

Agenda Estratégica Europea en Inteligencia Artificial, Big Data y Robótica



Madrid Robotics Digital Innovation Hub

26 de noviembre de 2020, Madrid

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DIH: Excelencia en Robótica Inteligente

Investigación y
Desarrollo



Transferencia de
Tecnología



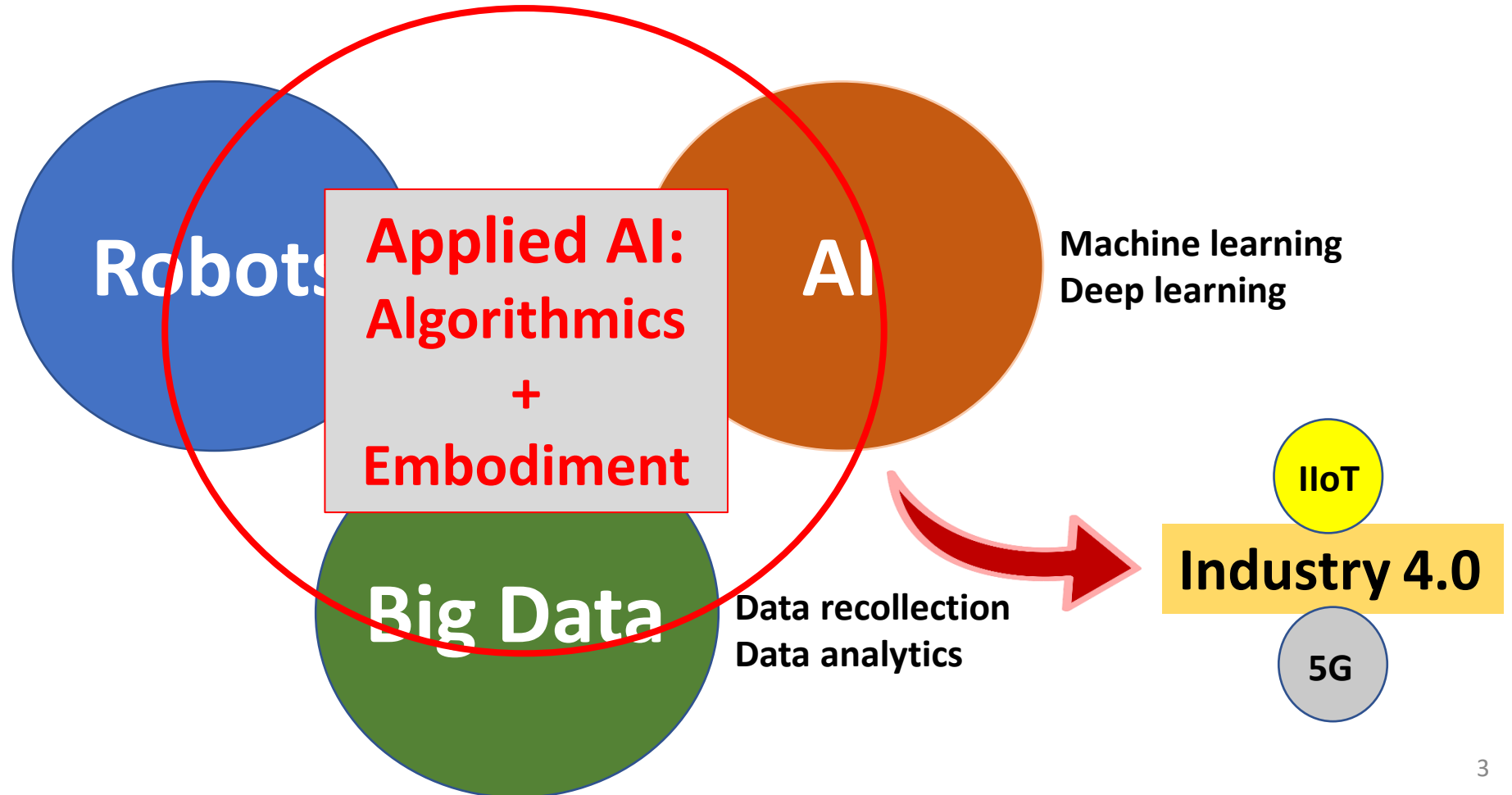
Creación de
Empresas



EU vision of AI, Data and Robotics (I)



