

PHYSICAL AI TECHNOLOGY, IP & ECOSYSTEM LANDSCAPE



Cross-sector technology convergence, patent intelligence and standardisation opportunities

INAUGURAL REPORT - OCTOBER 2026

Mapping innovation ecosystems, technology positioning and emerging interoperability challenges in Physical AI.

WHY THIS REPORT MATTERS

Physical AI brings artificial intelligence into interaction with the physical world through robotics, autonomous systems, sensing and control. As these technologies converge across industries, organisations face increasingly interconnected questions about innovation, intellectual property, interoperability and technical assurance.

The COBELTY study combines cross-sector technology analysis, patent intelligence and standardisation foresight to provide a structured view of the emerging Physical AI landscape. It helps decision-makers understand regional innovation dynamics, identify relevant technology stakeholders and investigate potential interoperability challenges.

THREE QUESTIONS FOR DECISION-MAKERS

Where is patent activity concentrated?

Compare geographic ecosystems, ownership structures, leading patent stakeholders and international protection strategies.

Which capabilities are attracting patenting activity?

Explore patenting activity across seven non-exclusive technology categories and identify potential horizontal and sector-specific stakeholders.

Where could cross-sector interoperability create future standardisation opportunities?

Examine shared technological foundations, potential interoperability interfaces and priorities for further investigation.

Selected findings only. The full report contains detailed analysis, supporting evidence, strategic interpretation and methodological annexes.

01 / SELECTED EVIDENCE

Five ecosystems. Different patent dynamics.

The study finds that regional Physical AI patent landscapes differ not only in volume, but also in ownership concentration, institutional participation and international protection strategies.

ECOSYSTEM	SELECTED CHARACTERISTIC
China	Broad network of industrial applicants, universities and public research institutions.
United States	Diversified participation across automotive, digital technologies, AI and industrial systems.
Japan / South Korea	More concentrated patent portfolios led by major industrial groups.
Europe	Strong industrial patenting activity in automotive engineering and advanced manufacturing.

SELECTED QUANTITATIVE FINDINGS

TWO ECOSYSTEMS. TWO DISTINCT PATENT DYNAMICS.

CHINA – Research institutions among leading assignees

14 of China's **20** leading Physical AI patent assignees are academic or public research organisations.

JAPAN – Highly concentrated patent portfolios

The **Top 10** assignees account for **73.4%** of Japan's attributed Physical AI patent families, with Toyota Motor and Honda Motor together accounting for **39.5%** of these attributed families.

These findings illustrate distinct structural characteristics of regional Physical AI patent landscapes, highlighting differences in institutional participation and portfolio concentration. They also underline the importance of examining patent ownership and leading stakeholders beyond aggregate filing volumes.

WHAT THE FULL REPORT ADDS

Regional comparisons, portfolio concentration metrics, leading patent stakeholder analysis and international protection patterns – interpreted together rather than through patent counts alone.

02 / TECHNOLOGY & STANDARDISATION

From technology convergence to interoperability.

As Physical AI technologies converge across industries, interoperability questions increasingly extend beyond individual systems or sectors. The report structures these questions around three interconnected domains, providing a framework for investigating emerging technical interfaces and potential future standardisation priorities.

M1	Physical-System Interoperability Sensing, perception, navigation, control and physical interaction.
M2	AI & Agent Interoperability AI-driven decision-making, embodied intelligence and multi-agent coordination.
M3	Digital Representations & Simulation Digital twins, world models, simulation and sim-to-real capabilities.

WHERE INTEROPERABILITY QUESTIONS EMERGE

M1 ↔ M2	Physical systems and AI agents Distributed perception, shared semantics and AI-to-physical execution interfaces.
M1 ↔ M3	Physical systems and digital representations Semantic and spatiotemporal alignment between sensed environments and digital world representations.
M2 ↔ M3	AI agents and digital representations AI-readable world models and interfaces connecting simulation, reasoning and decision-making.

Connectivity, distributed computing and the UE–Edge–Cloud continuum provide cross-cutting technological foundations.

FROM INVESTIGATION TO STANDARDISATION

The full report outlines a structured approach to examining existing standards and technical frameworks, assessing potential interoperability gaps and identifying areas where further standardisation investigation may be warranted.

03 / THE FULL REPORT

Turn selected signals into a structured strategic view.

The complete 112-page COBELTY report brings together patent landscape analysis, technology positioning and cross-sector interoperability perspectives in a single structured intelligence resource.

Designed for IP, innovation, strategy and standardisation professionals, it provides the evidence, analytical frameworks and comparative insights needed to support further strategic assessment of the evolving Physical AI ecosystem.

INSIDE THE FULL REPORT

Global and regional patent landscapes

Major patent stakeholders, ownership structures, portfolio concentration, geographic protection patterns and regional innovation dynamics.

Technology positioning and cross-sector convergence

Seven analytical patent categories, technology-specific patent signals and common capabilities across Physical AI applications.

Interoperability and standardisation perspectives

Three strategic investigation domains, cross-domain interfaces, potential technical challenges and a structured roadmap for assessing existing standards and possible gaps.

Transparent research boundaries

Search and classification approach, counting and consolidation rules, technology coverage, data limitations and boundaries of interpretation.

DISCOVER THE FULL REPORT

Explore the complete 112-page Physical AI landscape.

Contact COBELTY to request the detailed table of contents, discuss the report's scope or receive pricing and licensing information.

contact@cobelty.com

Research note: Based on a defined patent search and classification methodology using LexisNexis IPlytics data extracted in October 2026. Patent coverage is not exhaustive. Technology classification is non-exclusive and relies substantially on patent titles and abstracts. The report provides strategic intelligence and research analysis. It does not constitute legal advice, a freedom-to-operate assessment or a determination of standards-essential patent status.

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04 / COBELTY INTELLIGENCE REPORTS

ABOUT THE SERIES

COBELTY Intelligence Reports is a quarterly research publication series exploring emerging technologies, patent landscapes, innovation ecosystems and standardisation perspectives.

Each edition investigates a new technology domain or revisits a previously covered topic to examine its evolution.

ABOUT COBELTY

COBELTY combines strategic intelligence, operational support and capability development to help organisations navigate emerging technologies, intellectual property and standardisation challenges – from informed decision-making to implementation and organisational autonomy.

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contact@cobelty.com