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Lab as a Service

Using Intelligent Industry Lab to prototype at scale and de-risk industrial implementation

Antonio Jesús Jaramillo Mesa | **April 2026**

Intelligent Industry Labs

Global overview

The **Intelligent Industry Lab**, the place where **DIGITAL meets PHYSICAL** with the ambition to **innovate fast and at scale** and become your **digital partner to accelerate and de-risk large scale transformation projects**.

The Lab purpose can be summarized in the following detailed missions:

- **Emerging Technologies** Evaluator
- **Innovation at Scale** Platform
- **Testing partner** for Delivery

To achieve these missions, the core assets are:

- Multiskilled SQUADS
- Industrial Operations & Environment
- OT-IT-IoT Architecture
- Partners Eco system

IOT	IT/OT	DEVELOPMENT	HARDWARE	ROBOTICS
Microsoft Azure	SAP	Unity	KEYENCE	UNIVERSAL ROBOTS
aws	OPC FOUNDATION	TensorFlow	intel	FANUC ROBOTICS
	kafka	docker	OMRON	
	NATIONAL INSTRUMENTS	spring	NATIONAL INSTRUMENTS	
	RabbitMQ	ANGULAR	SIEMENS	
		python		

Intelligent Industry Labs

Global overview

Intelligent Industry Lab

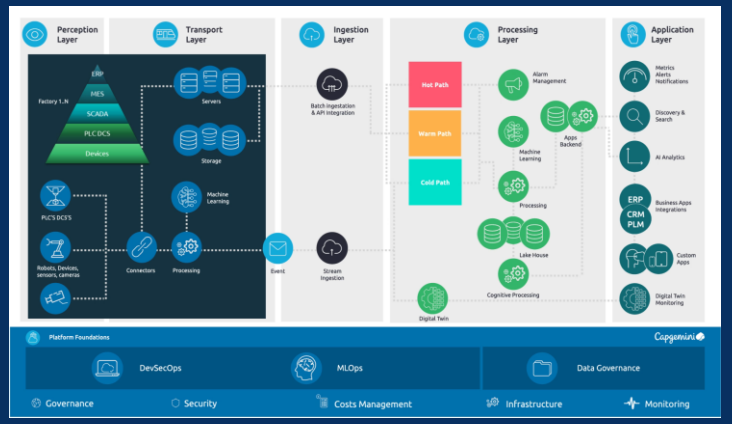
Our value – Lab as a service

INDUSTRY 4.0 LAB SQUAD

Our most important value is our team. We collaborate through a LAB SQUAD, a **squad of multi skill profiles**, gathering the **industrial domain expertise**, the **deep knowledge** on the required **industry 4.0 technologies** and more important with proven **hands-on experience on digital manufacturing solutions and full access to our lab facilities**

MODERN DATA ARCHITECTURE & INDUSTRIAL OPERATIONS

The I2LAB is equipped with a **future based looking OT-IoT architecture** allowing customers to **leverage the best of Edge and Cloud at once**. Moreover, it owns **real industrial operations** creating a reach industrial data environment. This is the core element of the lab as it allow us to test and validate the digital maturity of new industry 4.0 solutions

