



Multimodal Generative AI in the Cloud-Edge Continuum: Conversational, Composable, Multilingual, Sovereign.

Cagliari 23 Settembre 2025



Funded by
the European Union
NextGenerationEU

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8ra CLOUD·EDGE CONTINUUM

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IPCEI-CIS and the vision of 8ra

Building the foundation for the next-generation cloud-edge infrastructure

IPCEI-CIS

- is one of the largest EU projects to secure future digital sovereignty,
- is a highly integrated project, and
- will develop the foundation for a sustainable cloud-edge continuum.



> 8ra will build something new! Leap frogging!

The 8ra Initiative: Umbrella for the IPCEI-CIS projects and more

IPCEI: Important Project of Common European Interest

- IPCEI is a key contributor **to economic growth, employment, competitiveness and resilience of the European industry and economy** through state funding.
 - Top priority instrument for coordinating **major investments** across member states
- An IPCEI must
 - ✓ have **at least four participating member states**,
 - ✓ contribute to the **strategic objectives** of the European Union,
 - ✓ be aimed at addressing a **serious market or system failure**,
 - ✓ have positive **spill-over effects** across the EU,
 - ✓ be very ambitious in terms of research and innovation, i.e. go well **beyond the international state-of-the-art** in the sector concerned.

Partner ecosystem of the 8ra Initiative

- **12 Member States**
- **120 national projects**
 - Approx. 8 billion Euro total investment
- **19 projects directly approved by the European Commission**
 - 1.2 billion Euro in public funding
 - 1.4 billion Euro in private investments



Challenges: How to master digital sovereignty?

Today: massive new investments by hyperscalers in Europe to meet fast increasing, AI-driven demand

Risk: lock-in effects, political, economical, and technological dependencies increase, rising market share of non-European companies



Reality check:
European companies can hardly compete

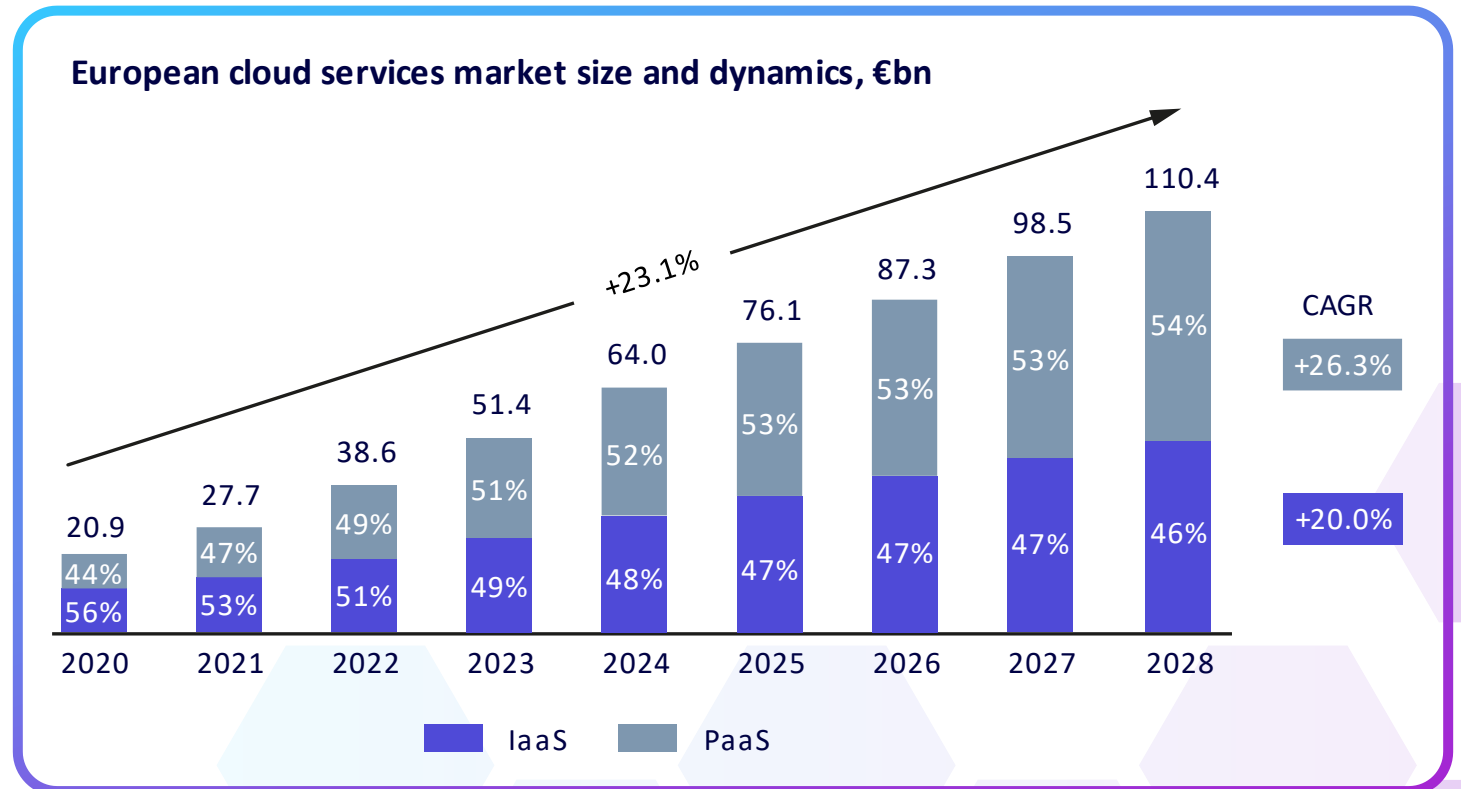


The urgent need for a sovereign cloud-edge infrastructure

8ra offers the opportunity to engage in a growing market

- The cloud market is expanding rapidly, with an annual growth rate of +23%.
- Non-European providers dominate the market and are predicted to increase market share further.
- Lock-in effects hinder free market development and innovations, and threaten digital sovereignty.

Growth of the European IaaS and PaaS Market (2017-2030, billion Euro)



Source: „European IAAS/PAAS Market“, BDO, June 2024

What will be the Impact of 8ra?

- **8ra** will enable unprecedented low-latency applications, e.g. for the domains of manufacturing, process industry and mobility/autonomous driving.
- **8ra** will eliminate lock-in effects and vastly improve the resiliency of enterprise software architectures.
- **8ra** will be the engine for the industrial metaverse.



Examples of 8ra focus clusters

Security Cluster



Increase the overall level of **cybersecurity** and **resilience** of European digital infrastructures and enable secure applications

AI Cluster



Target **novel AI applications** and create the technological bases for **AI/ML services** and **AI-based cybersecurity** solutions

Green Cluster



Significantly boost **energy efficiency** and **sustainability** of **next-generation** cloud infrastructures and services

Telco Cluster

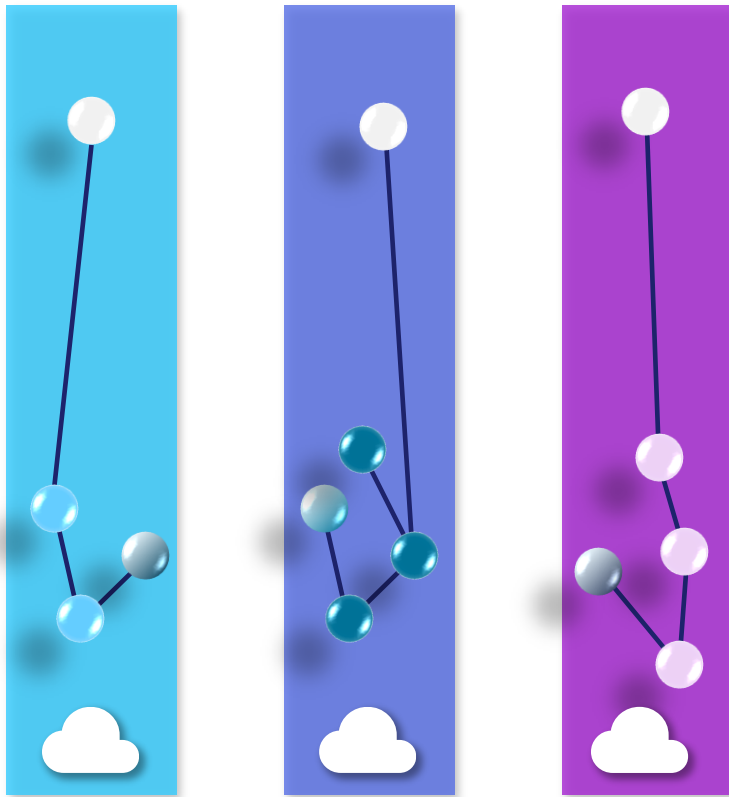


Enhance **cloud technology and infrastructure**, develop common software solutions and a **telco cloud reference stack**

Objectives for achieving [...]

