ROBOTICS IN THE EUROPEAN AI STRATEGY
&
THE ROLE OF THE PPP ON AI, DATA AND ROBOTICS

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European Commission

Major Milestones Towards a European strategy for AI

2018 – A European approach to Artificial Intelligence: “AI for good and for all”

2018 – Coordinated Plan on Artificial Intelligence "Made in Europe"

2019 – Building Trust in Human Centric Artificial Intelligence

2020 – White paper on AI

Ecosystem of Excellence & Ecosystem of trust

2021 - 21 April – Regulatory framework & Coordinated plan Update

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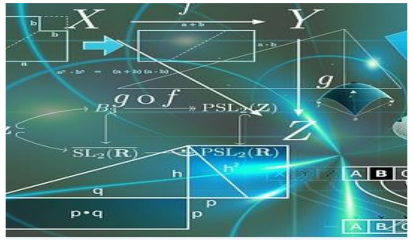
AI STRATEGY (2018)

BOOSTING THE EU'S TECHNOLOGICAL AND INDUSTRIAL CAPACITY

€1.5 billion EC investments into AI in 2018-20

BY 70% INCREASE OF ANNUAL INVESTMENT



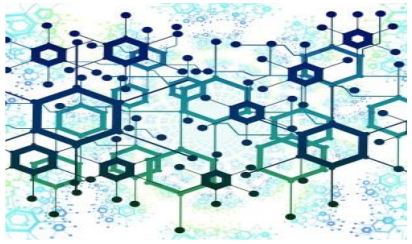
Basic and industrial research

(health, transport, agriculture, manufacturing, etc.)

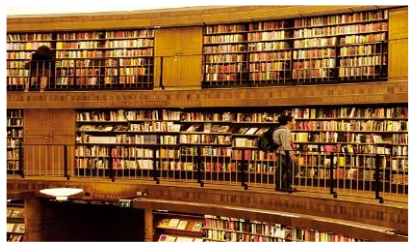
AI-on-demand platform

ICT26 + ICT 49

AI4EU

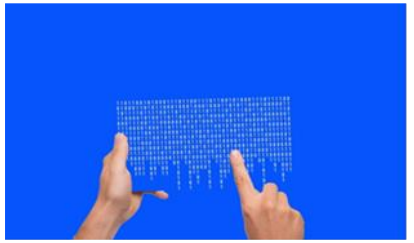


Network of AI-focused Digital Innovation Hubs (DIHs)



Strengthening and Networking AI excellence centres

ICT-48



Setting up an industrial data platform

Beyond 2020:

Increasing investments to €20 billion / year

Total Public & Private investments in Europe

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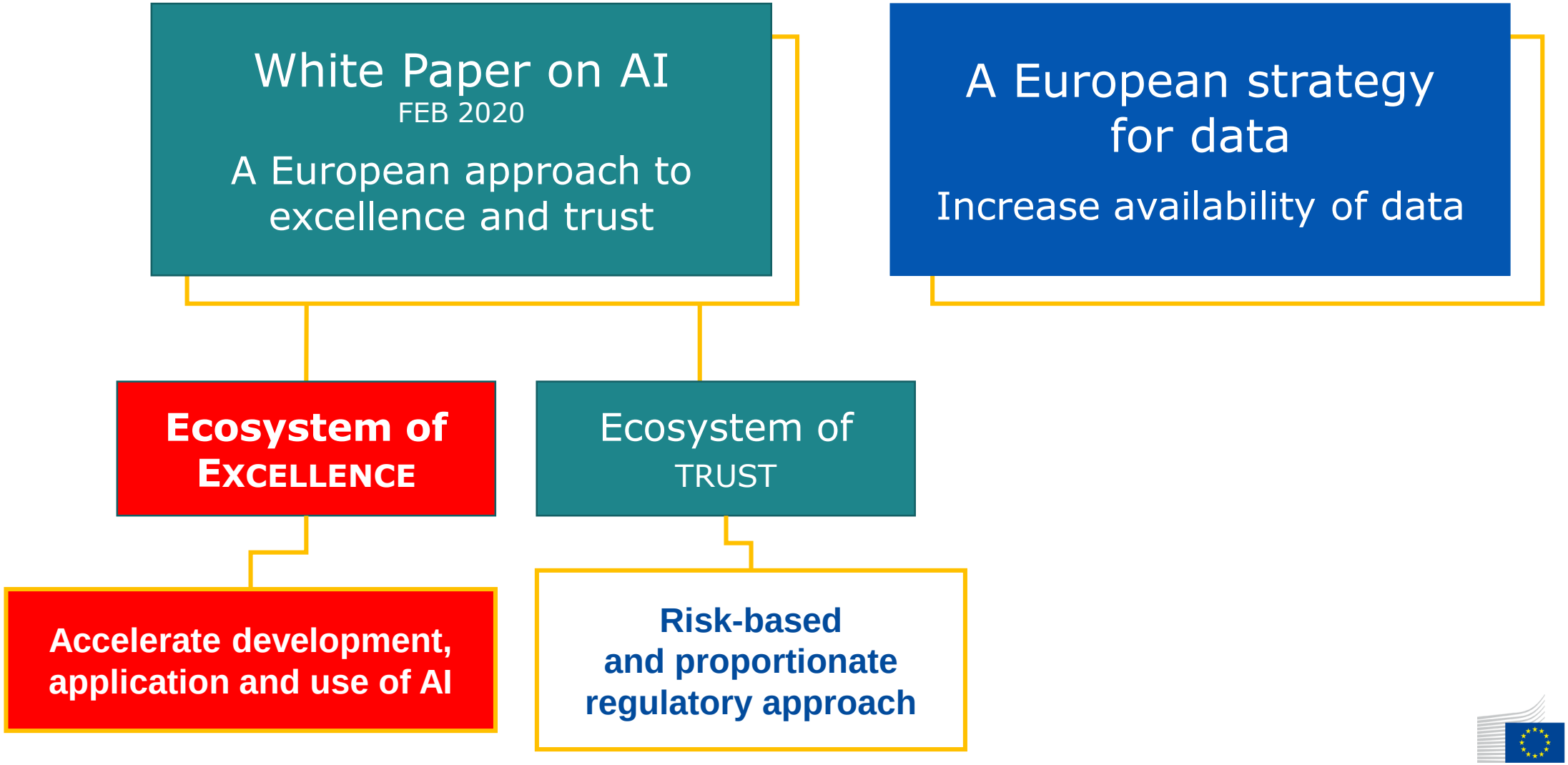
A BALANCED APPROACH TO AI
EC STRATEGIES FOR AI AND DATA



