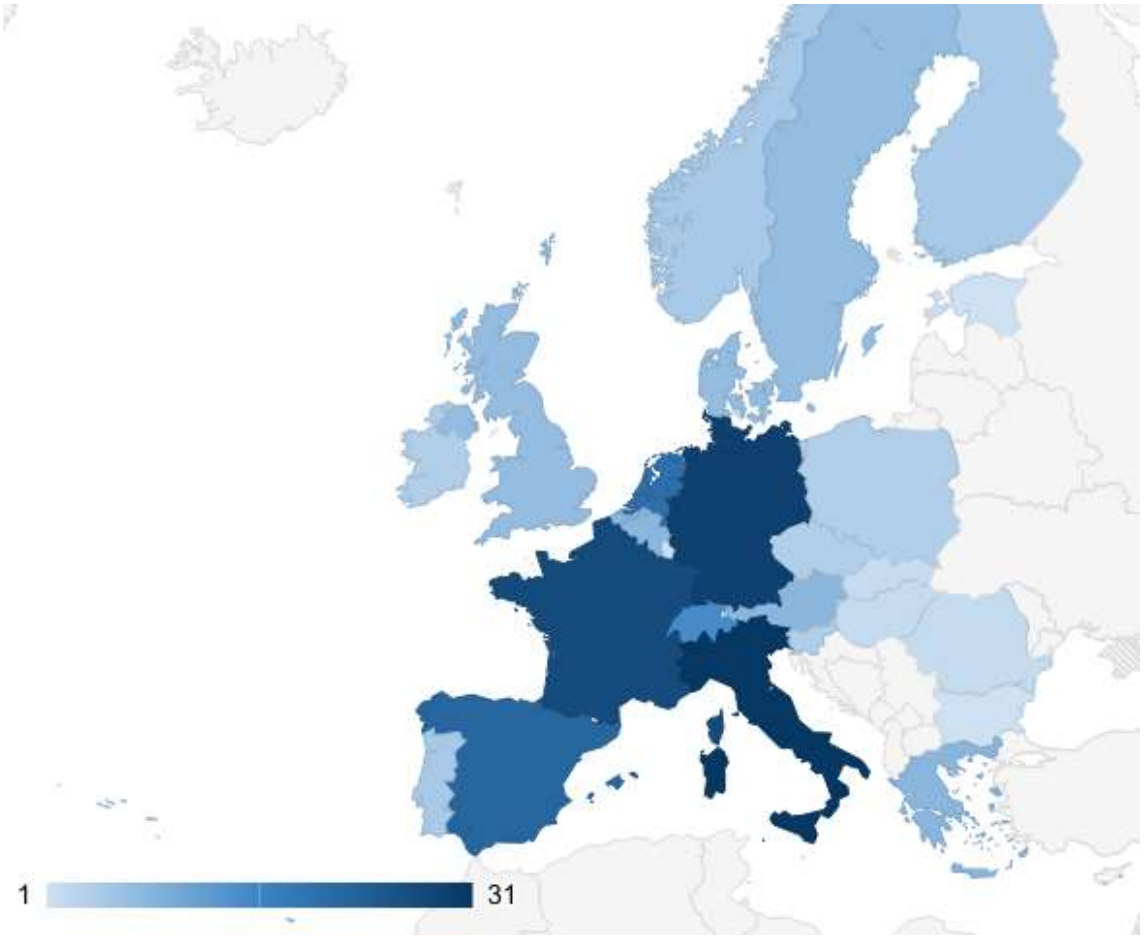
Three new Networks of Excellence emerged during the data collection phase, and organisations in these networks can fill in this survey as well:

- **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).

