



AI FOR INDUSTRY

The Italian Institute of
Artificial Intelligence

Frontier AI A New Infrastructure for Growth

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Ministero delle Imprese
e del Made in Italy



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dell'Economia
e delle Finanze



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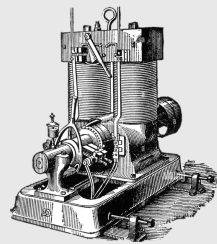


**DIPARTIMENTO
PER LA TRASFORMAZIONE
DIGITALE**

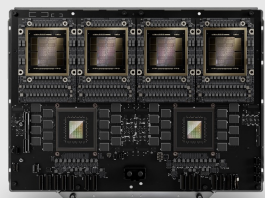
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AI as an enabling technology

compute, data, simulation, robotics, quality, supply chains and engineering workflows.



Edison Dynamo 1882



Nvidia GPU 2026

AI Inference

By 2030, inference will represent >70% of global AI Data Center capacity

¹ McKinsey Global Institute

Agentic AI

23% of organizations are actively scaling agentic AI in at least one business function, while an additional 39% are currently experimenting with it

² Nvidia

Vertical Solutions

Vertical AI spending is rapidly accelerating (~3x YoY), with healthcare accounting for nearly 50% of total investment

³ Gartner

Physical AI

The robotics sector raised a record \$40.7B in 2025 - up 74% YoY and 9% of all venture funding – driven by Physical AI

Examples

Dark Factories

- A **Dark Factory** (or lights-out factory) is a fully automated factory with no or very minimal human presence in routing operations.
- Figure AI's humanoid robots ran 10-hour production shifts at BMW Spartanburg in 2024-25 - the first publicly documented humanoid deployment on a live automotive assembly line

Magnets Rare Hearth Free

- Permanent magnets can now be found in over 80% of modern electric cars.
- The most powerful permanent magnets are produced using rare earths, 90% of which are controlled by China.
- **Materials Nexus** (UK) has generated, using AI and then synthesizing, a new powerful permanent magnet that does not require rare earths and costs about 20% of those currently on the market.

AI-native Software Companies

- YC reports startups with up to 95% AI-generated codebases.
- **Google** says AI already generates 25%+ of new code, reviewed by engineers.
- Human work shifts to architecture, testing, validation and product judgment.