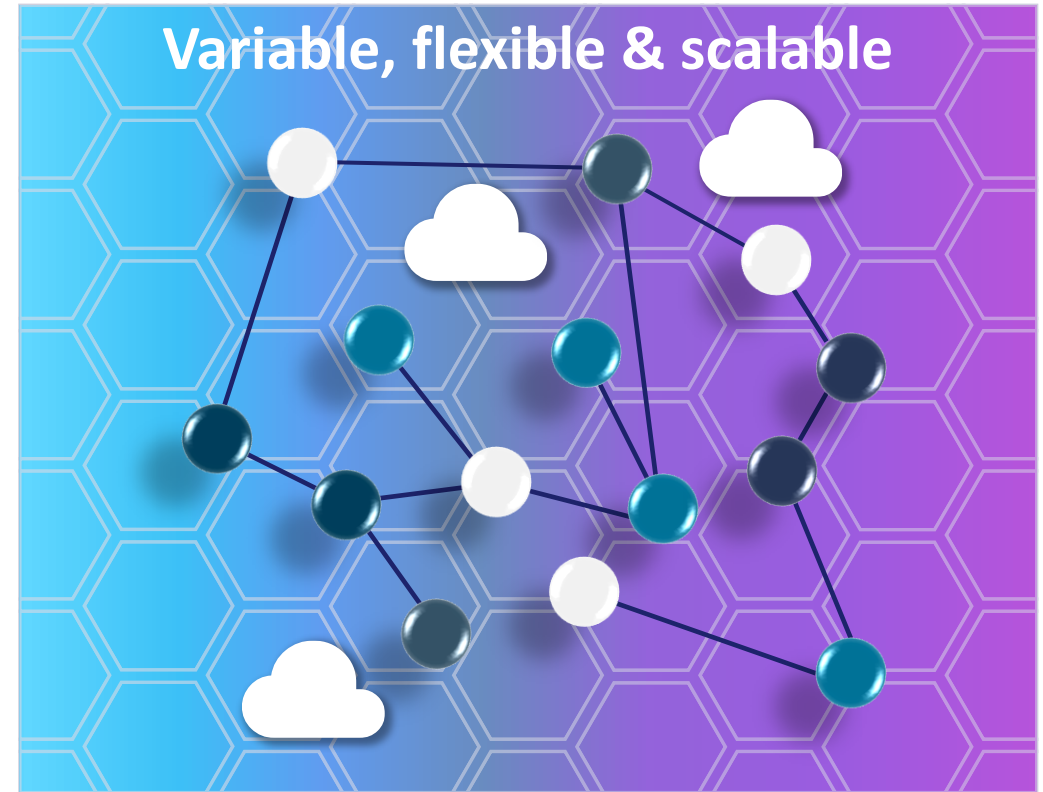


Shift towards a next generation continuum



Today clouds are organised in technology silos

will evolve to...

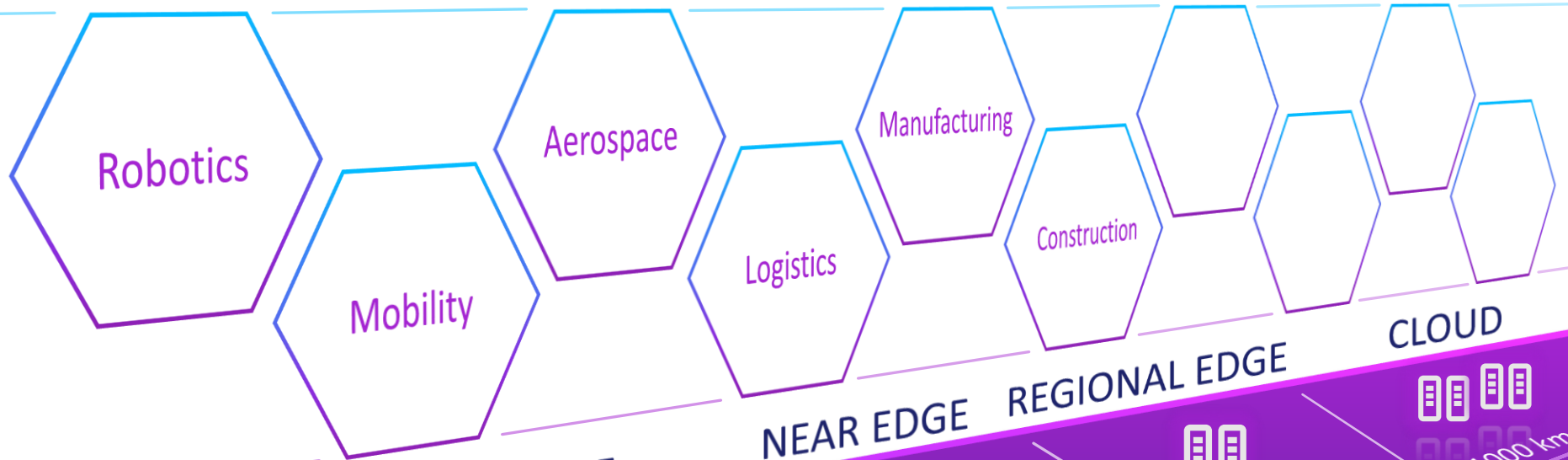


Next generation of cloud & edge mesh

Idea: cloud and edge are a continuum

Objective: creation of a Multi-Provider Cloud-Edge Continuum

Boost adoption and innovations throughout industries



ON-DEVICE

ON-PREMISE

FAR EDGE

NEAR EDGE

REGIONAL EDGE

CLOUD

Typical distance <1 km
Average latency 1 ms
Power range <20 kW

1-100 km
2-5 ms
20-100 kW

100-1000 km
10-20 ms
100kW -1 MW | 5-30 MW

>1000 km
>20 ms
50-100 kW



8ra Cloud-Edge Continuum

Features of the open federated infrastructure

Federated data processing (cloud - edge - device)

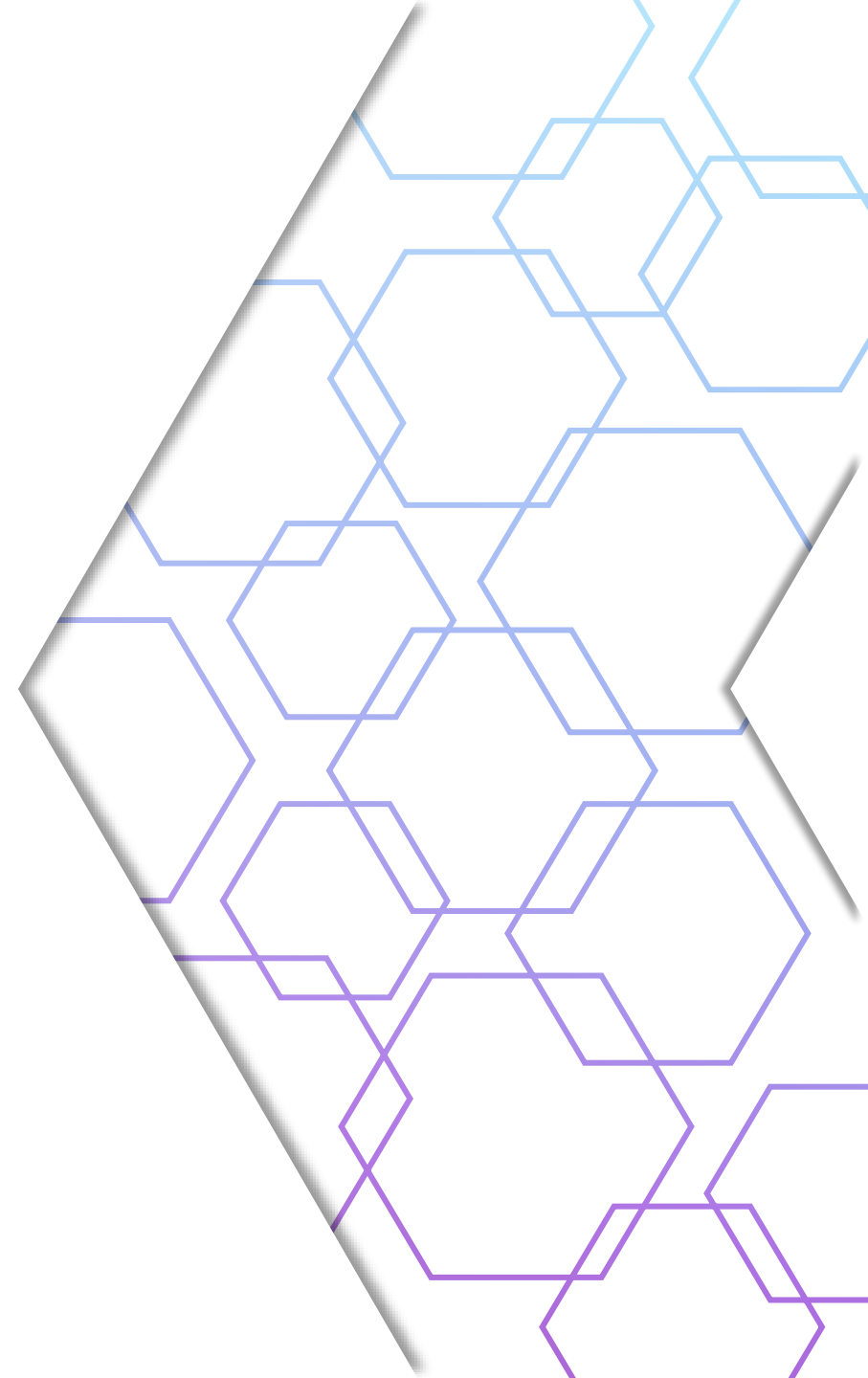
- Real-time data processing (latency & bandwidth guarantee)
- Enhanced data management
- Automated operations
- Resilience: decentralised workload distribution
- Enabling efficiency & integrated sustainability

