Robotics landscape and Responsible robotics

CNECT-A1
Robotics & AI Excellence and Innovation

COORDINATED PLAN ON ARTIFICIAL INTELLIGENCE: FOUR KEY POLICY OBJECTIVES

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
- 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

OBJECTIVE

Push S&T progress
For AI / Robotics for Good and for ALL
"Made in Europe": Human centred & trustworthy

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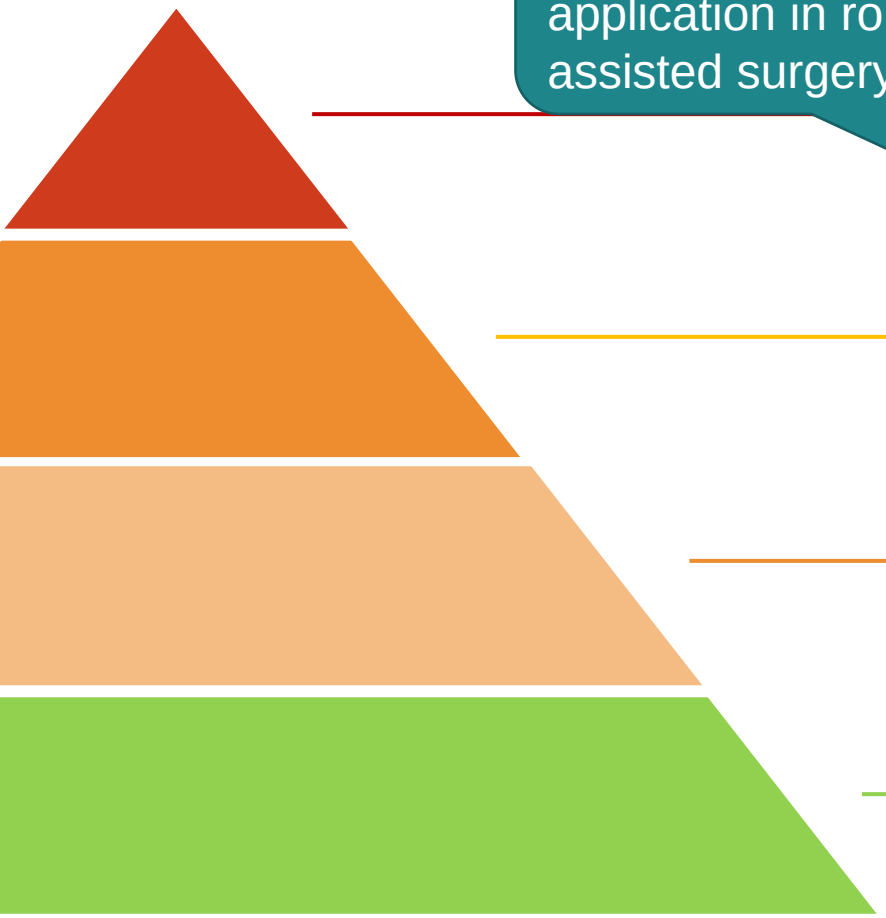
A risk-based approach to regulation



Safety components of products (e.g. AI application in robot-assisted surgery)

Unacceptable risk — **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 — **Permitted** but subject to information/transparency Obligations

Minimal or no risk — **Permitted** with no restrictions

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Requirements for high-risk AI

Establish and implement **risk management** processes

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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

New Machinery Regulation 2023/1230

- Guarantee the safety of consumers and encourage innovation.
- Phased implementation process that extends from now to 2027.
- Address the risks stemming from new technologies (**in particular robots using artificial intelligence technologies**) while allowing for technical progress.

New Machinery Regulation 2023/1230

- The definition of safety components now explicitly acknowledges the **relevance of digital components**, providing clear guidelines on the inclusion of digital safety components within the regulatory scope.
- Conformity Assessment Specific Requirements:
  - Six specific machinery and related product categories required to undergo dedicated conformity assessments.
  - Emphasis on ensuring trustworthiness and safety for newer categories of machinery, including those with self-evolving behavior and machine learning capabilities.