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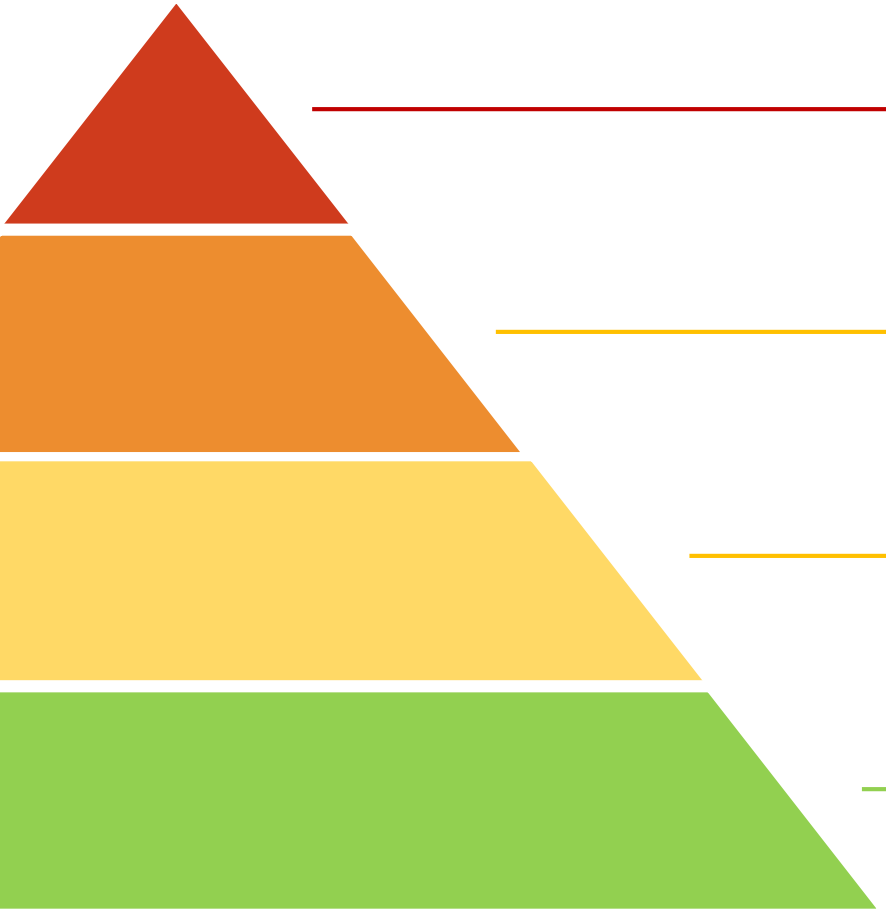
A risk-based approach to regulation



Unacceptable risk
e.g. social scoring

Prohibited

High risk
e.g. recruitment, medical devices

Permitted subject to compliance with AI requirements and ex-ante conformity assessment

AI with specific transparency obligations
'Impersonation' (bots)

Permitted but subject to information/transparency Obligations

Minimal or no risk

Permitted with no restrictions

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A risk-based approach to regulation

➔ Implications for Robotics

High risk

e.g. recruitment, medical devices

Permitted subject to compliance with AI requirements and ex-ante conformity assessment

AI systems intended to be used as safety component of products that are subject to third party ex-ante conformity assessment (e.g. machinery, toys, medical devices, etc.)

other stand-alone AI systems with mainly fundamental rights implications that are explicitly listed in Annex III.