Common specifications

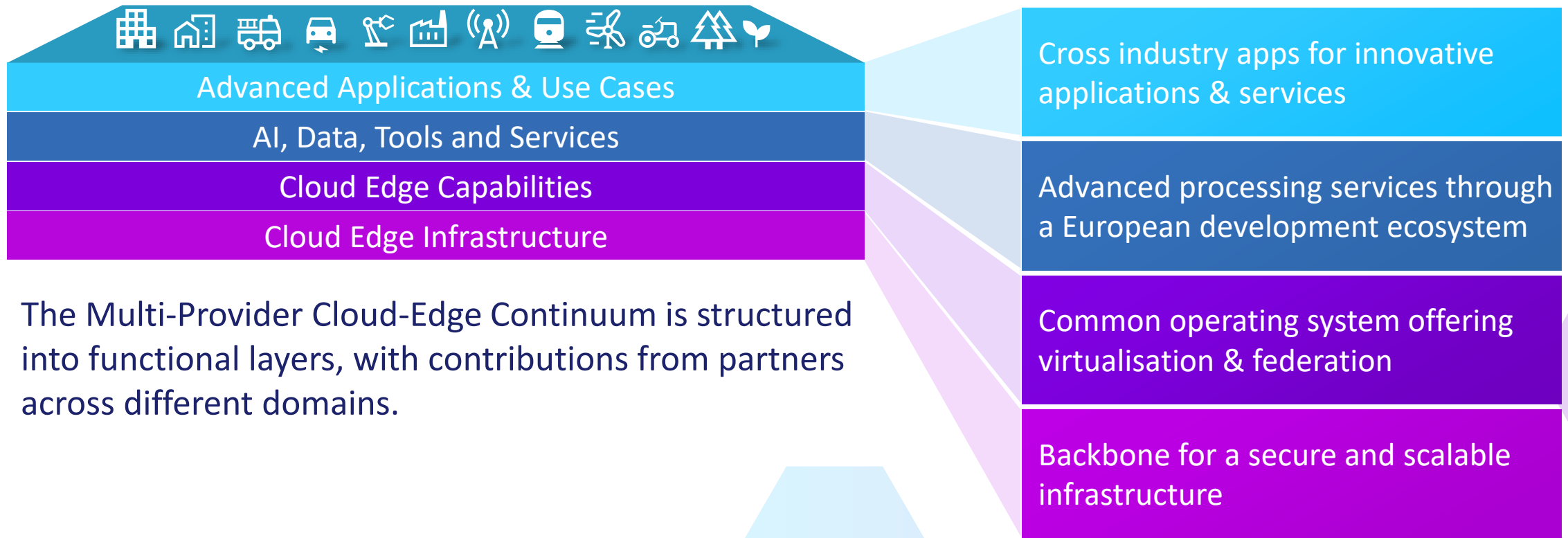
- Open reference architecture
- Smart APIs
- Security-by-design
- Enabling technologies (AI, IoT/OT, photonics, ...)

Common governance

- Rules & conformity
- Free open-source software & engaging community
- Open participation & low entry barriers
- Trust & transparency