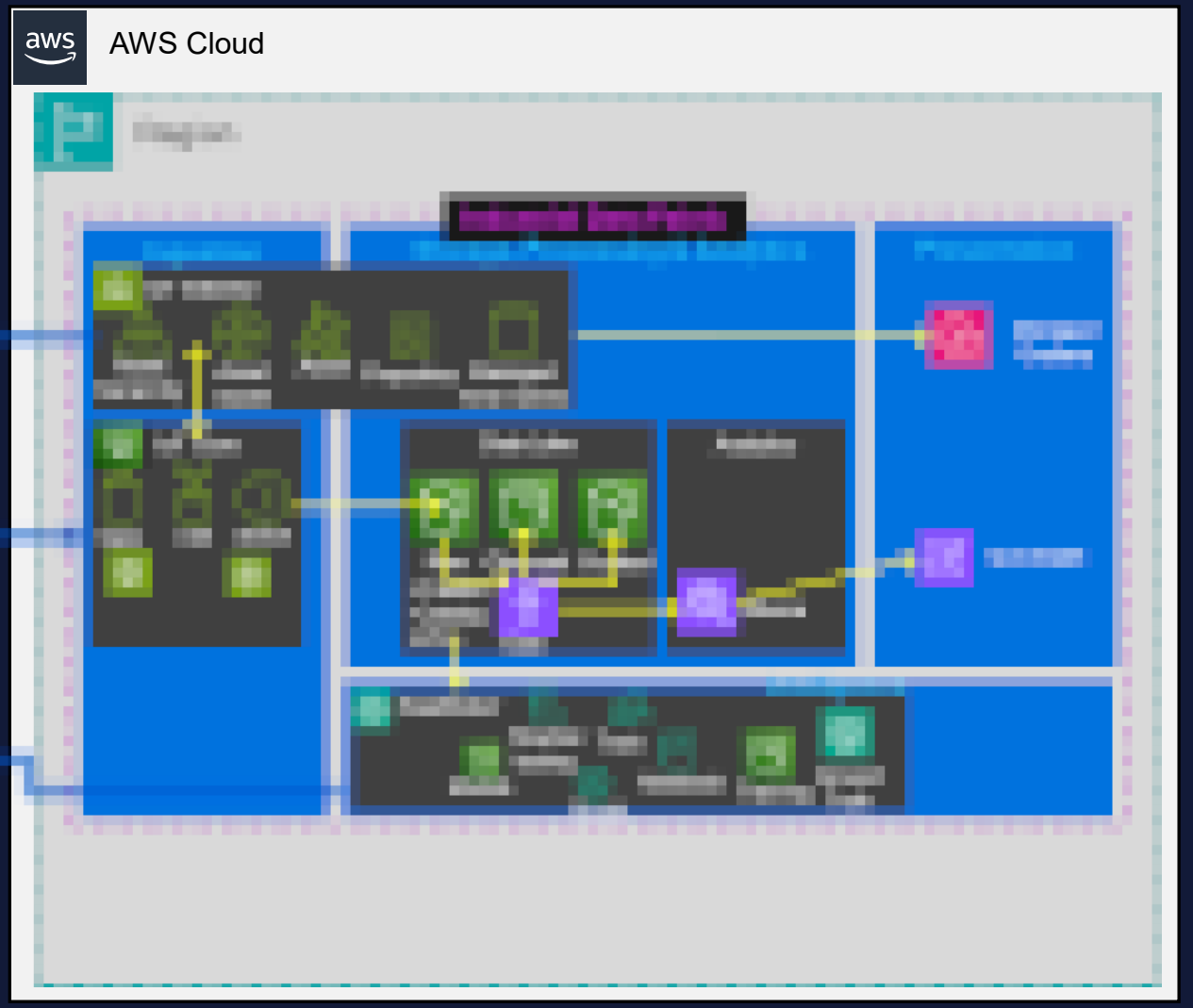


CUSTOM ASSETS & PARTNERS ECOSYSTEM

The I2LAB has created **more than 50 prebuilt solutions across the Digital Manufacturing spectrum** in areas like augmented operator, predictive operations, collaborative robotics and monitoring &control. Moreover, it has a **vast ecosystem combining the agility of start ups, the power of ISV and the support of hyperscalers**.

Global Architecture on AWS

Intelligent Industry Lab



Global Architecture on Azure

Capgemini engineering

Lab as a Service (LaaS)