Intelligent Robots
Social Robots



EU vision of AI, Data and Robotics (II)



***“Robotics and AI are two sides
of the same coin”***

**Dr. Juha Heikkilä, Head of Robotics and
Artificial Intelligence Unit of the DG
CONNECT**

*Digital Excellence Forum @ ICT Proposers'
Day 2019 (19-20 September 2019)*

PPP in AI, Data and Robotics

Public-Private
Partnership in
Robotics



Public-Private Partnership
in
AI, Data, Robotics



CLAIRE



EC (Public)

Work
Programme

Call
implementation

Partnership General Objectives



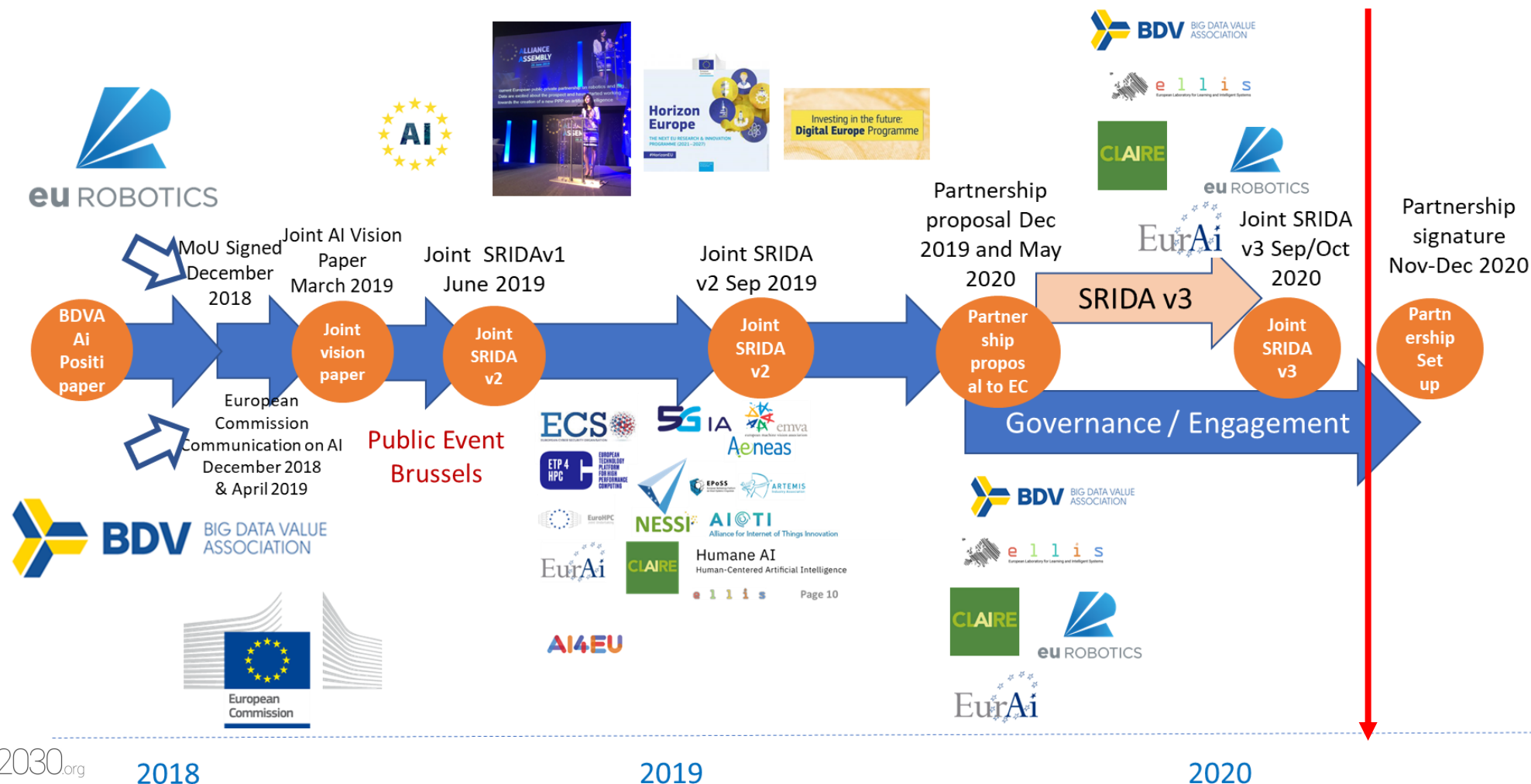
Secure **European's sovereignty** over AI, Data and Robotics technologies and knowhow