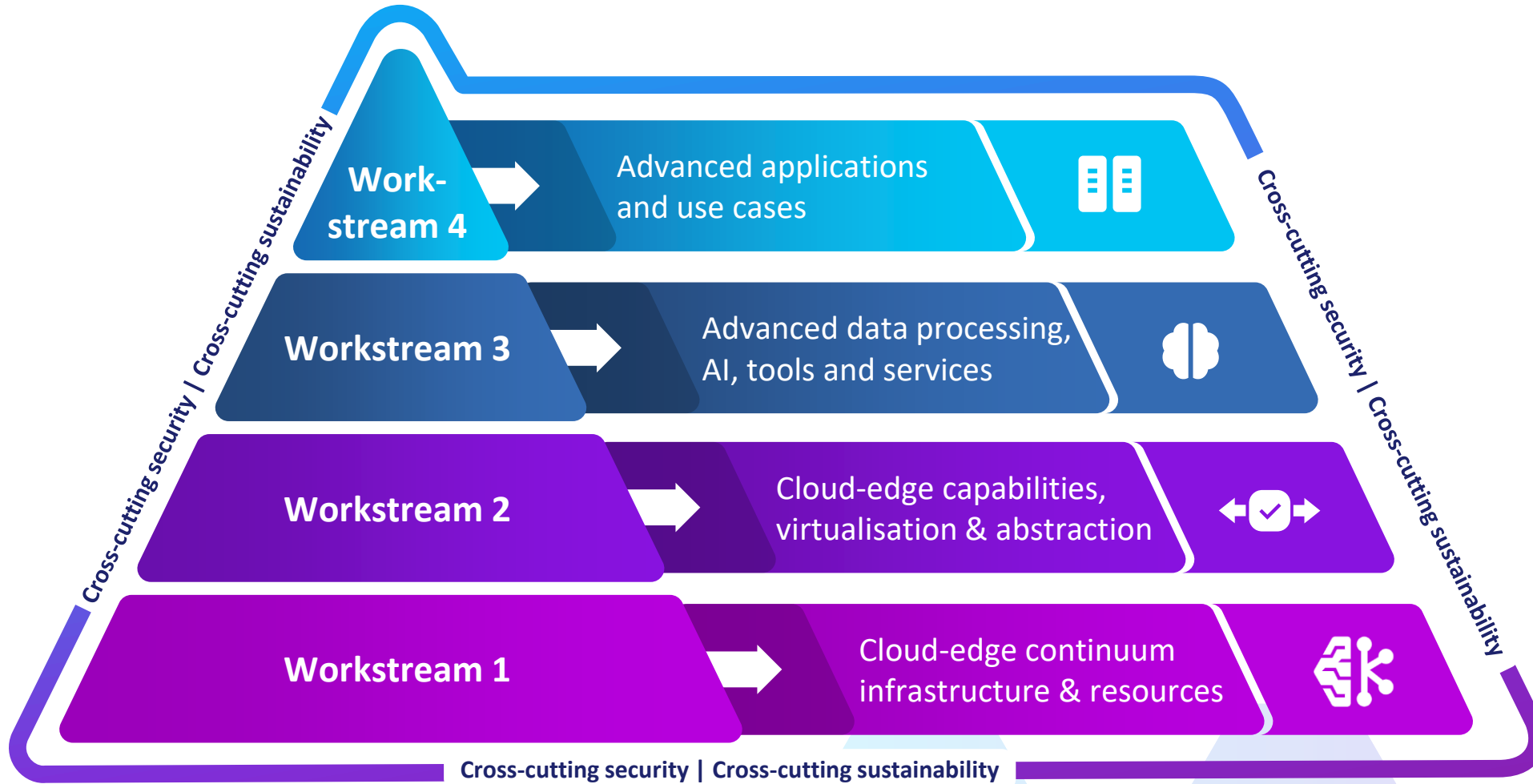


Layers of the Multi-Provider Cloud-Edge Continuum



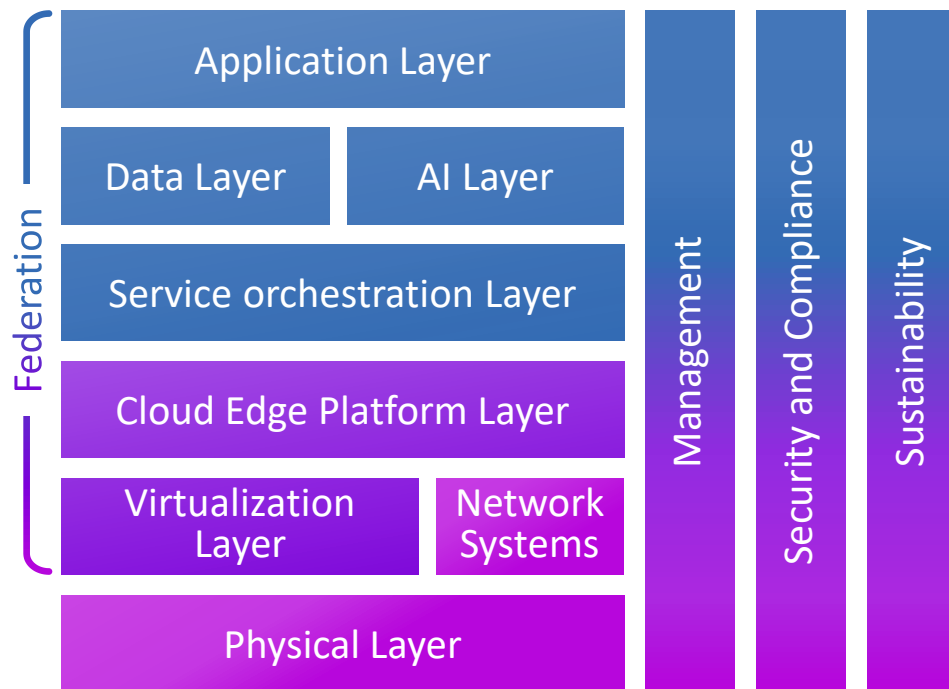
The Multi-Provider Cloud-Edge Continuum is structured into functional layers, with contributions from partners across different domains.

How we are organised

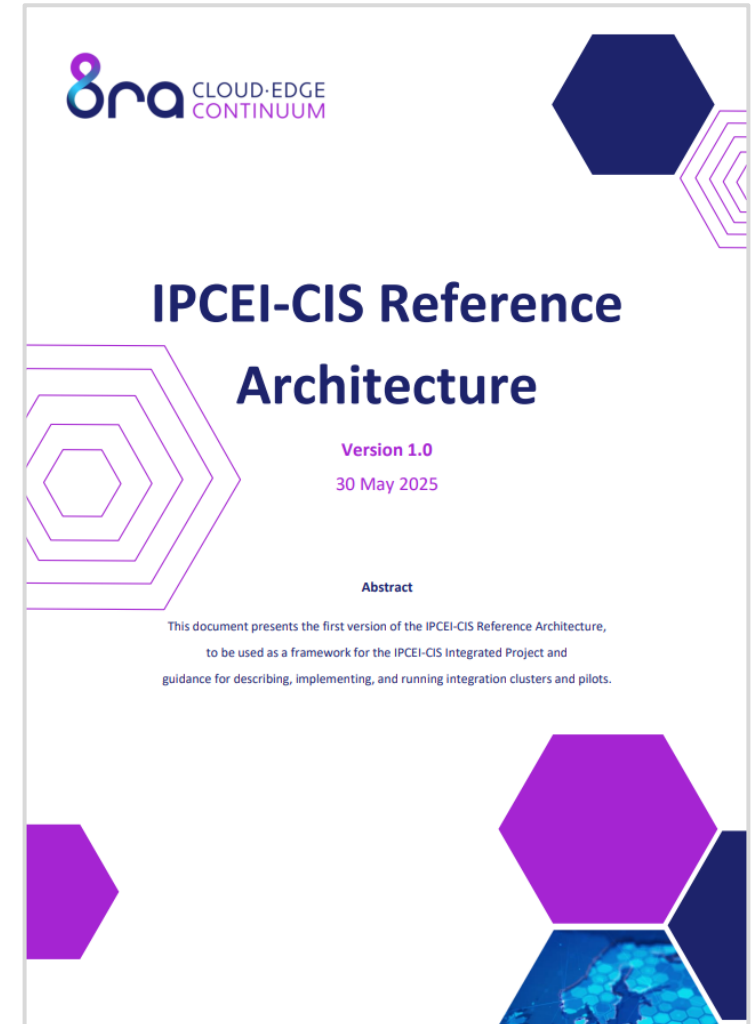


8ra / IPCEI-CIS Reference Architecture

The 8ra / IPCEI-CIS Reference Architecture serves as a foundational framework, providing a clear path for the integration of telco edge resources, cloud services, and technological components into the 8ra ecosystem.



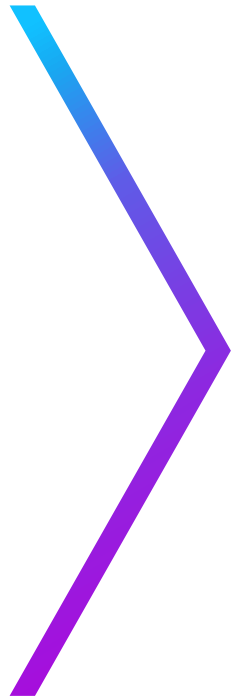
The Reference Architecture is published on www.8ra.com



Learn more about 8ra

For more information please visit:

8ra.com





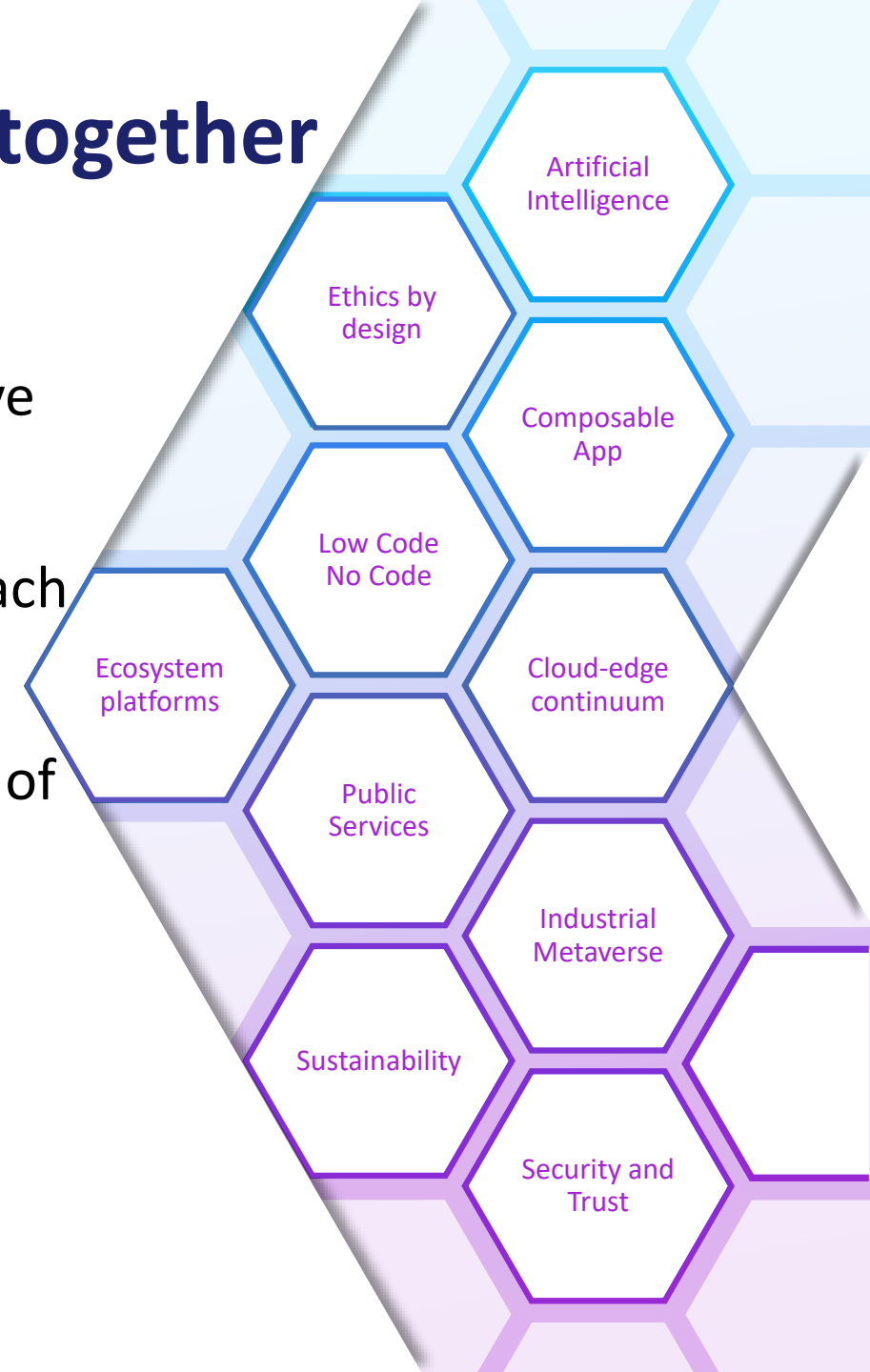
GENERATIVE AI MODELS
AND COMPOSABLE APPLICATION-SERVICES
ON CLOUD EDGE CONTINUUM