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Requirements for high-risk AI

Establish and implement **risk management** processes

&

In light of the **intended purpose** of the AI system

- Use **high-quality** **training, validation and testing** **data** (relevant, representative etc.)
- Establish **documentation** and design logging features (traceability & auditability)
- Ensure appropriate certain degree of **transparency** and provide users with **information** (on how to use the system)
- Ensure **human oversight** (measures built into the system and/or to be implemented by users)
- Ensure **robustness**, **accuracy** and **cybersecurity**

FOUR KEY POLICY OBJECTIVES FOR ARTIFICIAL INTELLIGENCE IN EUROPE

SET ENABLING CONDITIONS FOR AI DEVELOPMENT AND UPTAKE IN THE EU

- Acquire, pool and share policy insights
- Tap into the potential of **data**
- Foster critical **computing capacity**

MAKE THE EU THE RIGHT PLACE; EXCELLENCE FROM LAB TO THE MARKET

- **Collaboration** with stakeholders, **Public-private Partnership on AI, data and robotics**
- **Research** capacities (incl. Networks of Excellence Centers)
- Testing and experimentation (**TEFs**), uptake by SMEs (**EDIHs**)
- Funding and scaling **innovative** ideas and solutions

ENSURE AI TECHNOLOGIES WORK FOR PEOPLE

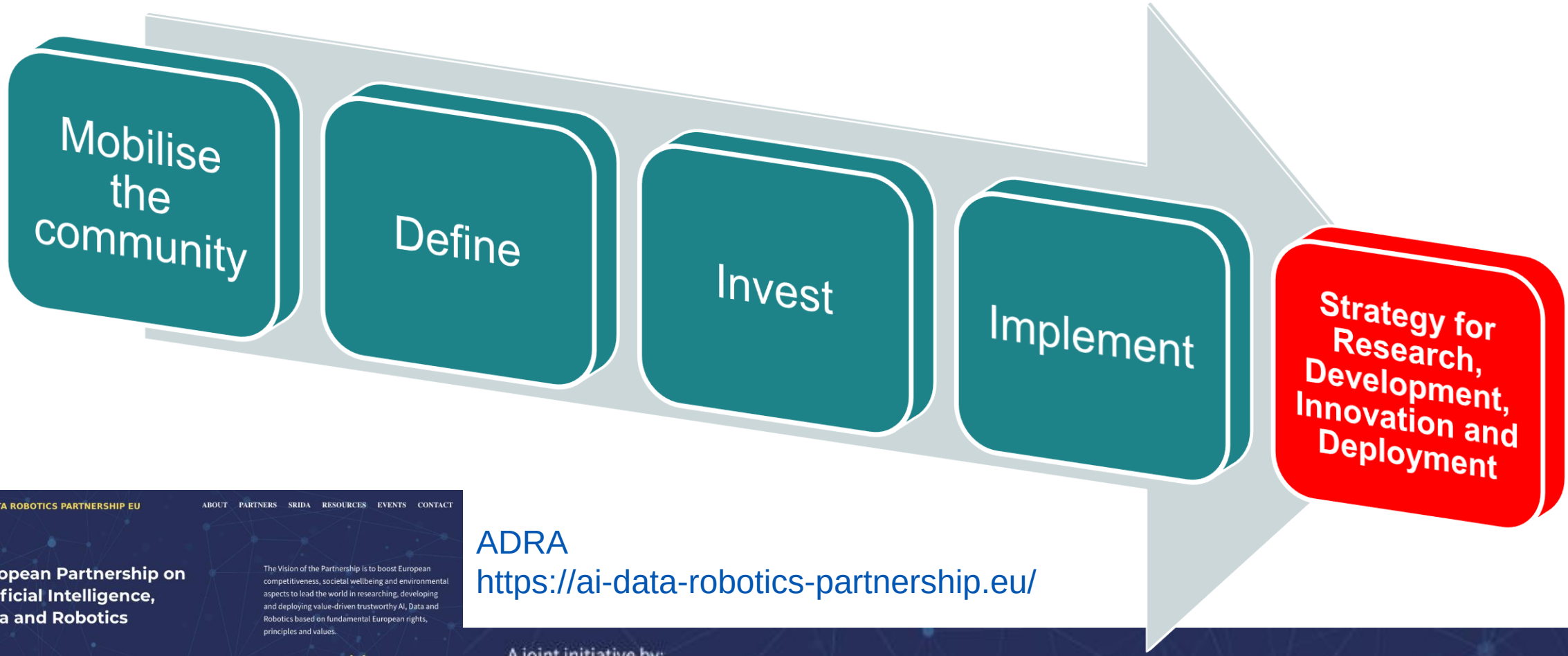
- **Talent** and **skills**
- A policy framework to ensure **trust** in AI systems
- **Promoting** the EU vision on sustainable and trustworthy AI **in the world**

BUILD STRATEGIC LEADERSHIP IN THE SECTORS

- Climate and environment
- Health
- **Strategy for Robotics in the world of AI**
- Public sector
- Law enforcement, immigration and asylum
- Mobility
- Agriculture

Investments: Horizon Europe, Digital Europe, Recovery and Resilience Facility

STRENGTHEN RESEARCH, INNOVATION AND DEPLOYMENT
PPP ON AI, DATA AND ROBOTICS



ADRA
https://ai-data-robotics-partnership.eu/

A joint initiative by:
BDV CLAIRE ellis EurAi eu ROBOTICS European Commission

STRENGTHEN RESEARCH, INNOVATION AND DEPLOYMENT
PPP ON AI, DATA AND ROBOTICS

ROBOTICISTS: BE PART OF IT!