Establish **European leadership** in AI, Data and Robotics technologies with high socio-economic impact

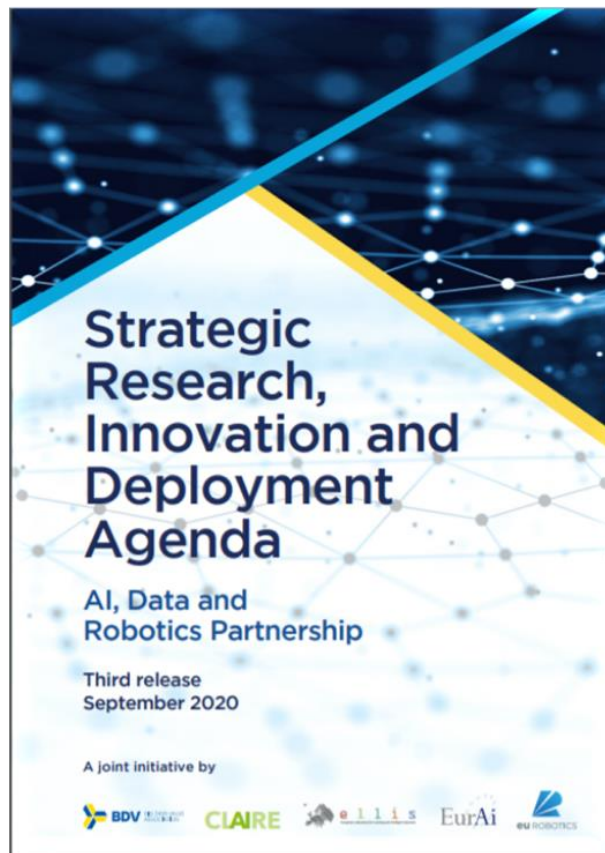


Reinforce a **strong and global competitive position** of **Europe** in AI, Data and Robotics

SRIDA: Timeline



SRIDA in AI, Data and Robotics



<https://ai-data-robotics-partnership.eu/wp-content/uploads/2020/09/AI-Data-Robotics-Partnership-SRIDA-V3.0.pdf>

SRIDA: Operational objectives

Lead and support **research** beyond state-of-the-art around AI, Data and Robotics