villanova.ai

Villanova: building AI faster, smarter, together

Villanova is working on research and developing innovative solutions.

- The **R&D&I** activities are divided in 2 Work packages, each aimed at the development of 2 products (mid 2026).
- The **FID** activities test and verify the proper functioning of all the R&D&I developments (2026 and 2027).
- The **MP** activities execute marketing strategies and commercial efforts to bring the 4 products to market.

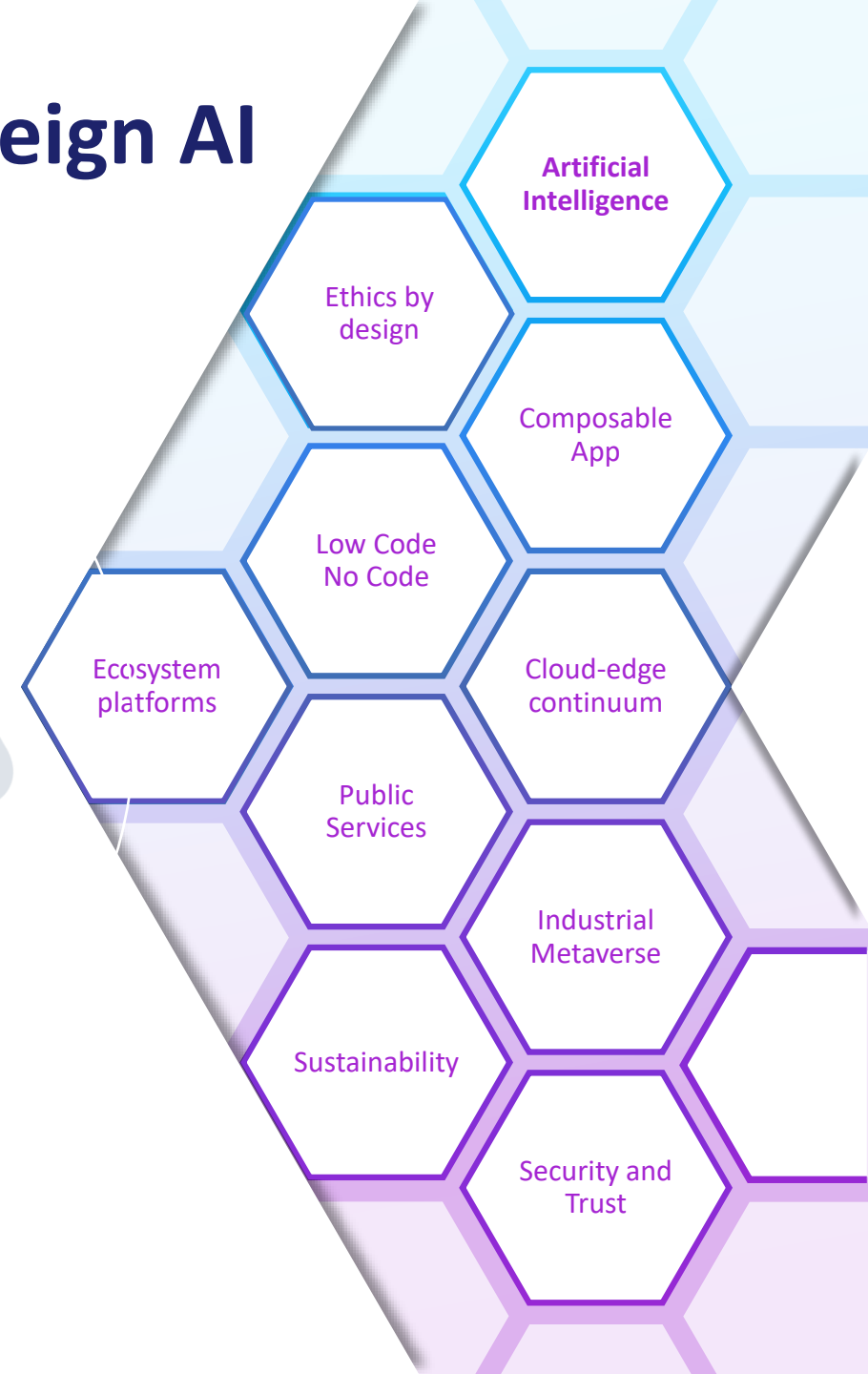


Villanova: Enabling Trusted and Sovereign AI

General Purpose LLM trained on European Datasets and tailored on five different EU languages (Italian, Spanish, French, German and English)

Federated Fine Tuning Pipeline fed with specific Datasets to specialize the LLM on vertical sectors