Data collected





Lessons

Data collection

- Hard to ask for objective data
- Dashboard & working committee made data collection efficient, but after several weeks stagnation occurs
- Much data cleaning necessary for clarity and consistency, at a risk of loss of autonomy
- Duplicate, overlapping and contradictory submissions
- **Organisation structures** vary
- **Submitting** on behalf of organisation is hard, due to limited overview and knowledge.
- **Geographical scope** broader: Incl. Turkïye, Israel
- Many orgs have **multiple locations** (e.g. HQ and research lab)

Quantity

- 9 NoEs = maybe 10% of the entire AI, Data, Robotics R&I community
- Diverse set of research topics
- Many ‘other’ topics

Features

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

Link:
https://ai-ecosystem.aiod.eu/

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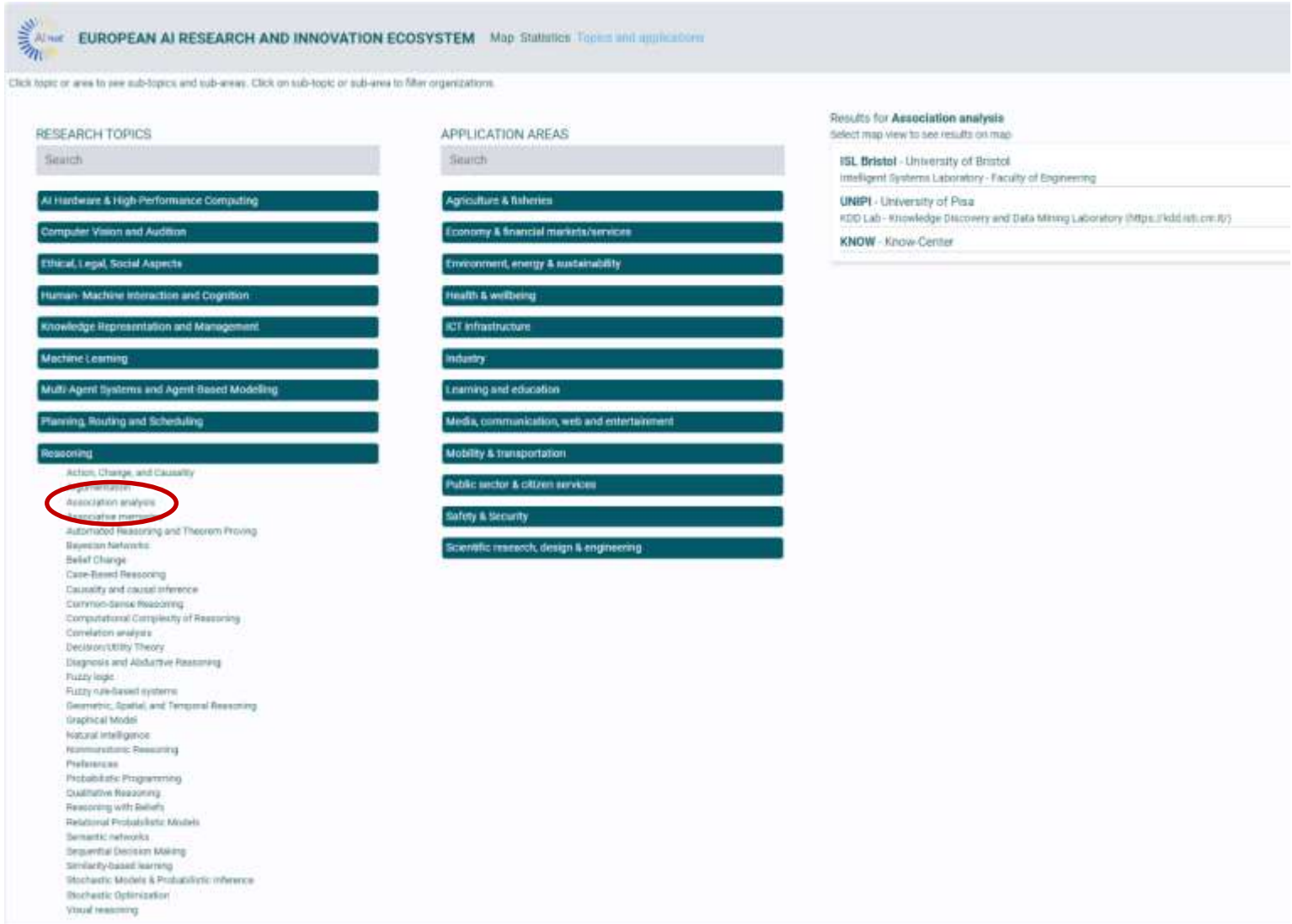
Shared language