Integrate and **build** **systems** around AI, Data and Robotics

Collaborate with other **horizontal** and **vertical** communities

Promote **SMEs** and **stimulate** **investment**

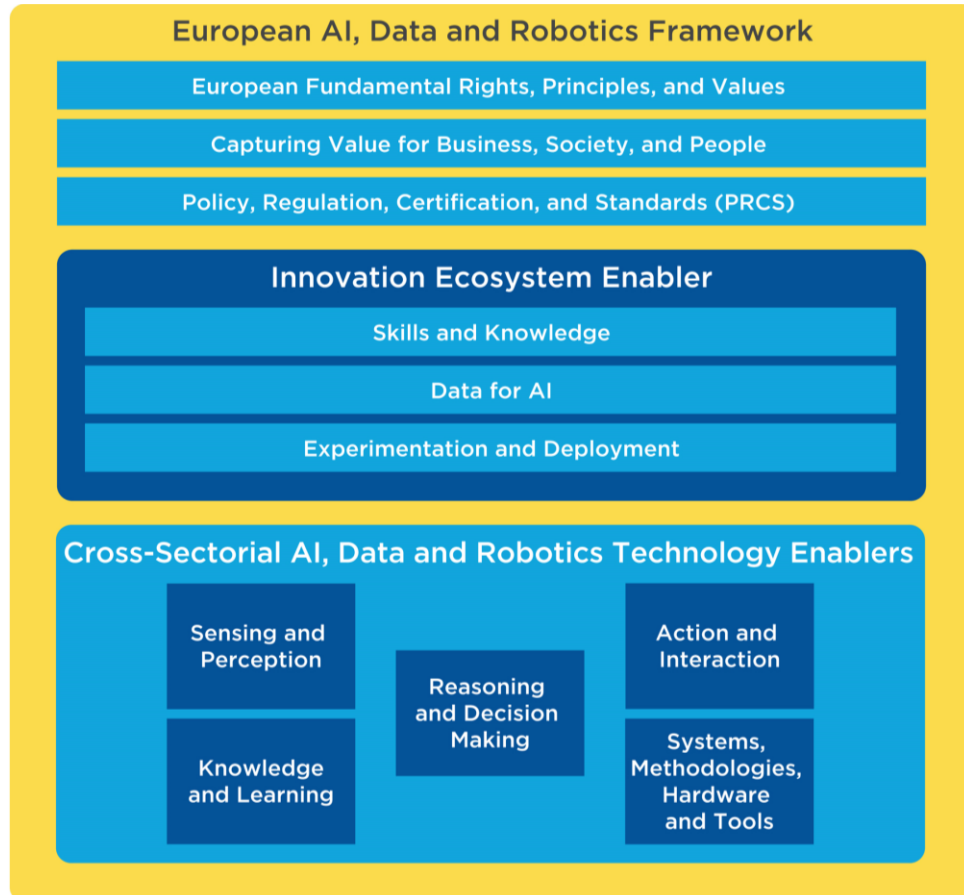
Accelerate digital transformation and **uptake** of industry in **all** **sectors**

Foster **AI** **Skill** **building** & strengthen **societal** **awareness**

Work towards aligning **legal** **foundations** **standards** & **regulations**

Develop and implement mechanisms to create an **effective** & **accessible** **ecosystem**

SRIDA: Framework and Enables



European Fundamental Right, Principles and Values

- Products and Services based on AI, Data and Robotics must be based on values that are compatible with European rights principles and values

Data for AI

- For AI, Data and Robotics to develop further, large volumes of cross-sectorial, unbiased, high-quality and trustworthy data need to be made available

Sensing and Perception

- Aggregate signals that represent real-world parameters

Knowledge and learning

- Involves transforming, storing, modelling and simulation

Reasoning and decision-making

- Decision making, mixed decision making and decision support

Actions and interactions

- Human-robotic interaction in human environment

Systems, Methodologies, Hardware and tools

- Methodology that enable the construction and configuring of intelligent robots

SRIDA: Technology priorities (1)

- **Data Protection and privacy**

- Data protection in machine learning
- Data protection in dynamic environments, Explainable data protection
- Anonymisation and pseudonymisation

- **Sensing and Perception**

- **Trustworthiness:** Transparency of algorithms, data processing and management, traceability, privacy, integrity, and accountability
- **Data Heterogeneity:** Formats, collection mechanisms, access methods, flow, and meta-data, as well as coping with diverse environmental conditions (physical, technical, human)
- **Capacity:** Connectivity coverage, quality, and capacity for carrying large volumes of data, edge capacity and security to cope with big decentralised data and AI processing, energy consumption by physical sensors