Strategy for Research, Development, Innovation and Deployment

https://ai-data-robotics-partnership.eu/

A joint initiative by:
BDV
CLAIRE
ellis
EurAi
eu ROBOTICS
European Commission

KEY MESSAGES

- Ensure a strong Robotics participation in ADRA ➔ become a member
- Integrated and multidisciplinary approach to Smart (AI-powered) robots:
  - Partner with AI & Data to build the next generation of robots
- Don’t work in silos ➔ join forces to be stronger to reach ADRA’s Vision
- Attract the user industry ➔ provide a comprehensive offer to their problems

KEY MESSAGES

AMBITIOUS BUT REALISTIC VISION FOR AI / DATA / SMART ROBOTICS IN 10 YEARS

S&T&I CHALLENGES & BARRIERS TO ADOPTION

PRIORITIES & ROADMAP TO REACH THE VISION

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AI, Data and Robotics in the next funding programmes

R&D&I

- Research, Technological development, demonstration, piloting, proof-of-concept

CAPACITY & DEPLOYMENT

- Investing in **capacity** and **infrastructure**
  - **Data & Cloud**
  - **Testing and experimentation Facilities for AI**
  - **AI-on-Demand platform**
- Skills
- Boosting deployment:
  - **SMEs / Public sector**
  - **with help of DIHS**

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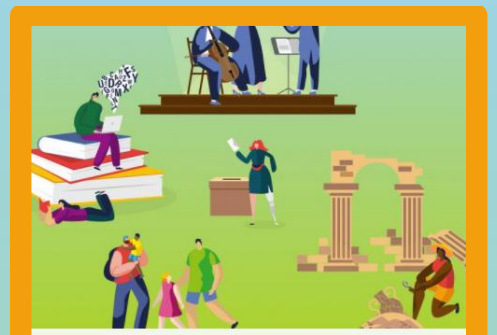
AI, Data and Robotics in the next funding programmes

Pillar 2

GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Cluster 1 - Health



Cluster 2 - Culture, Creativity & Inclusive Society

Cluster 3 - Civil Security for Society

Cluster 4 - Digital, Industry & Space

Cluster 5 - Climate, Energy & Mobility

Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture & Environment

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KEY MESSAGES

- WORK WITH OTHER PPPs
  - Complementarities
  - Synergies
- PPP addressing other technologies
- PPP centered on Applications

CLUSTER 1: Health	CLUSTER 4: Digital, Industry & Space	CLUSTER 5: Climate, Energy & Mobility	CLUSTER 6: Food, Bioeconomy, Agriculture,...
Innovative Health Initiative	Key Digital Technologies	Clean Hydrogen	Circular Bio-based Europe
Global Health Partnership	Smart Networks & Services	Clean Aviation	Rescuing Biodiversity to Safeguard Life on Earth
Transforming Health Care Systems	High Performance Computing	Single European Sky ATM Research 3	Climate Neutral, Sustainable and Productive Blue Economy
Risk Assessment of Chemicals	European Metrology (Art. 185 of the TFEU)	Europe's Rail	Water4All "Water security for the planet"
ERA for Health	Artificial Intelligence, Data and Robotics	Cooperative, Connected and Automated Mobility (CCAM)	Animal Health and Welfare*
Rare Diseases*	Photonics	Batteries "Towards a competitive European industrial battery value chain"	Agroecology "Accelerating Farming Systems Transition"*
One Health / Antimicrobial Resistance*	Made in Europe	Zero-emission Waterborne Transport	Agriculture of Data*
Personalised Medicine*	Clean Steel - Low Carbon Steelmaking	Zero-emission Road Transport (2ZERO)	Safe and Sustainable Food Systems*
Pandemic Preparedness* *Co-funded or co-programmed*	Processes4Planet	People-centric Sustainable Built Environment (Built4People)	
	Globally Competitive Space Systems**	Clean Energy Transition	
		Driving Urban Transitions to a Sustainable Future	

Institutionalised Partnerships (Art 185 or 187 of the TFEU)

Co-Programmed

Co-Funded

* Calls with opening dates in 2023-24

** Calls with opening dates not before 2022

DESTINATION 4
DIGITAL AND EMERGING TECHNOLOGIES FOR COMPETITIVENESS AND FIT FOR THE GREEN DEAL

Innovation in AI, Data and Robotics

DIGITAL-EMERGING-01-09: AI, Data and Robotics for the Green Deal **(IA)**
DIGITAL-EMERGING-01-10: AI, Data and Robotics at work **(IA)**

Tomorrow's deployable Robots: efficient, robust, safe, adaptive and trusted

DIGITAL-EMERGING-01-11: Pushing the limit of robotics cognition **(RIA)**
DIGITAL-EMERGING-01-12: European Network of Excellence Centres in Robotics **(RIA)**

DESTINATION 6
A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL **TECHNOLOGIES**

Leadership in AI based on trust

HUMAN-01-01: Verifiable robustness, energy efficiency and transparency for Trustworthy AI: Scientific excellence boosting industrial competitiveness **(RIA)**
HUMAN-01-02: European coordination, awareness, standardisation & adoption of trustworthy European AI, Data and Robotics **(CSA)**
HUMAN-01-03: European Network of AI Excellence Centres: Pillars of the European AI lighthouse **(RIA)**
HUMAN-01-24: Tackling gender, race and other biases in AI **(RIA)**
HUMAN-01-27: AI to fight disinformation **(RIA)**

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AI, Data and Robotics for the Green Deal

Expected outcomes:

1. Resource optimisation and minimisation of waste, energy, or greenhouse gas emissions
2. Environmental and waste management in the circular economy
3. Robotics solutions in harsh environments serving the Green Deal