Starting point for Small World Models and Time Series models creation

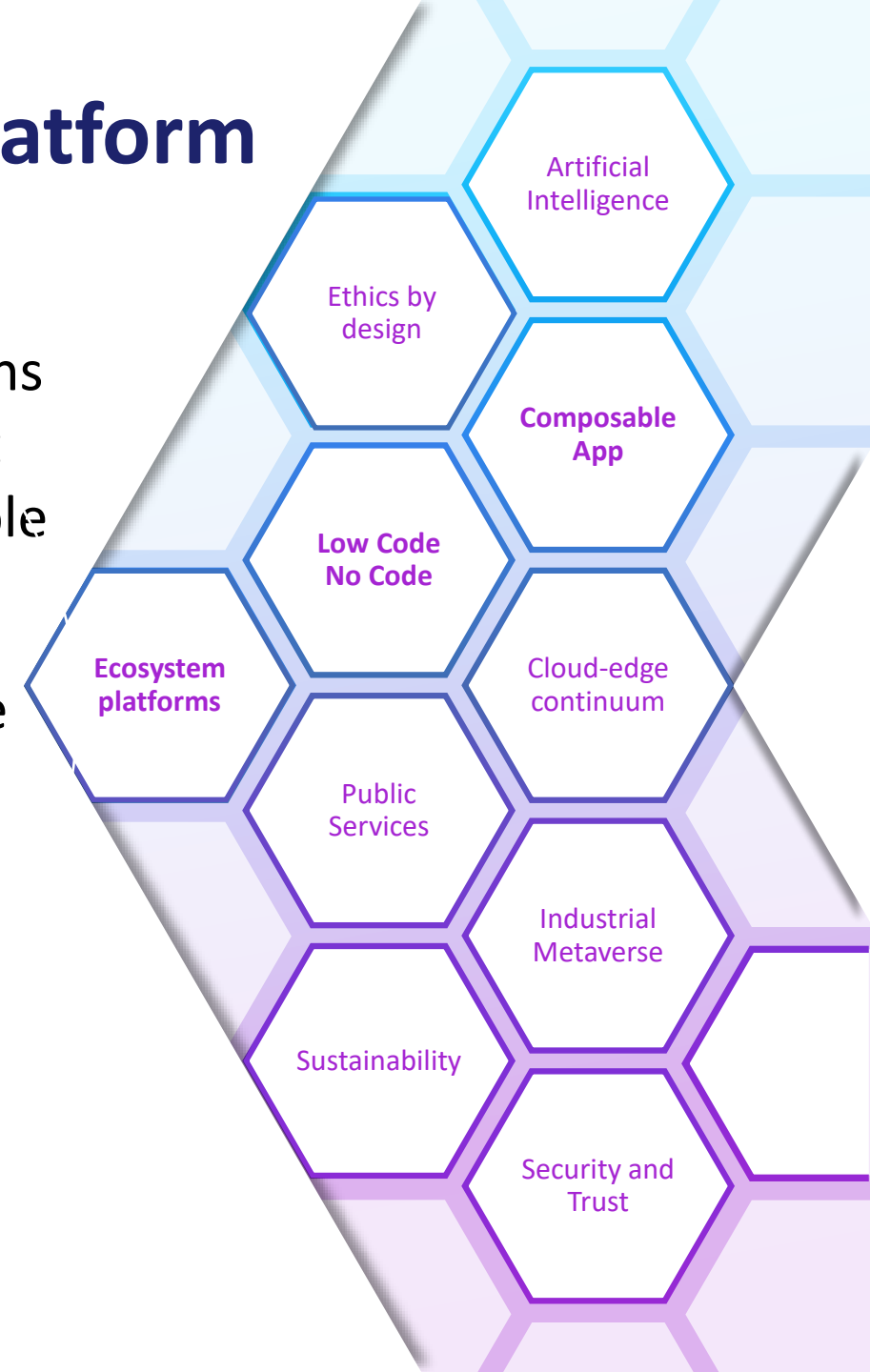


Villanova, the Agentic Composition Platform

Open-source LCNC framework for composable applications based on Generative AI components for real-time content generation and time-series forecasting assisted by Reusable NLP-powered AI agents for Human-AI interaction

Customized **Generative AI components** based on multiple vertical domains use cases

An **open-source** system that leverages Human-AI collaboration to create AI applications through modular and composable Low-Code/No-Code components, featuring elements AI enhanced.



AI Ethics by Design framework

Bias & Fairness

Detect and correct data and algorithm biases to ensure accuracy and equity.

Privacy & Data Protection

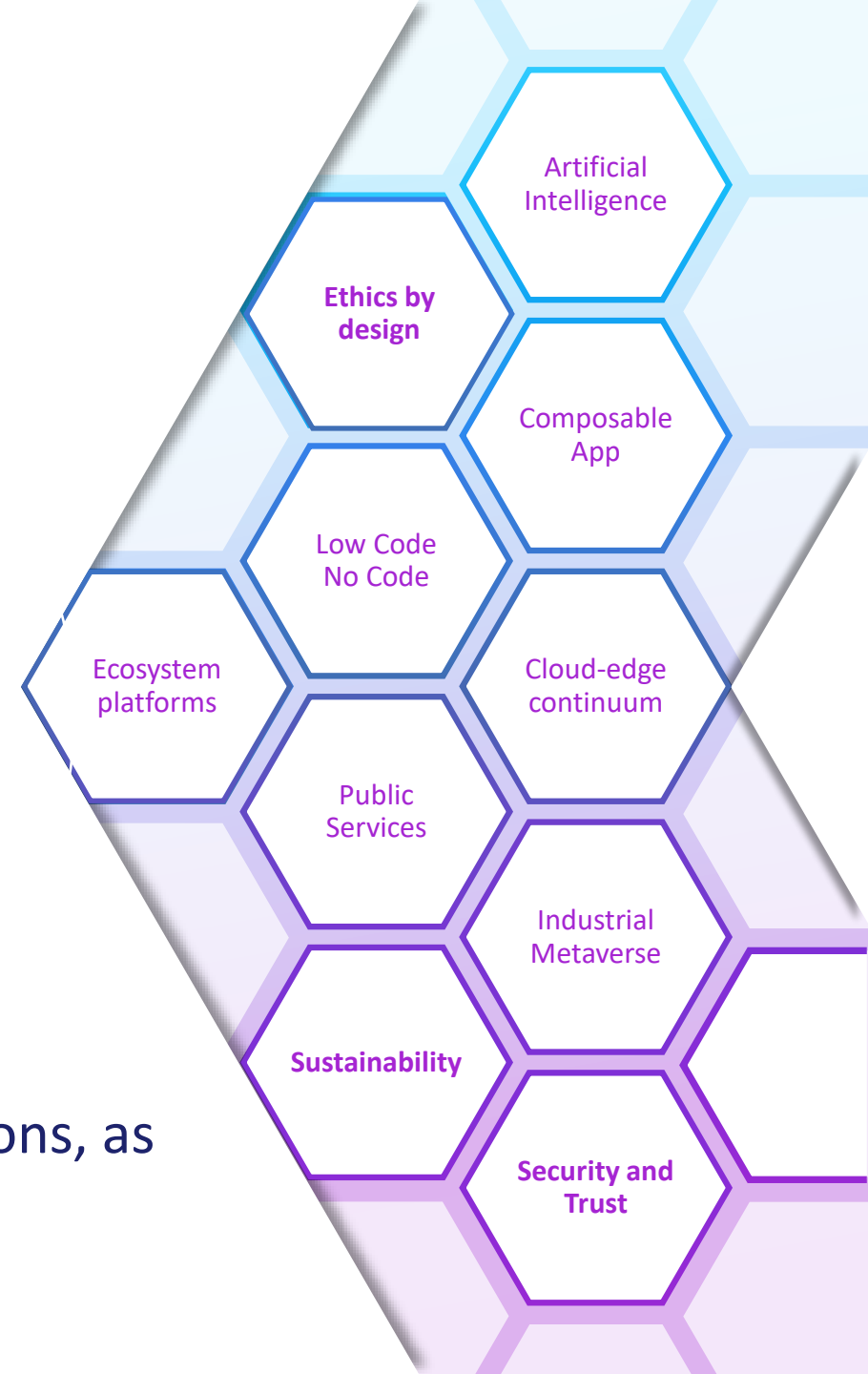
AI solutions that safeguard user privacy and prevent misuse or unauthorized access.

Transparency & Explainability

Make AI decisions understandable and algorithms more transparent to build user trust.

Human & Environmental Sustainability

Assess AI's impact on workers, skills, and workplace relations, as well as energy use, costs, and carbon emissions.