- **Knowledge and Learning**

- **Data quality**
- **Extracting** meaningful insights and improving **knowledge** representation from heterogeneous data
- **Scaling** and Federation of Data and AI systems
- **Ethical implications** on the use of Data and Data-Driven AI
- Deriving value by combining data insights & **domain knowledge**

SRIDA: Technology priorities (2)

- **Reasoning and Decision-Making**

- **Heterogeneous Data:** Decision-making with high-velocity data from different sources (edge-fog-cloud), high-variety of data types and formats. Lack of datasets to train decision-making models
- **Trustworthiness:** Transparency, explainability. Lack of testing and validation of AI-based solutions
- **Reasoning:** Decision-making with symbolic, sub-symbolic, non-symbolic and heterogeneous knowledge under uncertainty

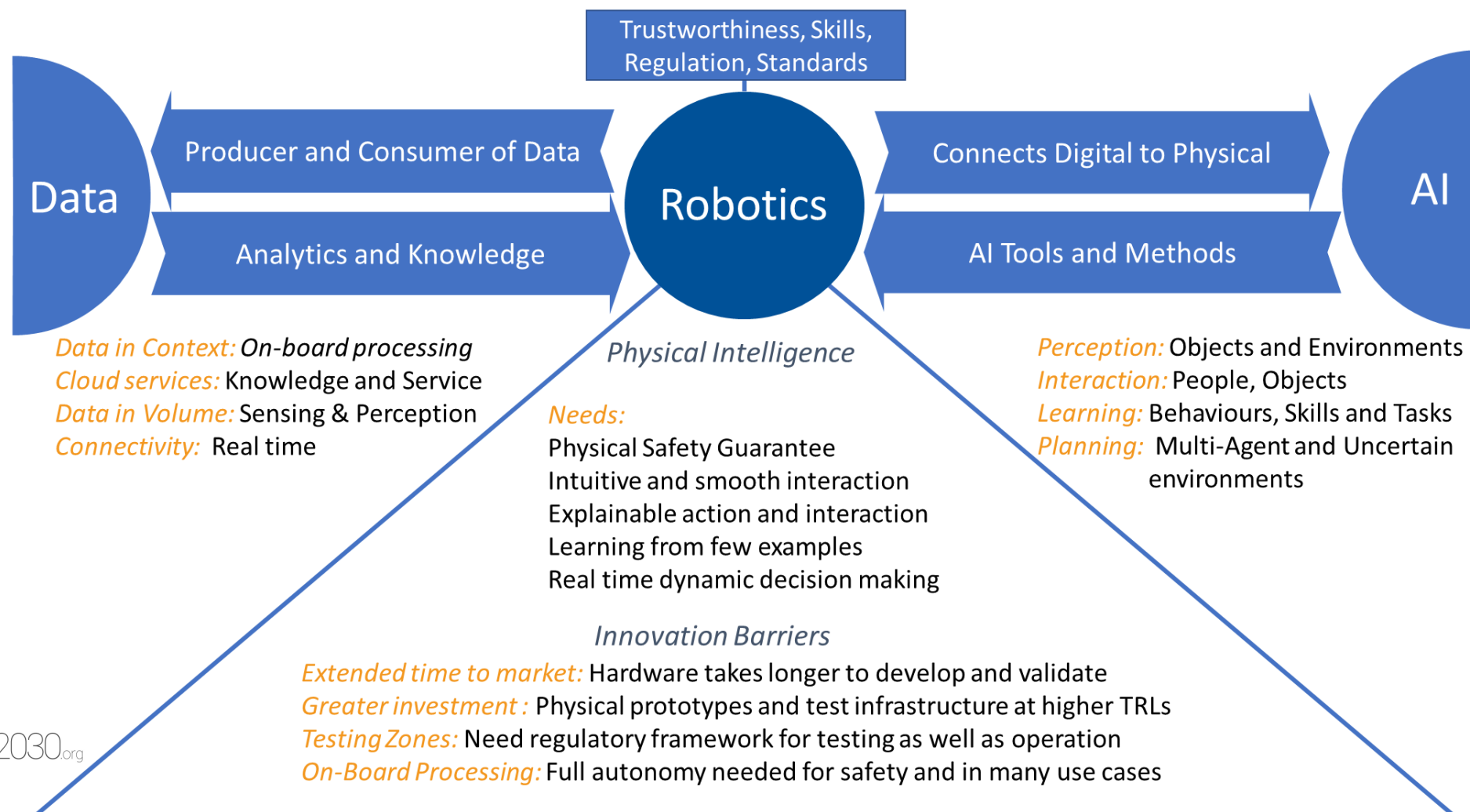
- **Action and Interaction**

- **Language understanding:** Improved natural language understanding, interaction and dialogue covering all European languages and age ranges