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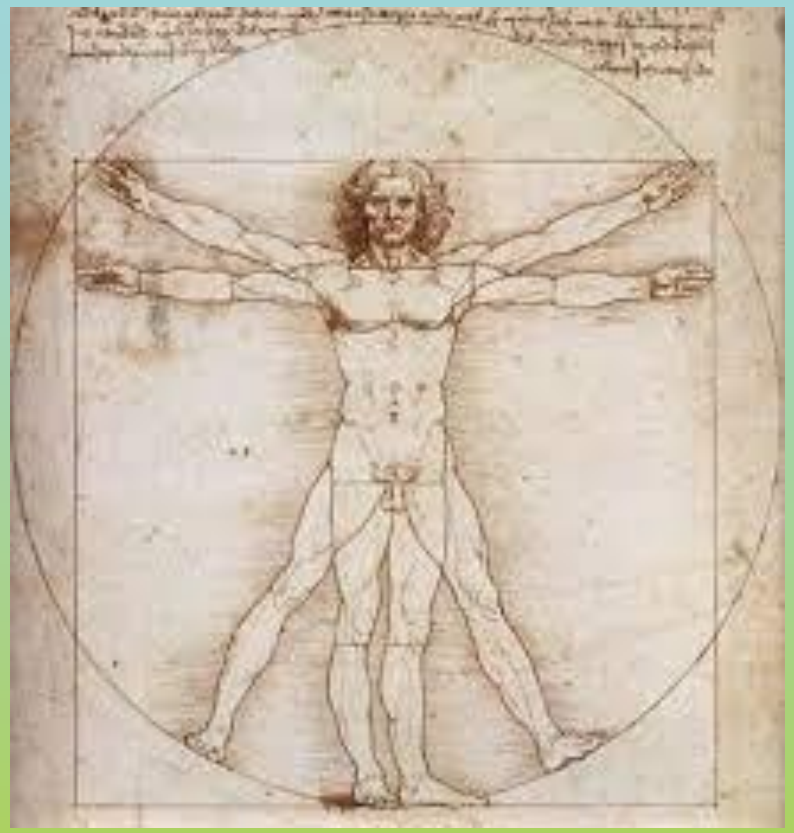
AI, Data and Robotics at work
Expected outcomes:

1. **Collaborative embodied (physical) AI:** New human-centred paradigm to keep people away from unsafe and unhealthy jobs via

2. **Human-centric AI supporting professionals** in trustworthy **hybrid decision-making**, and optimizing their tasks



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Pushing the limit of robotics cognition
Expected outcome

Improved Perception & understanding

Increased autonomy

Less supervision

Next generation of Interactive robots

- Smooth and trustworthy, safe & reliable
  - Advanced reactivity
  - Mutual understanding
  - Human-centric adaptation

New generation of AI-Powered Robotics

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SCOPE

Best scientists from academia and industry join forces

Major challenges hampering robotics deployment

Reinforce excellence throughout Europe

Network of collaboration

Research excellence

Future industrial needs.

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EXPECTED OUTCOMES

S&T advances

- major robotics challenges hampering deployment

Strong and tightly networked European research community in robotics

World-class powerhouse for robotics Excellence

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Leadership in AI based on trust

HORIZON-CL4-2021-HUMAN-01-01

- Verifiable robustness, energy efficiency and transparency for Trustworthy AI: Scientific excellence boosting industrial competitiveness (AI, Data and Robotics Partnership) (RIA)

HORIZON-CL4-2021-HUMAN-01-02

- European coordination, awareness, standardisation & adoption of trustworthy European AI, Data and Robotics (AI, Data and Robotics Partnership) (CSA)

HORIZON-CL4-2021-HUMAN-01-03

- European Network of AI Excellence Centres: Pillars of the European AI lighthouse (RIA)

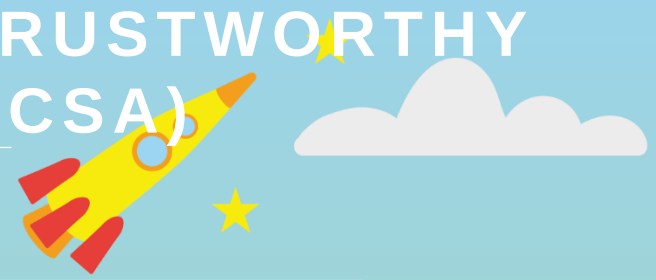
HORIZON-CL4-2021-HUMAN-01-24 (Watch Infoday June 29)

- Tackling gender, race and other biases in AI (RIA)

HORIZON-CL4-2021-HUMAN-01-27 (Watch Infoday June 29)

- AI to fight disinformation (RIA)

EUROPEAN COORDINATION, AWARENESS, STANDARDISATION & ADOPTION OF TRUSTWORTHY EUROPEAN AI, DATA AND ROBOTICS (CSA)



Outcome 1

- PPP
  - Coordination / Networking
  - Adoption of AI in all Member States and Associated Countries
  - Widespread education and outreach
  - Procurement for AI adoption
  - Standardisation to boost industry

Outcome 2

- AI-on-demand-platform serving the research community

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FOR ALL TOPICS PRESENTED

PROJECT REQUESTED TO

➔ DEDICATE A TASK TO CONNECT TO THE CSA – PPP ON AI, DATA AND ROBOTICS

➔ PUT THEIR COMMUNICABLE RESULTS ON THE AI-ON-DEMAND PLATFORM

➔ For more info – see infodays & Brokerage event:

PPP web-site: https://ai-data-robotics-partnership.eu/

& EC infodays: https://www.horizon-europe-infodays2021.eu/event/cluster-4-digital-industry-space