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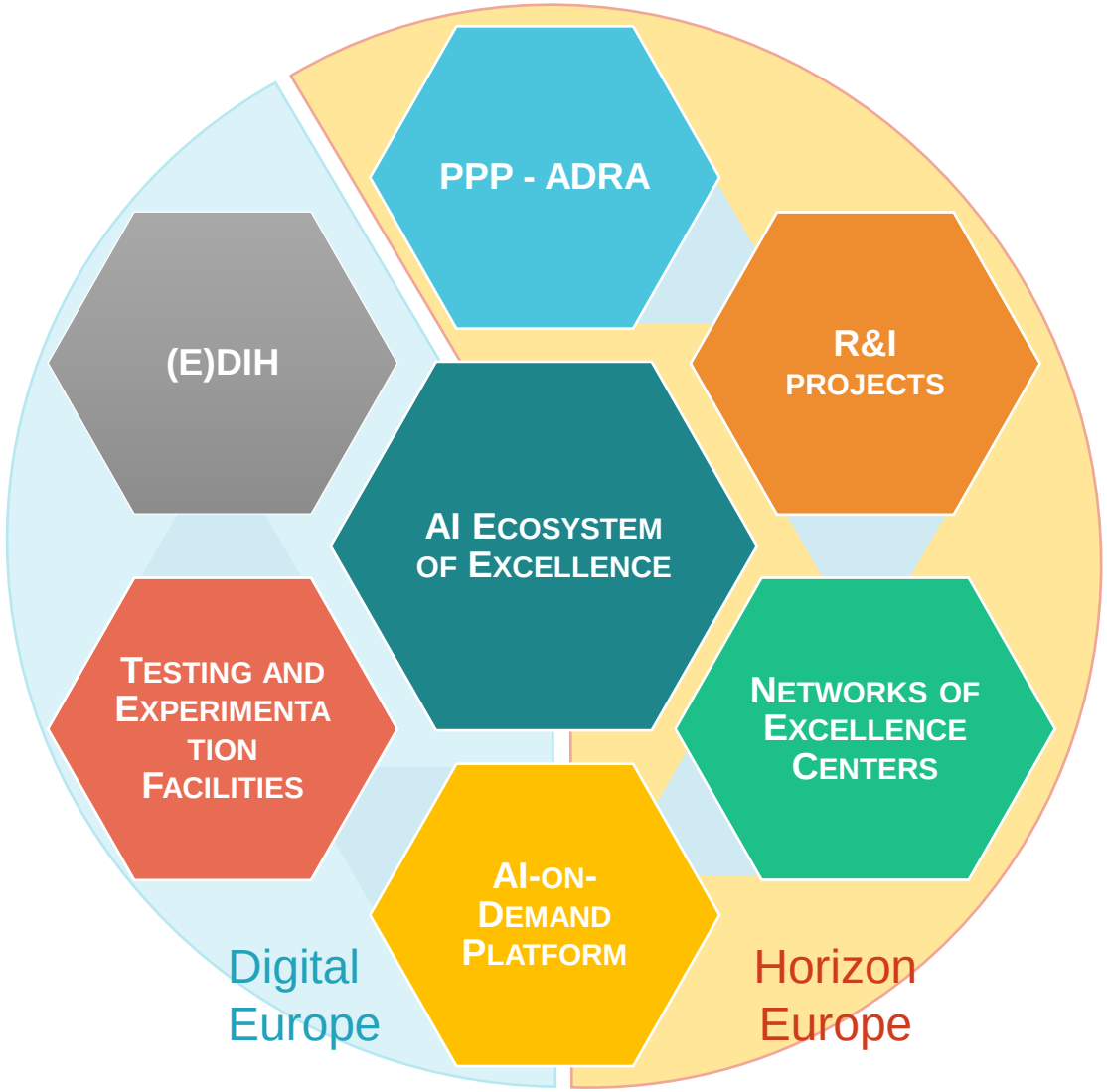
Ecosystem of Excellence in AI: From the Lab To the Market



INVESTMENT COMMITMENTS

- 1Bn€/Year EU FUNDING
- 20Bn€/Year invest @EU level

DIGITAL DECADE TARGETS

- by 2030, 75% of European enterprises have taken up AI

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Investments in robotics

- **On-going projects WP-2021 (total budget 85 ME)**
  HORIZON-CL4-2021-DIGITAL-EMERGING-01-09: AI, Data and Robotics for the Green Deal (AI, Data and Robotics Partnership) (IA)
  HORIZON-CL4-2021-DIGITAL-EMERGING-01-10: AI, Data and Robotics at work (AI, Data and Robotics Partnership) (IA)
  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)

- **On-going projects WP-2022 (total budget 55 ME)**
  HORIZON-CL4-2022-DIGITAL-EMERGING-02-05: AI, Data and Robotics for
  Industry optimisation (including production and services) (AI, Data and Robotics Partnership) (IA)
  HORIZON-CL4-2022-DIGITAL-EMERGING-02-07: Increased robotics capabilities demonstrated in key sectors (AI, Data and Robotics Partnership) (IA)