Villanova: exploring selected Use Cases

Lab8ra and **Ambition**: cross workstream validating use cases pilots

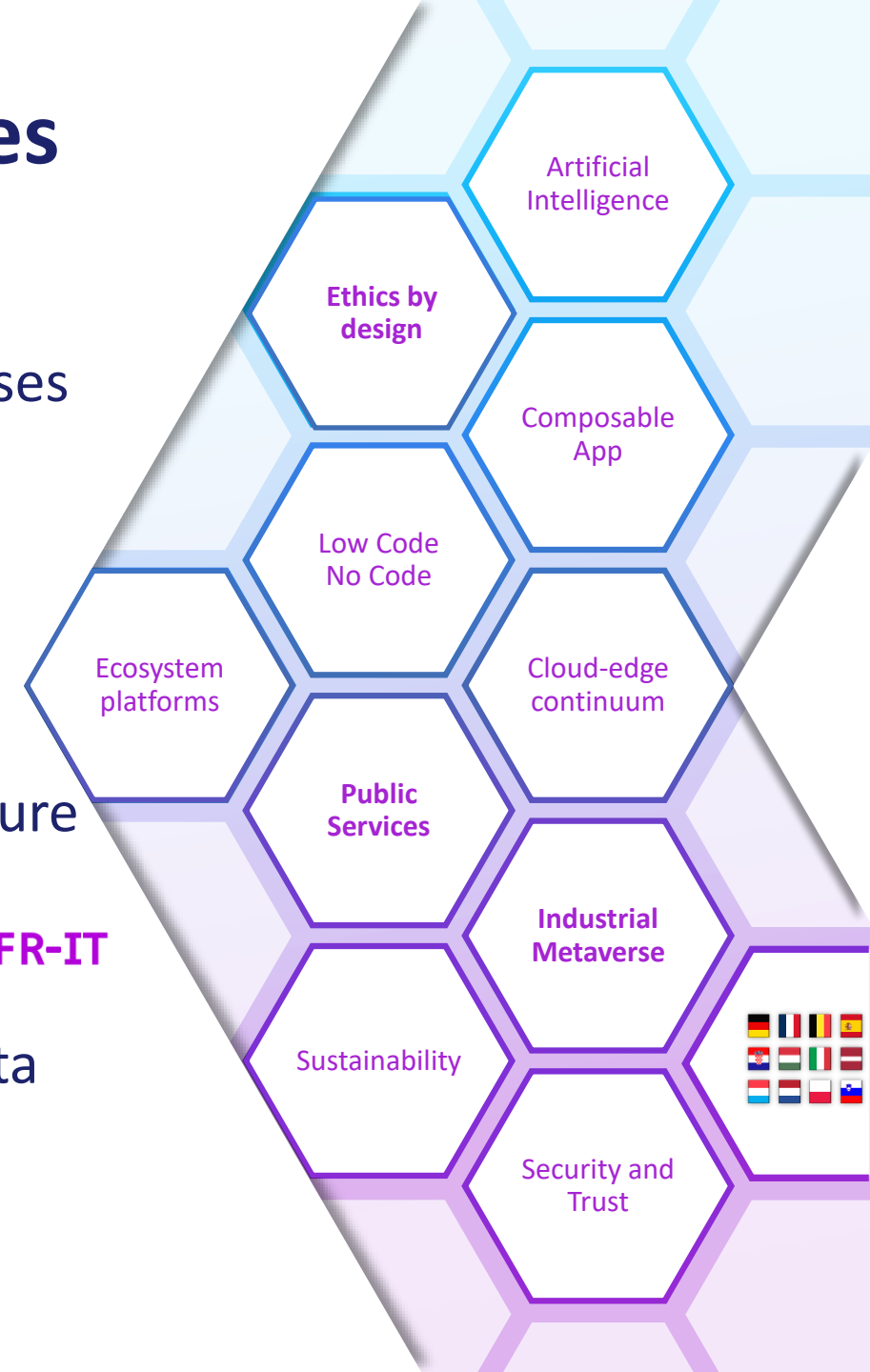
Tourism: personalized intelligent travel guide **ES**

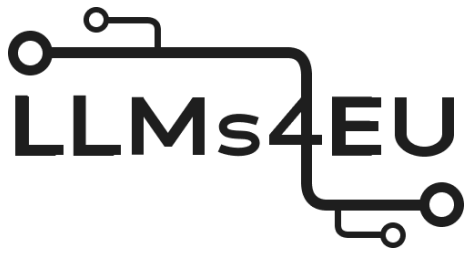
Legal: generation of legal documents with AI **IT**

Agriculture: AI support for personalized precision agriculture

Local Governance: AI-assisted (DXP) platform for citizens **FR-IT**

Business: Big Data Analytics and value extraction from data with Generative AI **DE**



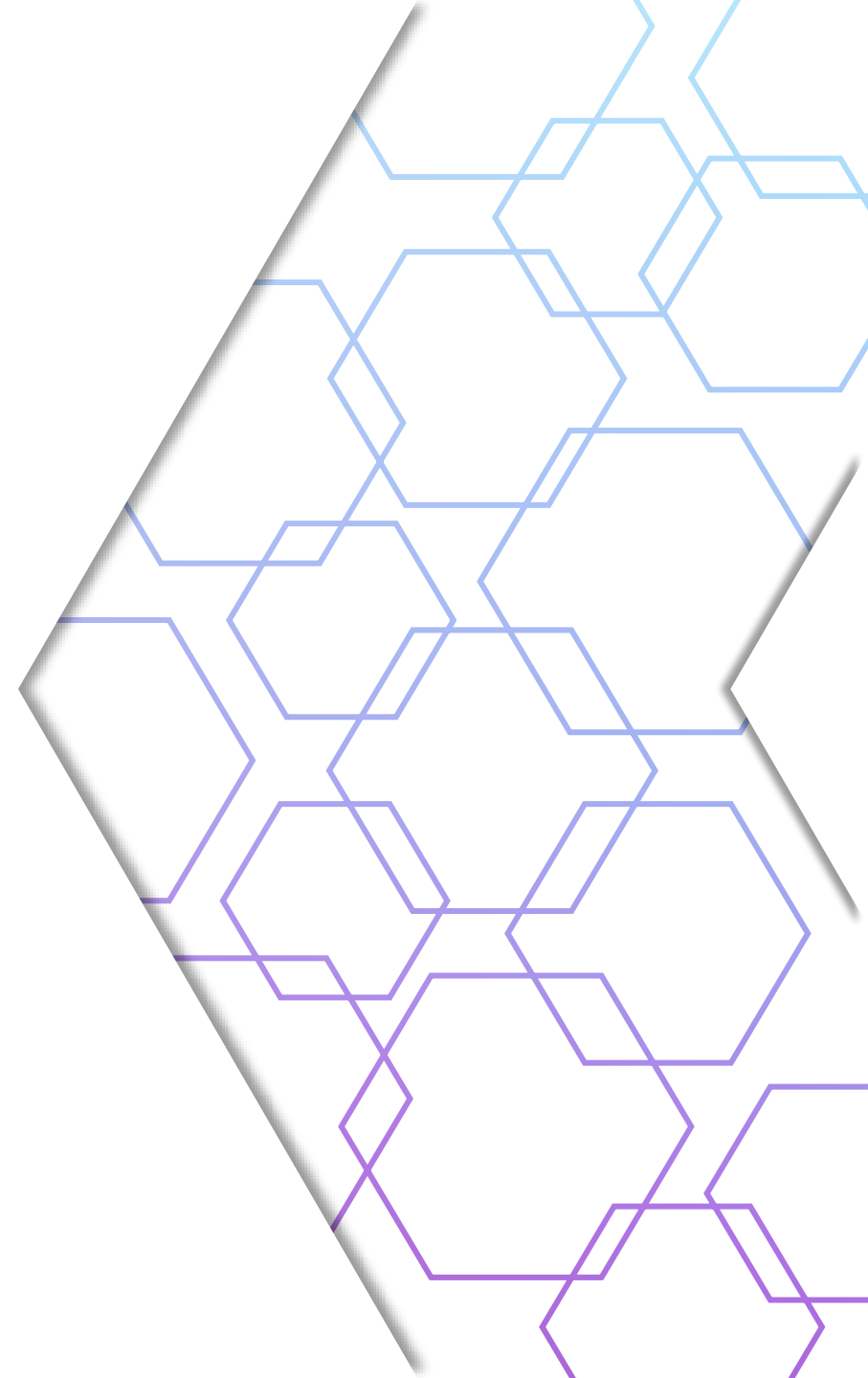


Purpose

- The project aims to preserve **European linguistic diversity** in the age of generative AI. Its main goal is to prevent European languages from being left behind in the development of language models.
- The project will achieve this by making Large Language Models (LLMs) and the tools needed to use them available as open data for all EU languages.
- This will help European companies, particularly SMEs, become more competitive in the market, which is currently dominated by American firms.
- The project will also ensure that these tools comply with European regulations like the AI Act and GDPR.

ALT-EDIC

- The Alliance for Language Technologies (ALT-EDIC) is the coordinator of the LLMs4EU project. It's a consortium of organizations from over 20 countries, ensuring wide geographical and linguistic coverage.