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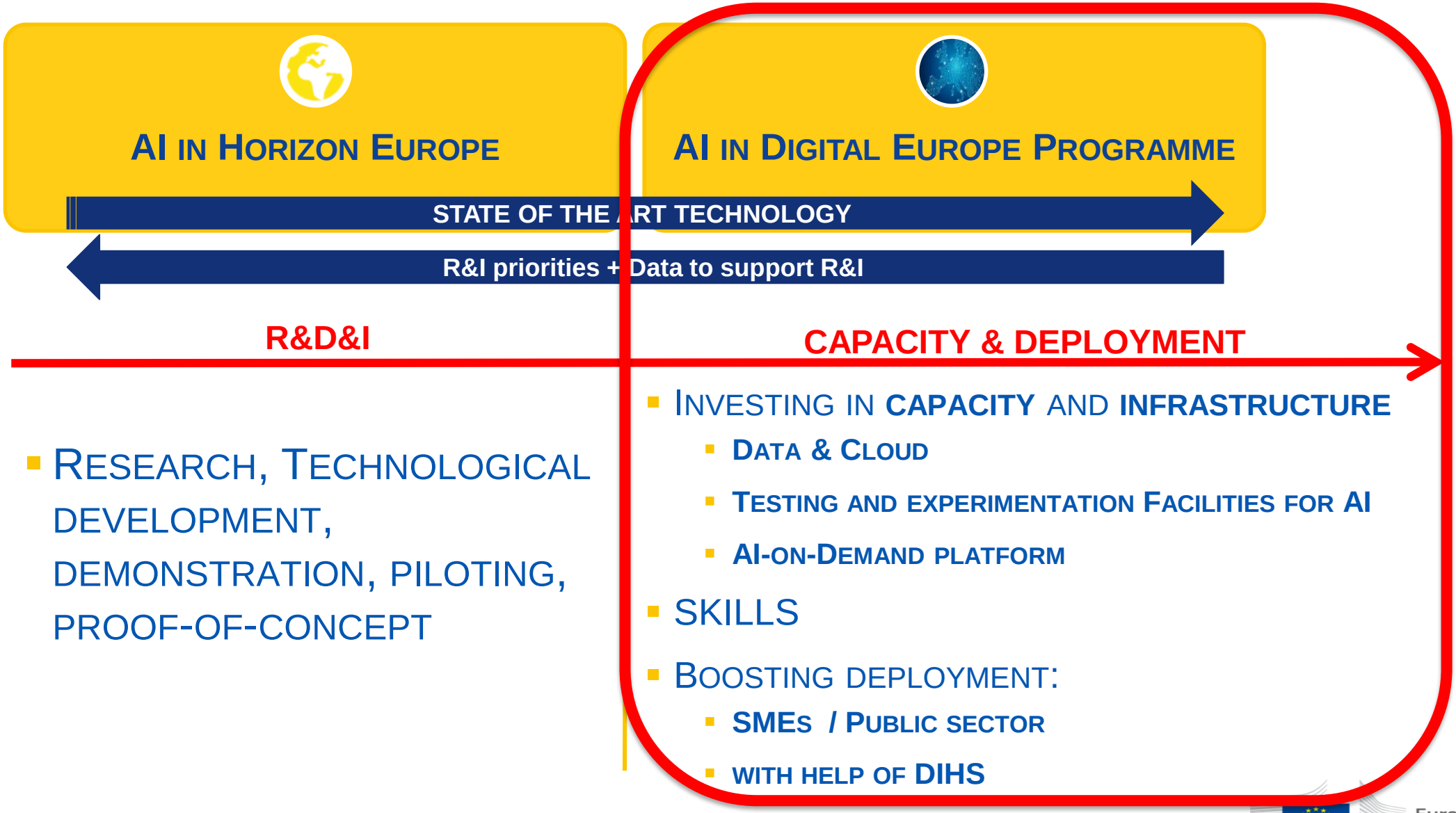
AI, Data and Robotics in the next funding programmes
Complementarity & Synergies



World-class Testing and Experimentation Facilities

- *A Reference **Testing and Experimentation Facility** is a technology infrastructure that has specific expertise and experience of **testing mature technology in a given sector**, under **real or close to real conditions** (e.g. smart hospital, smart city, experimental farm, corridor for connected and automated driving, etc.).*

- **Common resource** available to all European stakeholders to **validate new AI-based solutions** in real settings.