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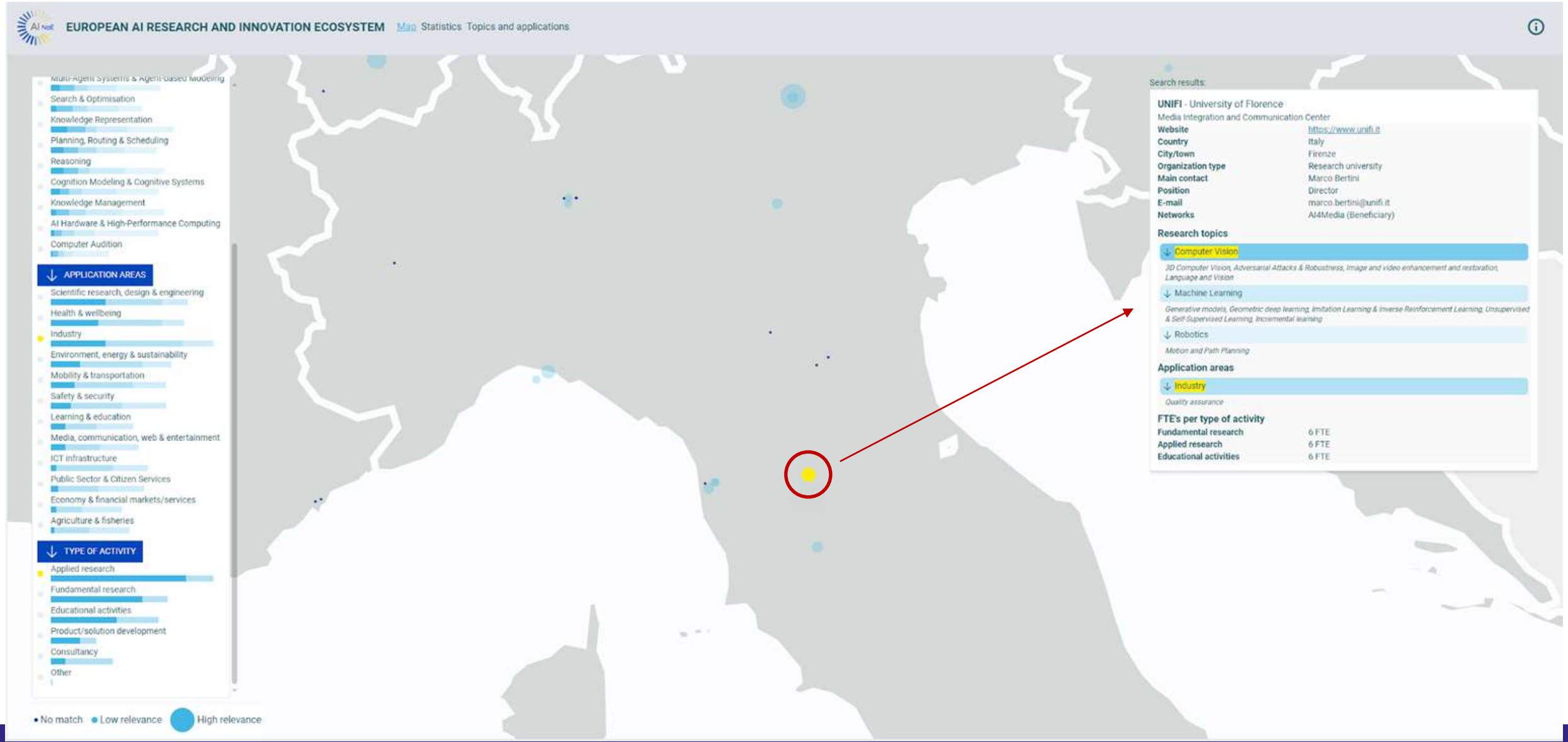