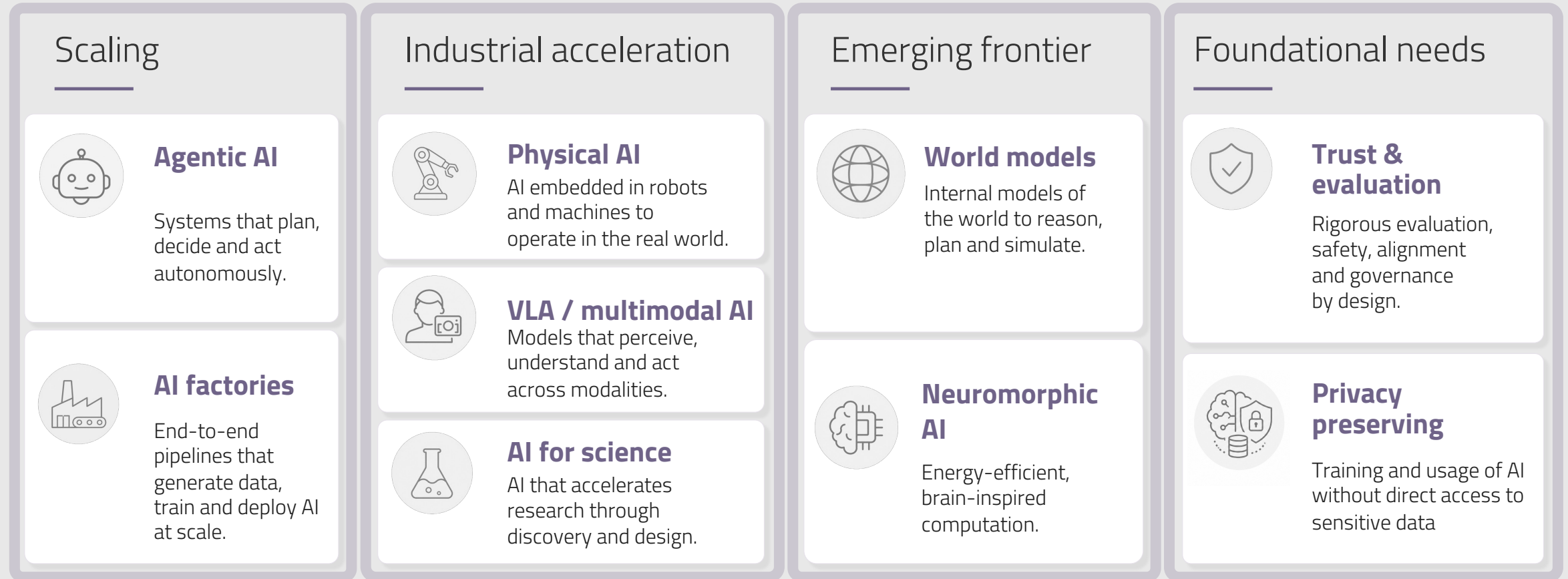
AI Agents

- **Klarna** is building a standardized product data system that allows AI agents to automatically find, compare, and recommend products
- **Mastercard** Agent Pay enables AI agents to securely complete purchases, optimize payments

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Beyond LLMs

Acting,
Perceiving,
Simulating (...)



From Models to Systems



What changes

- More action
- More real-world sensing
- More infrastructure



Why it matters

- Industrial productivity
- Robotics and automation
- Scientific discovery



Takeaway

- The frontier is broader than LLMs
- Execution depends on compute, data and evaluation

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AI Infrastructure Stack

AI infrastructure value does not reside in hardware alone: the complete software stack has become the reference standard and the prerequisite for any distributed architecture to function at scale, reducing unintegrated GPUs to a commodity

Source: Market Research; SlashData; MarketScreener; Silicon Analysts

Hardware & Software integration

SOFTWARE STACK

- Frameworks, libraries and runtime environments have converged into a **single integrated software stack** that the entire AI industry builds on
- As models, datasets and workflows accumulate on the same foundation, the **ecosystem compounds and the cost of switching grows with it**

HARDWARE

- **High-performance GPUs** have emerged as the **leading compute foundation for AI**, driven by processing architecture optimised for parallel computation at scale
- **Hardware fully integrated with the software stack** becomes a multiplier, unlocking the full value of AI model development and deployment

NVIDIA case study



Full integration approach

- NVIDIA's strategy is built on **vertical integration between hardware and software**, designing GPU architecture and the software ecosystem that runs on it as a single system
- **CUDA**, launched in 2006, **connects AI software to GPU hardware** and has generated over **two decades of ecosystem development**, now counting 4 million developers, 48 million toolkit downloads, 300 GPU-optimised libraries and 3,500 accelerated applications

Market share

- This integrated strategy has translated into **80-90% of the AI accelerator market by revenue**, making market share the outcome of vertical integration, not just hardware performance