REFERENCE – Integrating new technology & solutions

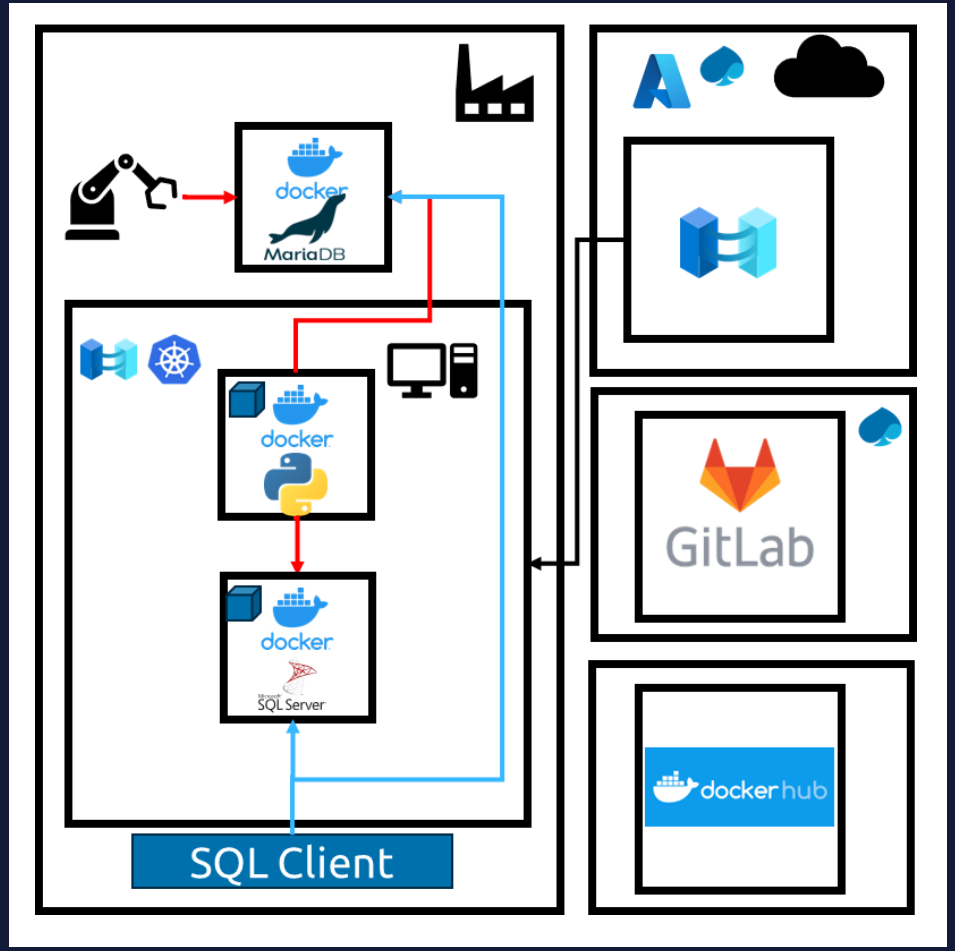
Thanks to the LAB SQUAD, a new Azure product has been evaluated, integrated and scaled in a 6 weeks' time unblocking a large OT-IoT implementation project.

Context

- A cosmetic manufacturing company is aiming to deploy a new OT-IoT solution to manage their shopfloor data, for this, they need to introduce a new MS Solution: **Azure IoT Operations**
- No hands-on experience on Azure IoT Arc exist in the company and we have used the Lab Squad to unblock in 6 weeks with a MVP to see how Infrastructure and software can be remotely deployed and managed in a realistic Industrial Environment through Azure Arc, it can be deployed and replicated in one or several target locations.

Benefits

- **Infrastructure as a code** from Lab resources.
- **Scalability and flexibility** in the IoT deployments.
- **Robust and security** in IoT deployments.



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Physical AI

April 2026

The big idea.

Future of industry is rooted in the transformative potential of Physical AI to enable the integration of autonomous polyfunctional robotics in environments operated by humans.

Physical AI* and polyfunctional robotics will be the foundation of industry 5.0

Physical AI is smashing the barriers of traditional robotics

From …	To …
Task Specialization Most robots are designed for narrow, predefined tasks (e.g., industrial arms for assembly). They lack flexibility to adapt to new tasks without extensive reprogramming or hardware changes.	**Polyfunctional robots** Today's robots design allows them to adapt easily to human environments, use existing tools, and perform a wide range of tasks in industrial and hazardous settings.
Limited use cases Robots struggle in unstructured or dynamic environments. Mobility in complex terrains (stairs, uneven surfaces) remains a challenge.	**Unlimited business impact** Robots become general-purpose assistants rather than single-task machines. They mimic human form and behavior, making interaction intuitive through gestures, speech, and facial expressions.

**Physical AI refers to autonomous, context-aware AI agents embedded in robots that navigate and adapt in the real world, able to perform diverse tasks. Advances in the integration of AI, the rise of autonomous agents and rapid innovation in robotics are accelerating the convergence of the physical and digital worlds.*

The integration of Physical AI in industrial sectors such as manufacturing, CPG or energy & utilities is a major technological revolution that is reshaping operational processes, economic models, and working conditions.