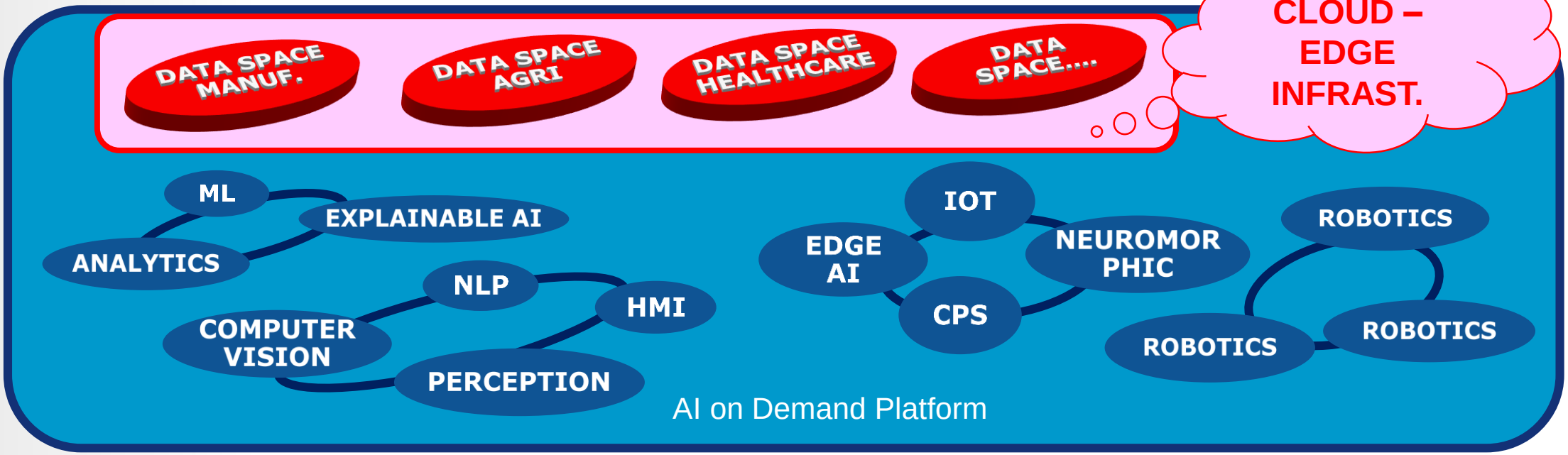
➔ 4 sectorial TEFs + 1 techno-centric: edge AI TEF

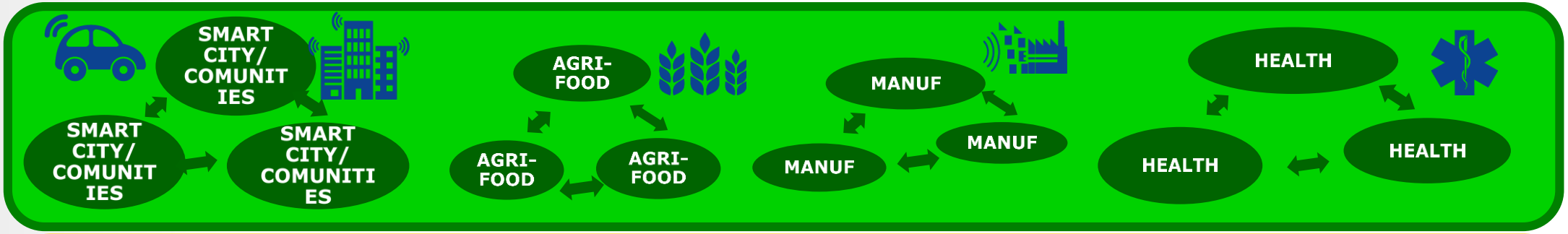
AI & DIGITAL: CAPACITY BUILDING & DEPLOYMENT

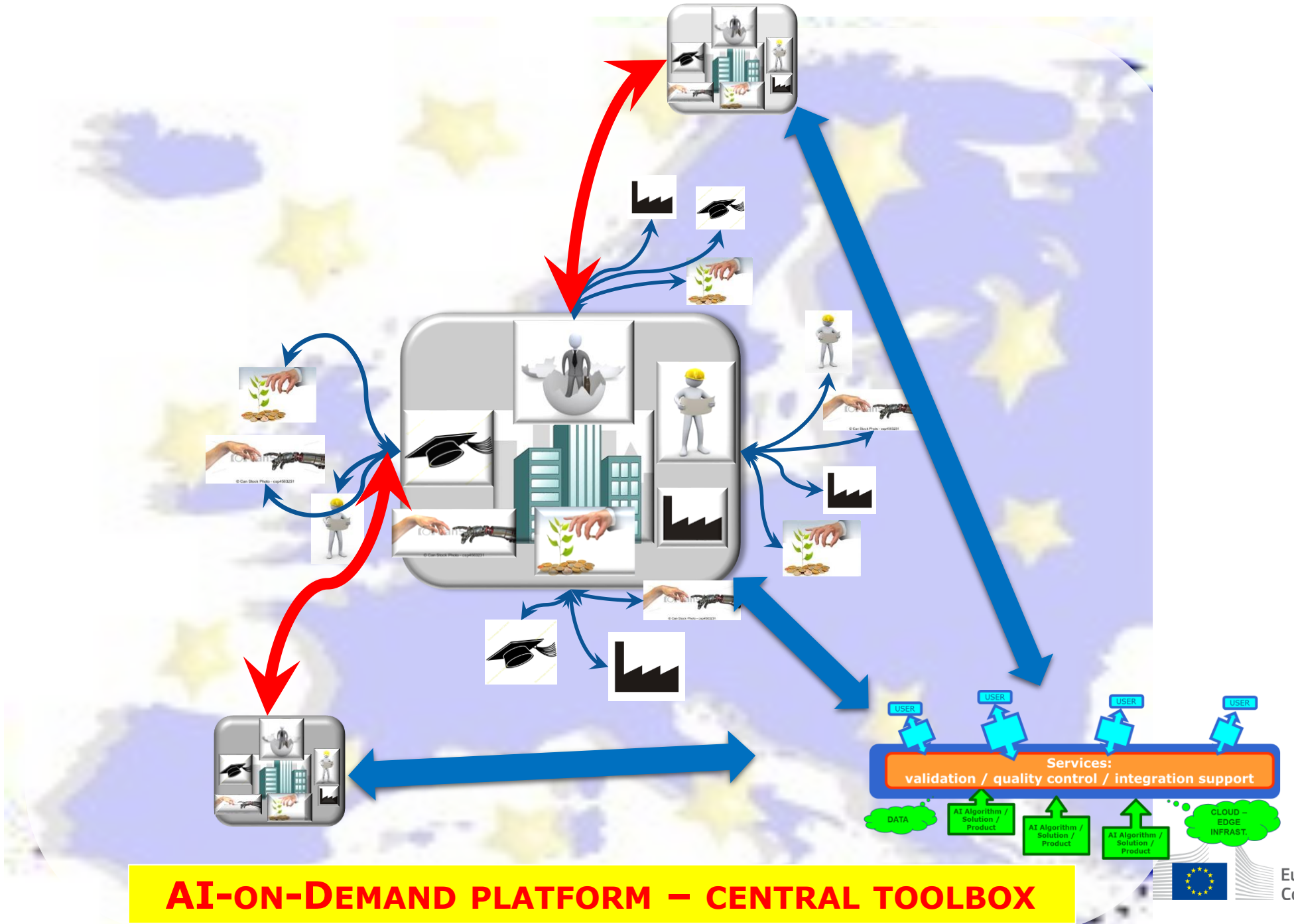
CAPACITY: infrastructure: **DATA-CLOUD** ALGO/HW