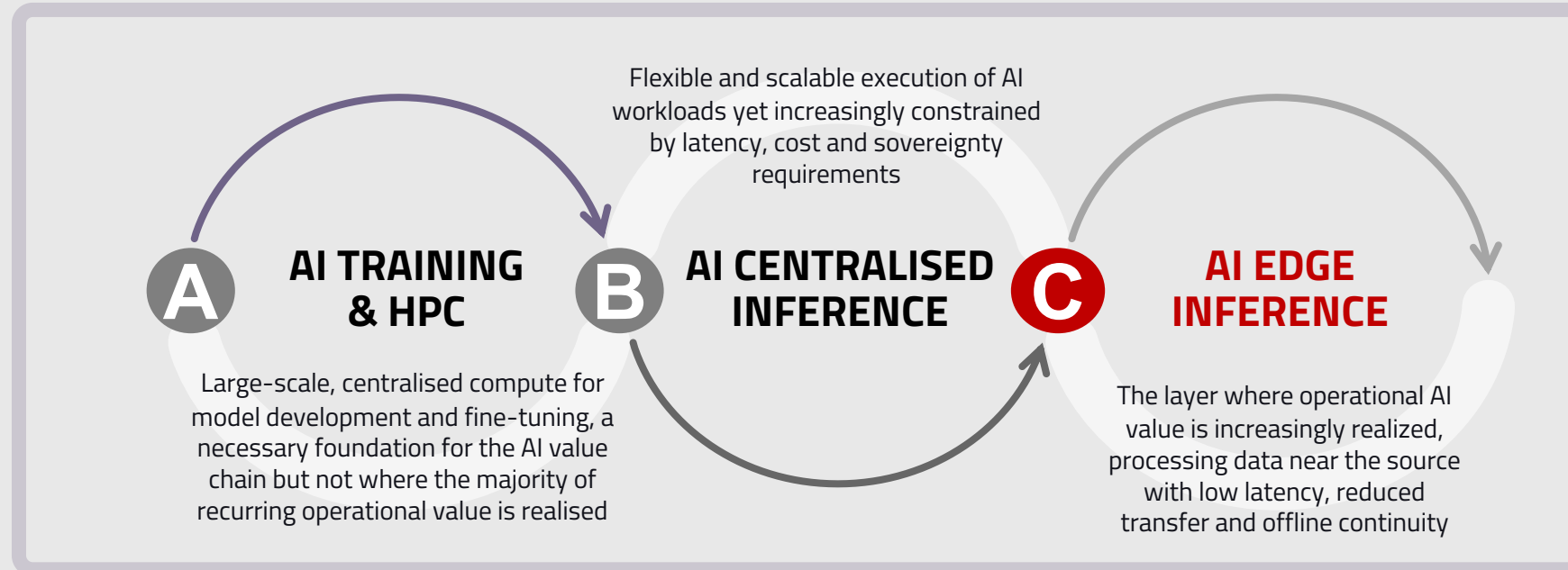
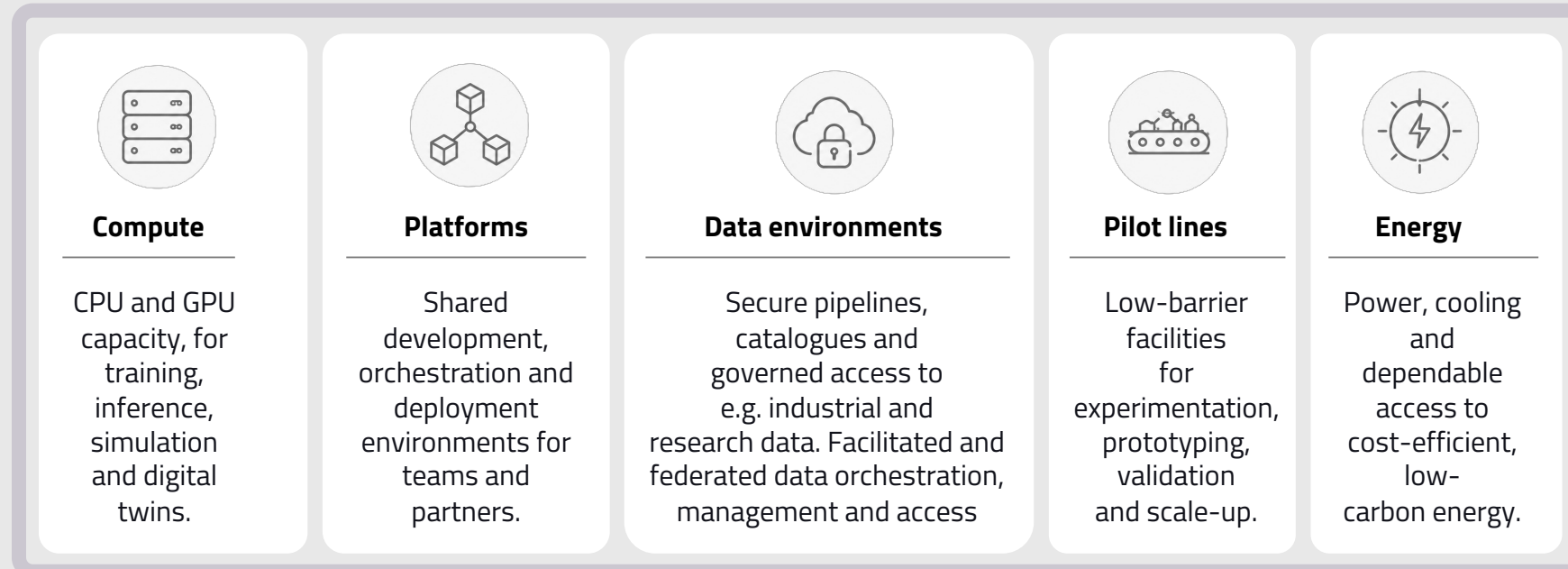
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Italy's Edge