Telepresence & Remote Operations

Remote human presence via a humanoid body lets operators control the robot (live audio/video + actuated limbs) to see, walk, and manipulate in human-designed environments.

Material Handling & Transport

Humanoids move items, packages, and equipment within facilities, navigating stairs, elevators, and narrow aisles where traditional systems fall short.

Pick & Place

Robotic systems pick items from bins or shelves and place them into boxes, kits, or onto conveyors, supporting warehousing, manufacturing, and retail backrooms.

Inspection & Monitoring

Humanoids can patrol plants, platforms, warehouses, and stores to read gauges, scan shelves, detect heat, leaks, or abnormal vibrations, and flag hazards.

Hazardous & Unmanned Operations

Humanoids serve as first responders in fires, chemical spills, radiation zones, and other high-risk environments. They operate where human presence is unsafe or impractical.

Assembly & Precision Task

Humanoids handle complex tasks requiring dexterity, force control, and standard tool use in flexible production lines.

Initial projects and existing research on the subject demonstrate substantial benefits for companies:

Quantitative Improvements

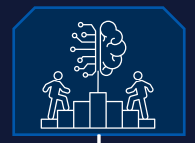
- Reduction in labor costs by 30%
- Productivity increases ranging from 20% to 40%
- Return on investment achieved within 12 to 24 months

Qualitative Improvements

- Strengthened security
- Increased operational flexibility
- Elevated employee satisfaction levels

Sources for quantitative improvements: Morgan Stanley, 240626-Humanoid-Robots-Morgan-Stanley.pdf, 2024. Mckinsey, the-next-big-arenas-of-competition, 2024. Mantec.org, robotics-on-the-line-simple-roi-calculator-adoption-roadmap, 2025

But navigating the technological and business transformation is challenging!



Business Value is Uncertain

*We want to unlock **real business value** from these technologies, turning it into a **competitive advantage***

- *How will robotics and AI improve our **operational efficiency** and reduce costs?*
- *This is a brand-new technology > Is it for me ? How do I know the **right use cases** ?*
- *How do we **prioritize use cases** for robotics?*
- *How do we **future-proof** our fleet for **evolving business needs?***

Technology is Emerging & Complex

*As an **early adopter**, we are struggling to **navigate products, technologies** and integrative architectures*

- *There is a wealth of robot offering… **Where do I start**? Which robot to **choose**?*
- *Which AI robotic stack should I **select**? How can I **adapt** the stack to my use-case?*
- *Collaboration between robots & human is **operationally complex** and **safety-critical***
- *How to **supervize operations** and at the same time **secure efficiency** ?*
- *What **technological expertise** do I need to leverage to build robotics?*

Path to Value & Adoption is Hazardous

*As early adopters, we do not know **how to start** and **implement** this this transformation **at scale***

- *How do we **scale-up** from pilot to full deployment? Multi site?*
- *How to secure **safety and regulatory compliance** in a hybrid human – robot work environment.*
- *How do I **implement the change** in my operations?*
- *How do we **prepare our workforce** for robotics adoption?*

To succeed …

Business Value is Uncertain

*You want to unlock **real business value** from these technologies, turning it into a **competitive advantage***

A Strategy is Essential…

Physical AI Strategy (Integration In Business) | **Business Case With Proven Business Impact**

- Identification of the business opportunities
- Selection of the right set of use cases
- Building a Maturity model & a Business Roadmap towards quantified value across transformed industrial processes

Technology is Emerging & Complex

*As an **early adopter**, you are struggling to **navigate products, technologies** and integrative **architectures***

…supported by a Tech Vision…

Digital Cockpit | **Physical AI Reference Architecture**

- Selection of the right robot
- Development/Implementation of first use cases that bring value
- Development of the right AI stack
- Polyfunctional robots integration
- Fleet orchestration to manage Operations at scale
- Integration in a Supervised hybrid robotic system

Path to Value & Adoption is Hazardous

*As early adopters, you do not know **how to start** and **implement** this this transformation **at scale***

…and a Robust Execution.