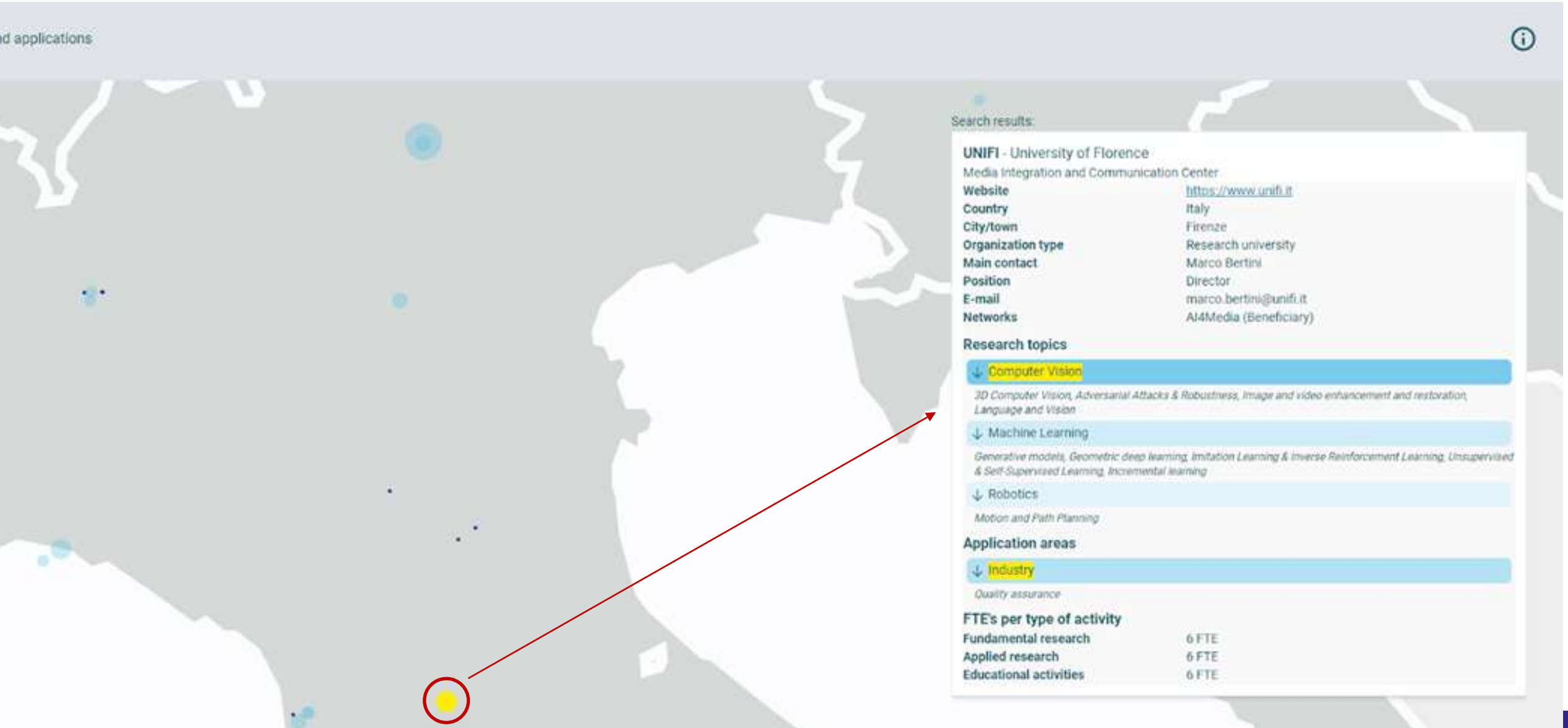
Search by topic