Competitive frontier work depends less on isolated projects and more on shared enabling infrastructure

The AI value chain is shifting

Core Enabling Layers



Global Momentum

US: AI infrastructure is scaling in gigawatts

OpenAI said Stargate intends to invest \$500B over four years in US AI infrastructure, with \$100B to be deployed immediately;

US: power demand is surging now

S&P Global / 451 Research projected utility power serving hyperscale, leased and crypto-mining data centers to rise by 11.3 GW in 2025, reaching 61.8 GW.

Global: electricity demand is accelerating

The IEA said electricity demand from data centres rose 17% in 2025, with AI-focused facilities growing even faster.

UAE: AI campuses are being built at massive scale

The UAE-US AI campus announced in Abu Dhabi includes up to 5 GW of capacity for AI data centres, with an initial 1 GW phase.

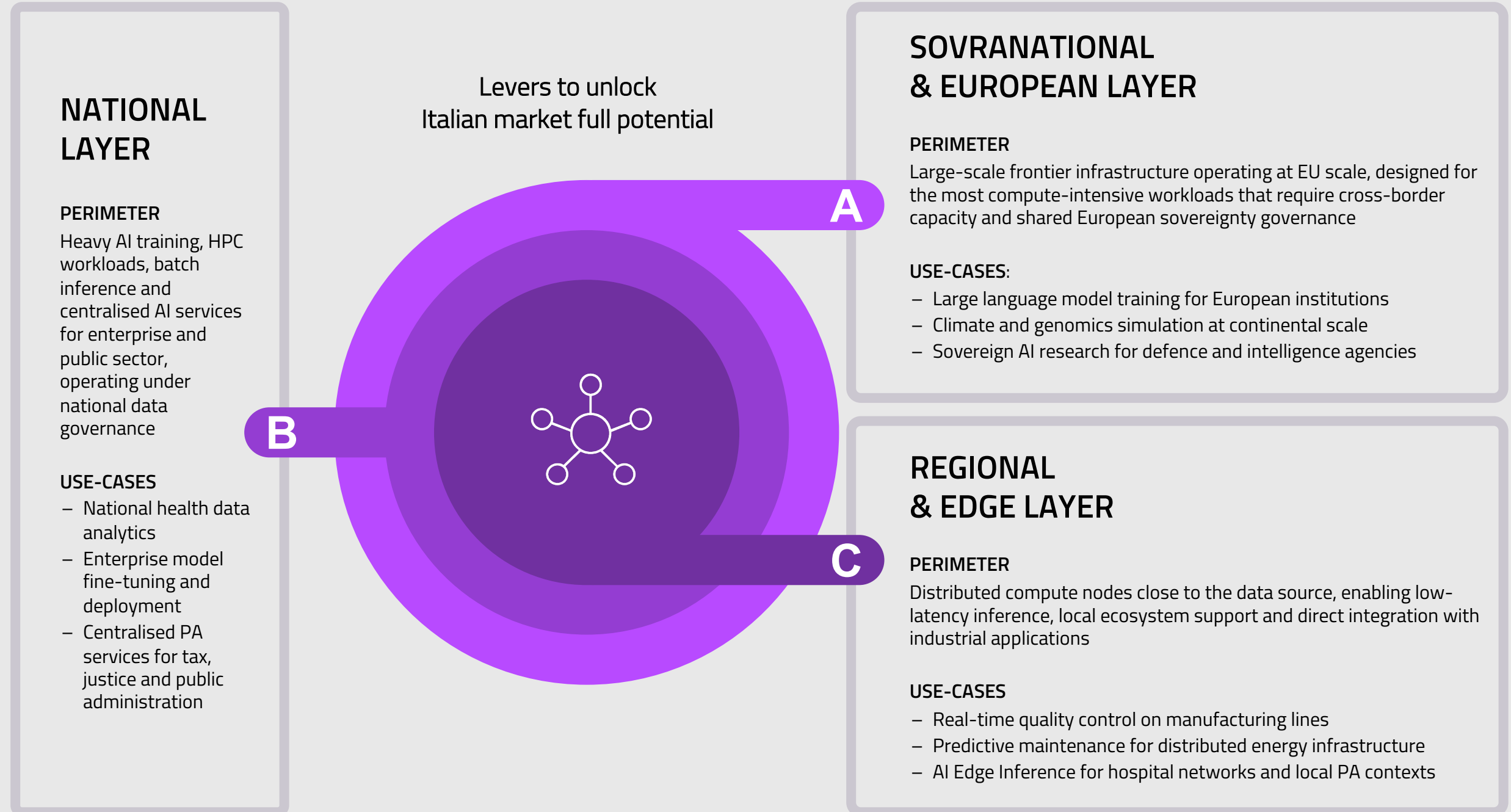
France: Europe is also moving at national scale