IPCEI-Health: Tech4Cure

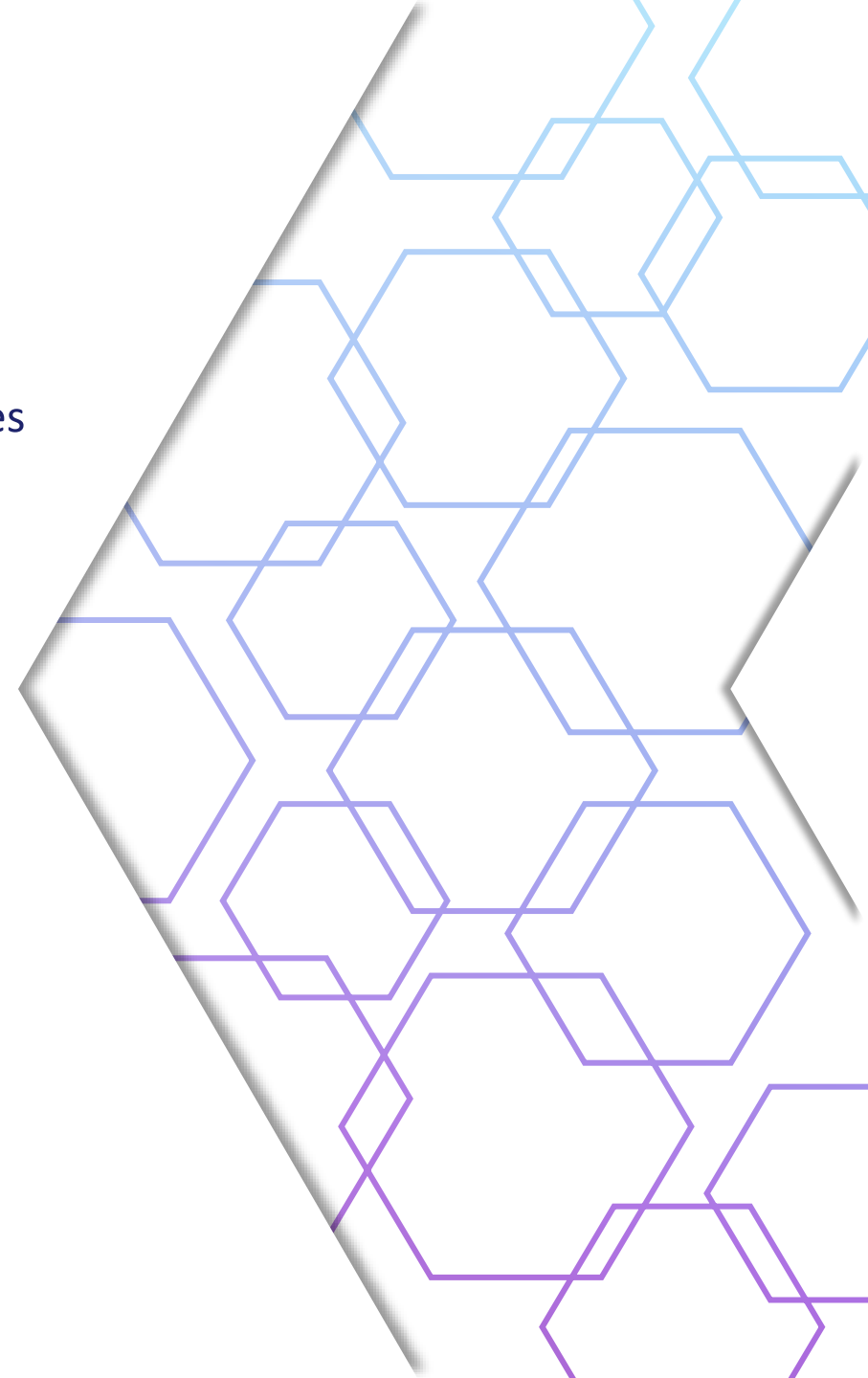
Purpose

Tech4Cure foresees activities aimed at creating innovative medical devices that leverage advanced digital/AI solutions to support the concept of predictive, preventive, and personalized medicine (**3P medicine**).

- Creation of an integrated technological platform for the collection and analysis of metabolomic and radiomic data.
- Development of modular, CE-marked tools for clinical analysis.
- Use of AI for data analysis.

Alliance

The project's proponent is Innovaway S.p.A. Several private and public partners support the project: IRCCS Fondazione Pascale, Tiscali, Marea (Univ. Federico II) and CNR; specialized partners ME.Di (Mediterranea Diagnostica s.r.l), Bruno Farmaceutici S.p.A., Istella, Mapacom S.r.l., RCS Laghi S.r.l., Unilink, and RI.PRE.SA Business Network.



IPCEI-CIS: Gateway to Horizon Opportunities

European Recognition

IPCEI-CIS is highlighted in Horizon calls as a strategic initiative to build synergies.

Access to Shared Platforms

Cloud-edge infrastructures, datasets, and outcomes already available to accelerate projects.

Enhanced Credibility

IPCEI demonstrates technical solidity and strategic vision, valued within consortia.

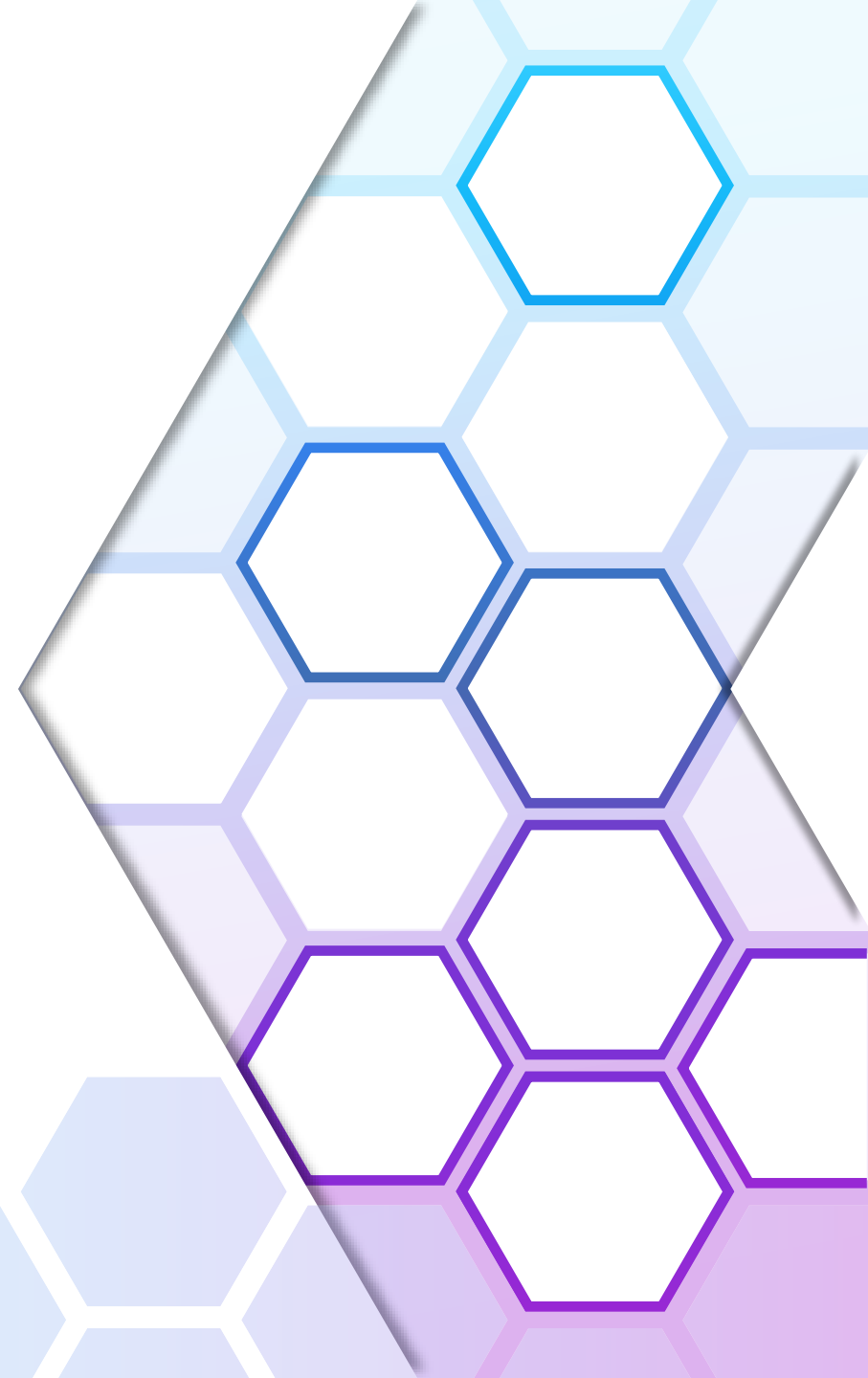
EU Alignment

Full coherence with Europe's goals of digital sovereignty, interoperability, and open source.

**IPCEI-CIS is the privileged gateway to Horizon.
Validated infrastructures, European network, EU strategy.**

Empowering Local Innovation

- When the core of your infrastructure is **open**, you lower the barrier for experimentation and extension.
- **Developers** can tailor components to specific domains, **research institutions** can adapt models for local languages or data types, and **startups** can build AI services without licensing barriers or opaque black-box dependencies that hinder their future growth.
- This isn't just a benefit, it's essential for Europe's ambition to build an **inclusive and sustainable AI ecosystem**.



Thank you!