Detailed reporting on AI R&D orgs

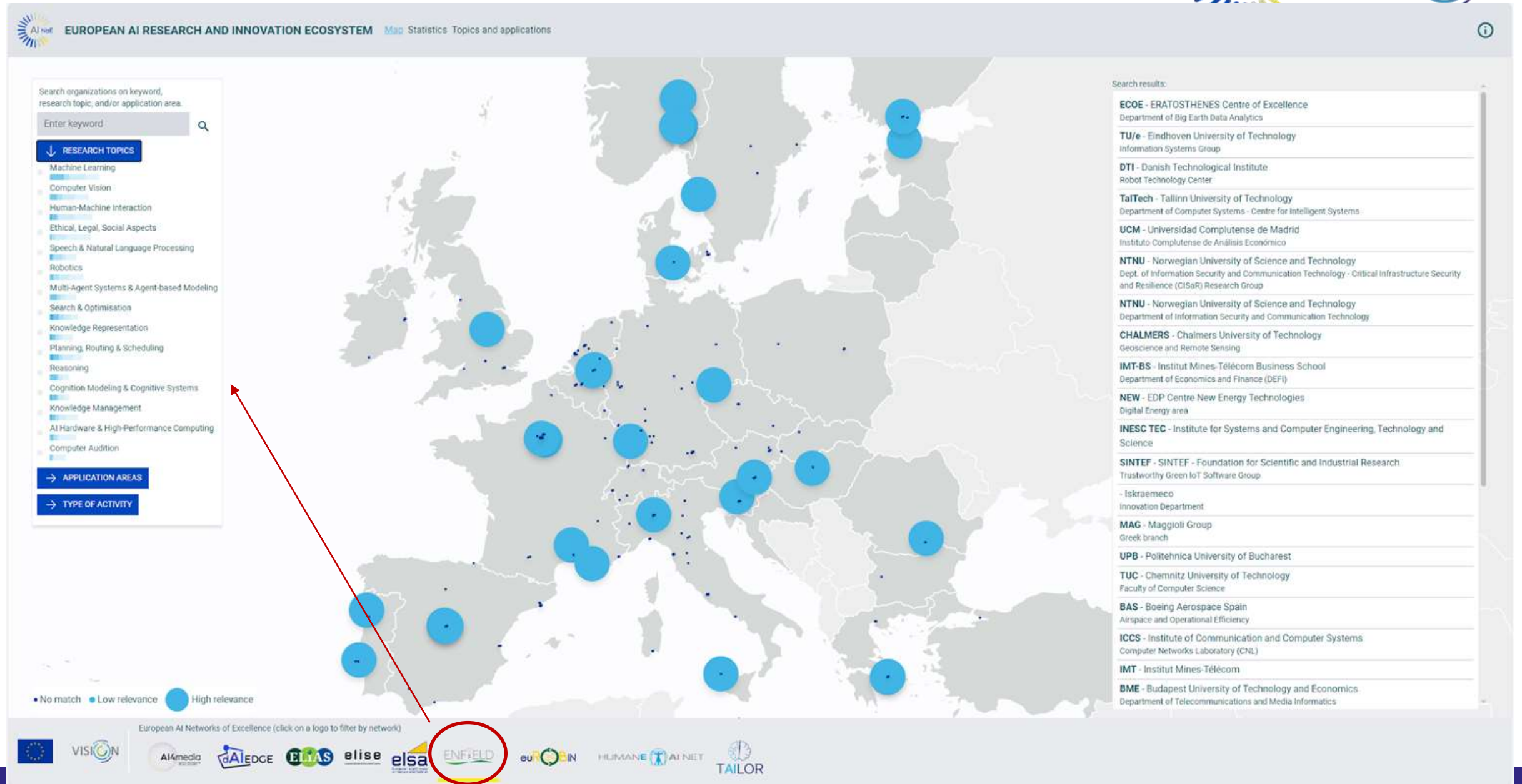


Detailed reporting on AI R&D orgs



Overview of AI R&D excellence

Overview of NoE focus



Overview of research by area

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Overview of lab-to-market per topic

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Related 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)
- Datamite AI Navigator (UCC)