Cyber And Safety Policies | **Change Management** | **Development & Deployment Roadmap**

- Progressive journey from discover to scale
- Strategy implementation (roadmap execution)
- Business value monitoring
- Skilling and cultural adoption
- Ensure regulations compliance

AIREX Lab

orano

[Press Release](), [LinkedIn]()

ENERGY & UTILITIES

Technology	Services	Type	Confidentiality
Robotics	Intelligent Industry	CLIENT	EXTERNAL

Intelligent Humanoid Robotics to Support Safety Critical Operations in Nuclear Industry

Summary:

Capgemini as a strategic partner to Orano deployed an advanced humanoid robot, “Hoxo,” led by AI Robotics & Experiences Lab to address complex challenges within nuclear facilities. This initiative leverages physical AI and robotics to perform complex tasks in high-risk environments.

Challenges:

- Human intervention in the nuclear zone poses safety risks and required automated human assistance
- Nuclear environments demand precision and strict safety compliance
- Transitioning from prototype to operational deployment required robust validation and governance

Approach:

- Developed a modular, scalable robotics platform tailored for nuclear operations
- Designed intuitive, human-like interfaces for seamless collaboration with operators
- Integrated AI, computer vision, autonomous navigation, and digital twin technologies for situational awareness and control

Solution:

- Delivered “Hoxo,” an ergonomic humanoid robot with embedded AI and multi-modal sensors
- Enabled real-time perception, autonomous mobility, and dexterous manipulation
- Ensured safe, autonomous execution of complex technical procedures with natural human-robot interaction

Outcome:

- Set a new benchmark for AI-powered robotics in high-risk industrial environments
- Addressed Orano’s most critical operational challenges with enhanced safety and efficiency
- Paved the way for broader adoption of physical AI to augment human capabilities in hazardous settings

2025 | EUROPE | PHYSICAL AI

Highlights

First-of-its-kind humanoid robot deployed in the nuclear sector

Combines physical AI, robotics, and digital twin technology for precision tasks

Opens pathways for scalable automation and long-term innovation in high-risk industries

Global retailer

Technology	Service / Industry	Type	Confidentiality
AI Robotics	CPRD	CLIENT	CONFIDENTIAL

Humanoid Robotics to safely automate retail warehouse and *Click & Collect* operations for enhanced efficiency, employee & customer satisfaction

Capgemini as a strategic partner to define and test a scalable autonomous robotic solution to enhance Click & Collect and Warehouse Pick & Place operations, starting with controlled pilots before extending to multiple store environments. A combined approach mixing consulting and engineering expertise to secure feasibility, acceptance, and operational fit.

Challenges:

- Achieving full automation of warehouse operations is a major challenge for the retail industry as it strives to improve operational efficiency.
- The Click & Collect operation has become a strategic differentiator across retailers' (omnichannel) strategies.
- However, these processes rely heavily on manual handling, which introduces variability in quality, timing, and operator safety, while also being repetitive, time-consuming, and unsafe.

Approach:

Each phase will consolidate both technical maturity (AI, perception, manipulation) and operational acceptance.

- Analysis of operational and logistical requirements for outdoor environments.
- Progressive development from basic pick-and-place to full vehicle interaction.
- Controlled pilots to validate technical feasibility, reliability, and safety.
- Integration with existing digital and logistics systems

Solution:

- **Safety & Reliability:** Guarantee secure robot-to-vehicle interaction and product handling.
- **Scalability:** Build a reusable architecture adaptable to other delivery formats or sites
- **Continuous Improvement:** Incorporate operator and logistics feedback to refine robot behaviour and performance.

Key Benefits

Ensuring operational continuity by reducing out-of-stock situations and securing product availability through robots that provide constant monitoring.

Enhanced Team Efficiency & productivity by freeing up time from repetitive and time-consuming tasks to focus on critical missions

Increased reliability and anticipation through real-time visibility of shelf conditions and anticipation of restocking actions.

CPRD

2025 | EUROPE | PHYSICAL AI

WE HAVE THE ROBOTS

Physical AI represents a key investment area for Capgemini in our innovation lab. We have developed deep expertise, positioning us as a long-term partner.

WE HAVE THE PARTNERS

To stay at the forefront of innovation, Capgemini has established partnerships with key industry players such as Nvidia, Gemini Robotics, and leading robots' manufacturers.

WE BOOST BUSINESS IMPACT

Our unique blend of business strategy, industry know-how, tech expertise and change management creates measurable impact for our clients. We track the value created.