- **Collaborative intelligence:** Human and AI symbiosis
- **Natural interaction methods:** Enhanced interaction for humans across the continuum of computing environments
- **Data interaction technologies:** combining data-driven methods with Virtual Reality (VR) and Augmented Reality (AR) and their relation to human interaction both digital and physical
- **Safety-critical Interactions:** Ensure Safe interactions in safety-critical and unstructured environments

- **System, Methodologies, Hardware and tools**

- **Scalability:** lack of an ecosystem to guarantee access to computing infrastructures across Europe
- **Methodologies** design, implementation, and operation of data-processing hardware-agnostic pipelines
- **Reliability** Ensuring robust, safe, reliable, and trustworthy operation of AI systems
- **Deployment:** Deploying modern AI applications in the computing continuum (embedded-edge—fog—cloud) and the transition from development to production environments.

SRIDA: Robotics Deep-Dive (I)



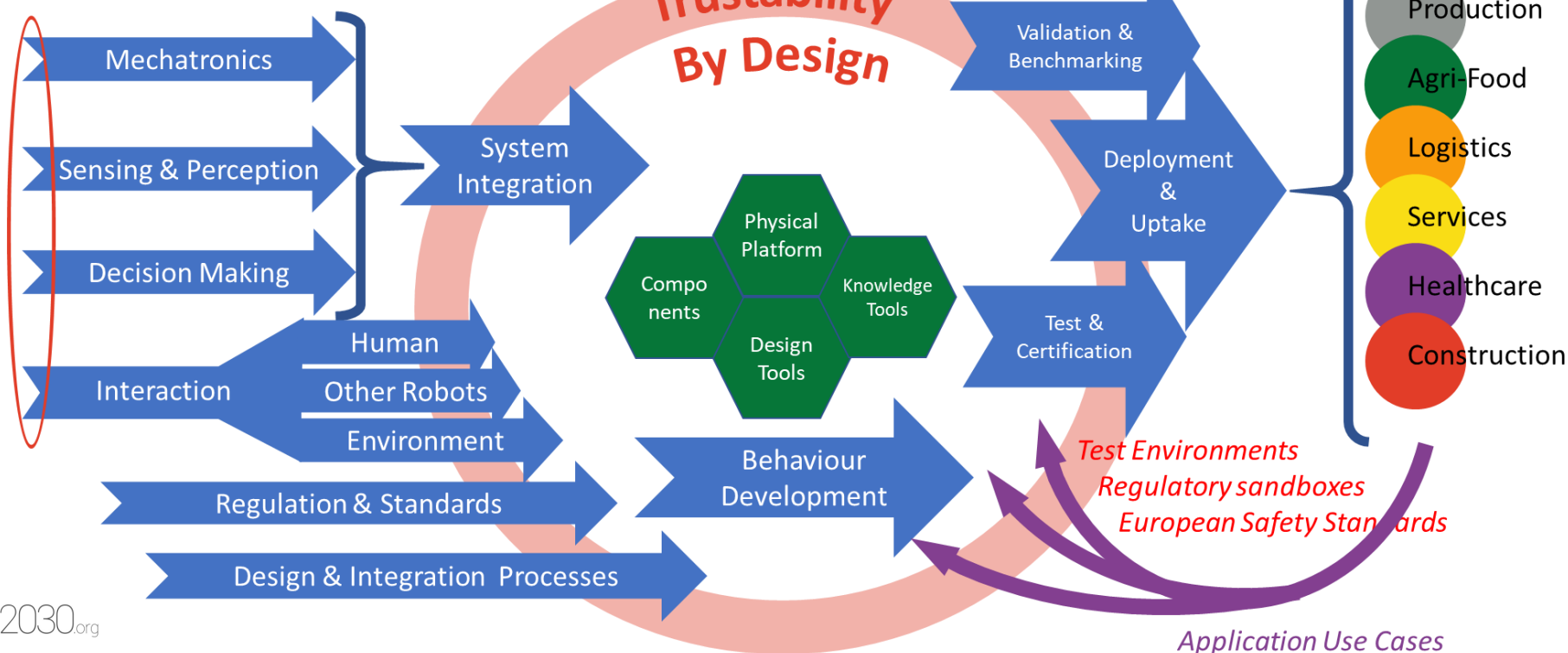
SRIDA: Robotics Deep-Dive (II)