Investments in robotics

- **On-going projects WP-2023(total budget 54 ME)**
  HORIZON-CL4-2023-DIGITAL-EMERGING-01-02: Industrial leadership in AI, Data and Robotics – advanced human robot interaction (AI Data and Robotics Partnership) (IA)
  HORIZON-CL4-2023-HUMAN-01-02: Large Scale pilots on trustworthy AI data and robotics addressing key societal challenges (AI Data and Robotics Partnership) (IA)

- **Calls to be evaluated in 2024 (total budget 60 ME)**
  HORIZON-CL4-2024-DIGITAL-EMERGING-01-04: Industrial leadership in AI, Data and Robotics boosting competitiveness and the green transition (AI Data and Robotics Partnership)

Investments in robotics

Important Remarks:

- This list is not exhaustive, as investments may have occurred in other Horizon Europe clusters, missions, etc.
- Projects within this context may sometimes emphasize the robotics domain as their primary focus, while others address a combination of the three domains: AI, data, and robotics. The prevailing trend is to leverage projects that harness the strengths of these interconnected domains.
- Large and strategic initiatives, such as the Testing and Experimentation Facilities (TEF) and the European Digital Innovation Hub (EDIH), have broader scopes that encompass various technological domains. Robotics is one of the areas covered by these initiatives, reflecting their comprehensive approach to digital innovation.

Huge potential for Europe*

➔ The European Service Robots Market is expected to register a **CAGR** of around **14%** during the period 2021 - 2026.

➔ **Europe** is one of the **big markets** for service robotics

➔ **486 out of the 1068** (~46%) suppliers of professional service robots come from Europe(IFR).

➔ **Service robots (smart robots)** are generally used for tasks that are **dangerous, dull, dirty, or dumb** ➔ address societal challenges

* Source: Europe Service Robots Market | 2022 - 27 | Industry Share, Size, Growth - Mordor Intelligence

Robotics in the European AI strategy (COM(2018) 237 final)

- The EU aims to develop and use **AI for good and for all**, building on its values and its strengths.
- The **EU** has a strong scientific and industrial base to build on, with leading research labs and universities, recognised **leadership in robotics as well as innovative startups**.
- Pivotal role of AI powered robotics as a catalyst for enhancing Europe's productivity, competitiveness, and resilience, while ensuring **open strategic autonomy and a sustainable digital economy.**

AI-powered Robotics: challenges

- Challenges due to the rapid integration of AI, Data and Robotics: ethical issues, societal concerns and regulatory complexities

- Potential **social impact of AI-powered robotics**, including concerns about job displacement, changes in the labor landscape, and the need to upskill the workforce to adapt to the evolving technological advancements.

- **Trust and acceptance** among the public: we need to address concerns related to transparency, accountability, and the responsible use of AI in robotics applications.

AI-powered Robotics: challenges

- We need to develop **robust legal frameworks and regulations** that can effectively govern the use of AI-powered robotics, ensuring the protection of individuals' rights, safety, and privacy.

- To ensure **inclusivity**, robotics solutions should respect cultural norms and diverse values while being accessible to all, including older individuals, people with disabilities, and marginalized communities.

AI-powered Robotics: opportunities

- Responsible robotics is not only an ethical imperative but also a strategic move to **maintain Europe's global competitiveness** in the robotics industry.
- Opportunity for Europe to demonstrate its commitment to ethical leadership, technological innovation, and societal well-being. This can serve as a **model for global best practices in responsible robotics**.
- We need to foster a comprehensive understanding of the ethical and societal implications of AI-powered robotics and its integration into policymaking and industry practices.

Robotics strategy and responsible robotics

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Robotics strategy: objective and vision

- Objective: Develop a comprehensive AI-Powered Robotics Strategy for the European Commission.
- Strategic Vision: position Europe as a global leader in AI-powered robotics, fostering innovation and economic growth.
- Drafting a comprehensive robotics strategy building upon the Coordinated Plan, ensuring alignment with current developments and priorities.

Robotics strategy: scope

- The scope of the AI-Powered Robotics Strategy is comprehensive, covering various facets of this dynamic field.
- This strategy will address both technical and non-technical aspects to ensure a well-rounded approach.
- Non-technical aspects include building acceptance, trust, ethical considerations, safety, cybersecurity, liability, and addressing societal concerns.

Robotics strategy: stakeholder engagement

- Connect with the robotics DIH to leverage their insights into drivers and barriers for the deployment of robotics solutions.
- Use the feedback collected from Robotics4EU project, on questions related to the deployment of responsible robotics.
- Engage private partners such as Adra in the collaboration for a comprehensive approach.
- Connect with MS for coordinated actions

Thank you for your attention

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