At the 2025 AI Action Summit, France announced more than €109B in AI-related infrastructure investments.

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Evolving AI tech paradigm

AI Infrastructure requires coordinated deployment across three distinct layers



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Italy's AI Opportunity

1.7B€ market with unrealized potential

Italy's AI market reached **~1.7B€ in 2025**, accounting only for ~2% of total Digital spend

~70%
of total AI spend



LARGE CORPORATES

~20%
of total AI spend



PUBLIC ADMIN.

<10%
of total AI spend



SMEs

Levers to unlock Italian market full potential



DISTRIBUTED AI AND EDGE INFERENCE

AI proximity to productive sites and SMEs and simpler provisioning enables usage at scale



UNLOCK UNSTRUCTURED KNOW-HOW / DATA ASSETS

Transform dormant Italian data moat / unstructured know-how into value via AI



VERTICAL APPLICATIONS

Develop AI systems tailored to productive and sector-specific processes



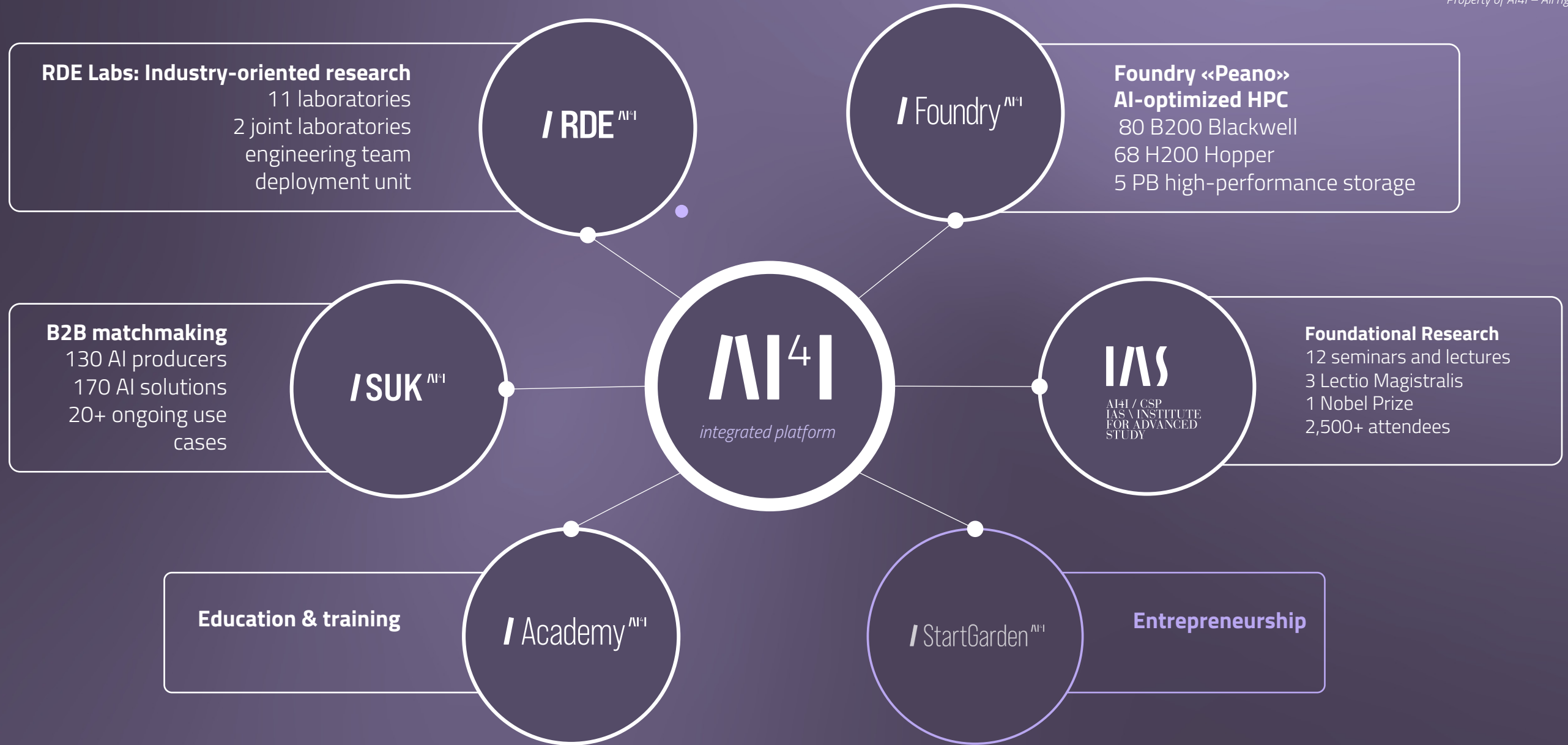
INVEST INTO HUMAN CAPITAL

Adoption barriers are not just tech, but also linked to talent strategy and organizations



CAPITAL INVESTMENT BOOST