LARGE SCALE AI REF. TESTING* FACILITIES

DEPLOY: DISTRIBUTION CHANNEL SMEs/PUB. Service







AI-on-Demand platform – central toolbox

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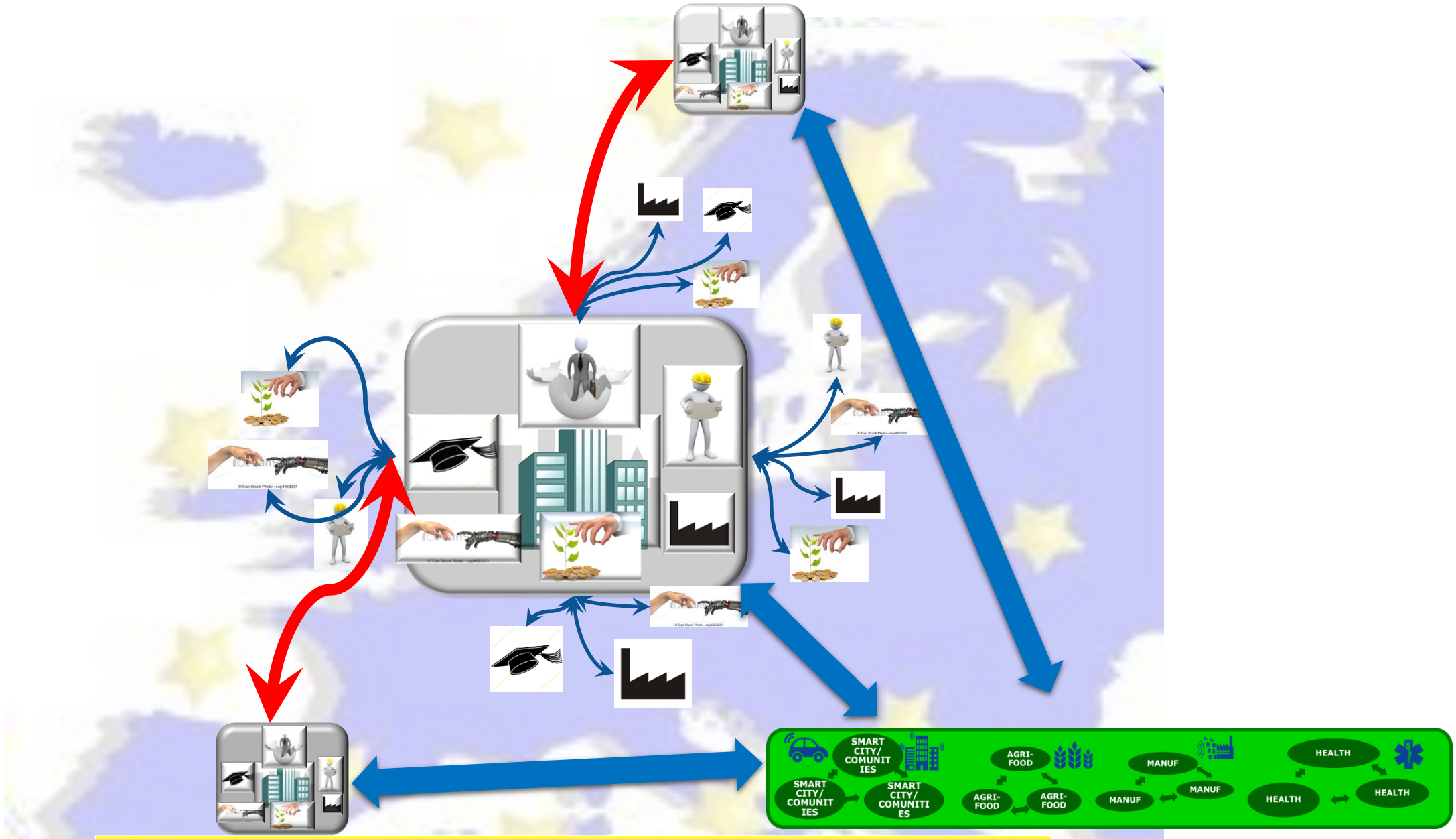

REFERENCE TESTING AND EXPERIMENTATION FACILITIES CENTRAL SHARED FACILITY

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Let’s make it happen together! Thank you for your commitment & cooperation

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