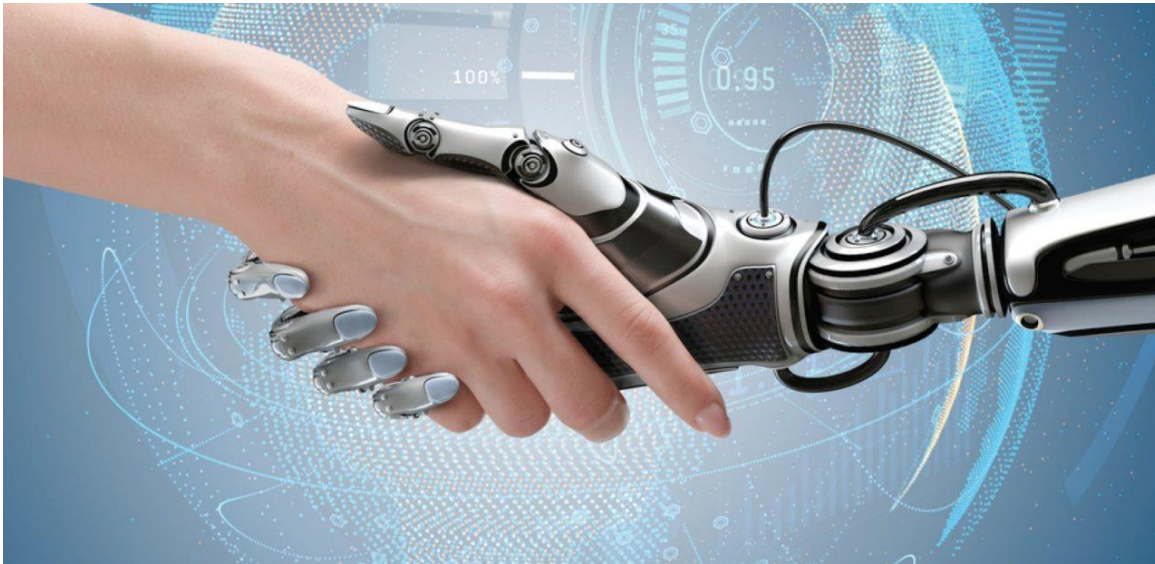
Key Challenges:

Heat, dust, pressure, people, explosive and toxic environments.
Handling foodstuff, fabrics, dexterous assembly.
Contextual and understandable interaction.
Economic validation and rapid deployment of applications

Enabling Technologies

"Faster, cheaper, better"





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