Deployment of growth capital to really shift from piloting mode to full-scale value capture



Industry-oriented research

Engineering

AI-optimized HPC

B2B matchmaking

Foundational
research

Education & training

Entrepreneurship

/ RDE ^{AI4I}

RDE Labs are the core of AI4I. These teams collectively form AI4I research centre.

They conduct oriented and applied research and technology transfer thus supporting the advancement and the adoption of artificial intelligence.

/ AIS
AI Security

/ CRYPTO
Cryptography for AI System

/ AMED
Advanced Materials & Engineering Design

/ EIS
Edge AI & Intelligent Sensing

/ PHI
Physical Holistic Intelligence

/ IDEALS
Intelligent Development and Large-Scale Systems

/ RIAS
Robust and Intelligent Autonomous Systems

/ MAS
Multi-Agent Systems

/ AQUA
AI-based Software Quality Assurance

...

/ Foundry ^{AI4I}

Peano Hardware

**Peano Hardware
148 GPUs, Cloud Platform
and Enterprise Storage**

supporting both hot and cold tiers for day-to-day workloads.

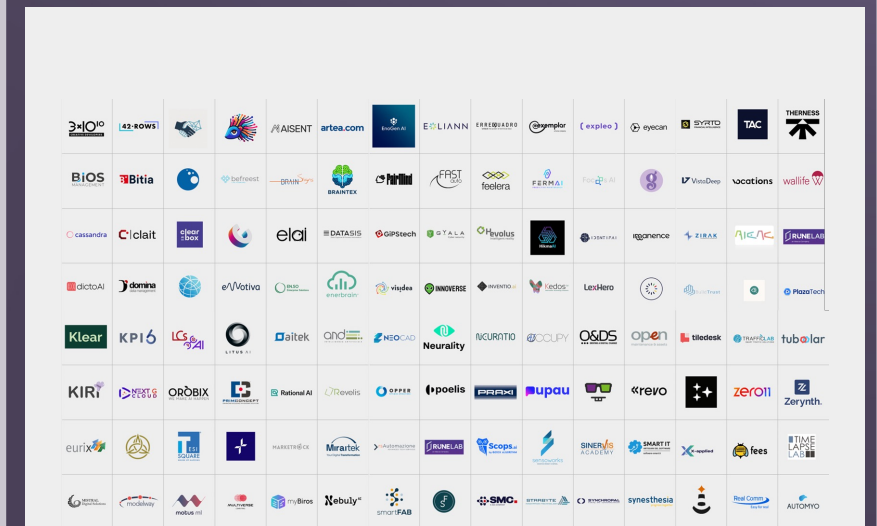


AI-generated image

/ SUK ^{AI4I}

**System User Knowledge
B2B Matchmaking**

More than 130 producers and 170 AI-based solutions for real world applications





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THANK YOU