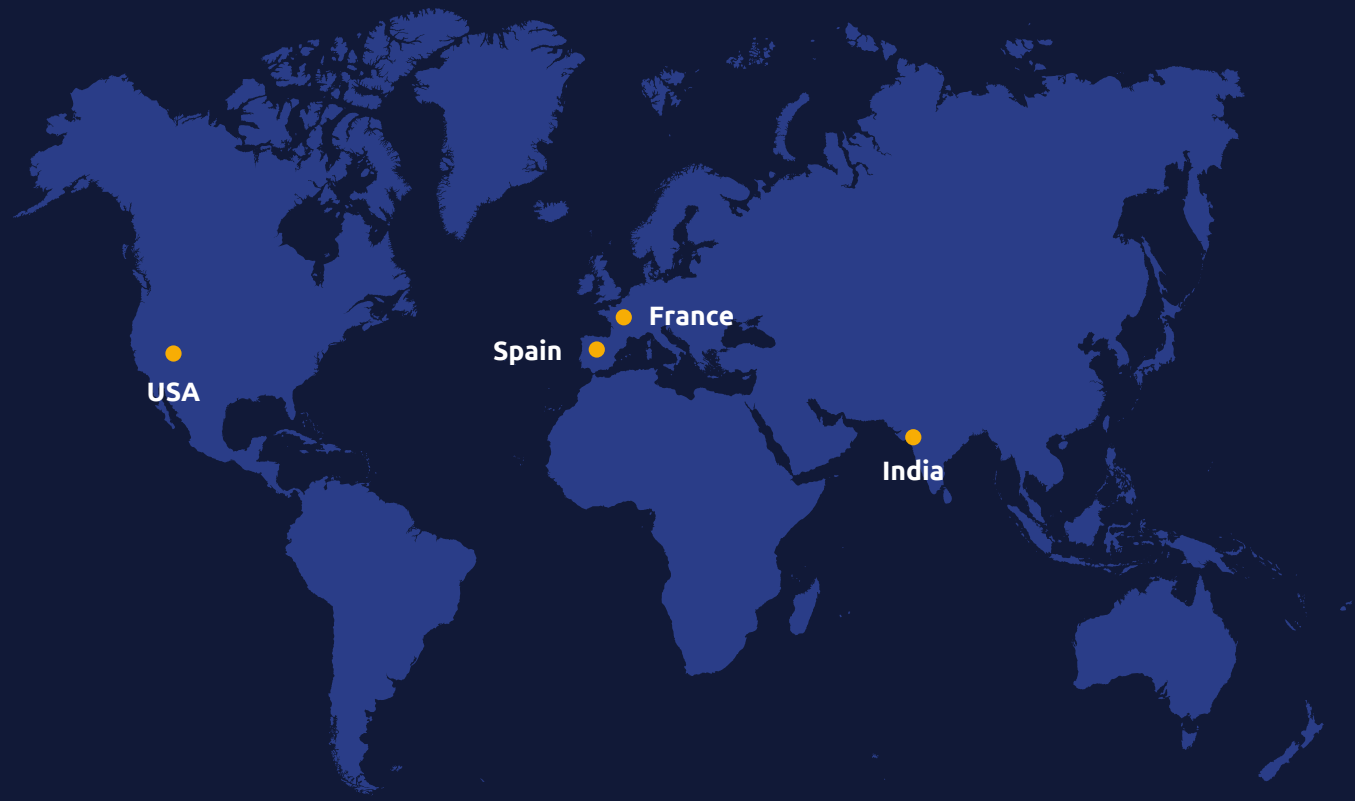
WE HAVE THE TECHNOLOGY

Capgemini enhances and develops new assets across all stacks and components. We are platform-agnostic. Cybersecurity and safety are fundamental pillars at the heart of every polyfunctional robotics project.

WE SUPPORT END-TO-END

Capgemini possesses the complete spectrum of industry and tech expertise: from initial robot configuration to full-scale deployment and change management.

Today, Capgemini is at the forefront of the industry, having initiated efforts early to drive the operational transformations of our clients.



Visit our Lab and experiment the Physical AI revolution!

Experts

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Let's connect!

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Let's connect!

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Thank you.

Make it real.