

Artificial Intelligence In Robotics - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-07-01 | 120 pages | Mordor Intelligence

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Report description:

Artificial Intelligence In Robotics Market Analysis

The Artificial Intelligence In Robotics Market size is estimated at USD 25.02 billion in 2025, and is expected to reach USD 126.13 billion by 2030, at a CAGR of 13.10% during the forecast period (2025-2030).

Momentum is underpinned by rapid advances in edge computing, machine learning algorithms, and high-resolution sensor suites that allow robots to interpret their surroundings and act autonomously in milliseconds. Manufacturers are shifting from purely mechanical upgrades to intelligence-centric improvements, embedding custom AI processor modules that shorten decision latency on production lines and in service environments. Asia's manufacturing investments, North America's e-commerce boom, and Europe's coordinated research programs are converging to expand deployment scenarios and accelerate time-to-value. Hardware remains a large cost driver, yet rising software attach rates illustrate how value creation is migrating toward perception, reasoning, and adaptive control stacks, turning robots into continuously learning assets within connected factory and logistics ecosystems. The combined effect of these trends is creating an ever-larger installed base of intelligent machines that complement, rather than displace, human operators, widening addressable demand for the AI in robotics market.

Global Artificial Intelligence In Robotics Market Trends and Insights

Integration of Edge-AI Chips Enabling Real-Time Robot Decision-Making

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Edge-AI processors cut decision-making latency from seconds to milliseconds, enabling autonomous mobile robots (AMR) to navigate dynamic production floors without cloud dependence. Advantech's 2025 showcase highlighted 75% faster response times after integrating NVIDIA Jetson Thor modules into AMR fleets. Electronics manufacturers in Shenzhen and Suwon report measurable gains in first-pass yield and takt-time reduction when vision and motion data are processed locally. Lower latency also tightens feedback loops for predictive maintenance, decreasing unscheduled downtime in precision assembly lines. As edge-optimized AI models mature, processor costs are falling, encouraging mid-tier suppliers to retrofit existing robots instead of purchasing new units. The driver, therefore, widens adoption across diverse factory footprints and contributes positively to the AI in robotics market .

Rapid Aging Population Accelerating Demand for Elder-Care Robots

Japan's share of residents aged 65 plus exceeded 29% in 2025, amplifying a projected shortfall of 377,000 caregivers. Panasonic, SoftBank, and startups backed by the Japanese government are rolling out mobility and social-companion robots that use deep neural networks to detect falls, remind medication schedules, and interact through natural speech. Clinical pilots show robots increase staff efficiency by reallocating repetitive lifting or monitoring tasks, letting nurses focus on direct patient engagement. South Korea faces similar demographic headwinds and is investing in AI robotic caregivers through its "Robot Industry Vision 2030" plan, which subsidizes hospital deployments and homecare trials. Success in these two cultural early adopters sets benchmarks for healthcare providers in Europe as their populations age, broadening future addressable demand for AI in the robotics market.

Scarcity of High-Quality Domain Data for Niche Robot-Perception Tasks

Frontiers in Robotics and AI highlights that inconsistent, incomplete datasets reduce the reliability of human-robot collaboration, especially where robots must recognize uncommon objects. For example, agricultural harvesters struggle to gauge ripeness across diverse crop varieties, limiting commercial deployment beyond pilot farms. Data gaps also impede safety validation, forcing vendors to over-engineer perception stacks and prolong time-to-market. Proprietary datasets give large incumbents a moat, making it harder for smaller innovators to match performance benchmarks. While synthetic data generation and transfer learning mitigate the barrier, the shortage remains a drag on the overall expansion of AI in the robotics market.

Other drivers and restraints analyzed in the detailed report include:

EU Horizon Europe Funding Streamlining Collaborative AI-Robot Research / E-Commerce Fulfilment Boom Driving AI-Enabled Warehouse Automation / Fragmented Safety Standards Hindering Cross-Border Cobot Deployment /

For complete list of drivers and restraints, kindly check the Table Of Contents.

Segment Analysis

Hardware accounted for 62% of the AI in robotics market share in 2024, reflecting the sensors, actuators, drives, and structural frames that give robots their physical presence. Capital-intensive industrial arms with integrated force-torque sensors remain indispensable for welding, painting, and precision material handling. Vendors are now shipping modular designs that let manufacturers swap grippers, cameras, or AI edge modules without full system overhauls, lowering total cost of ownership and prolonging equipment life cycles. Hardware roadmaps emphasize power-efficient servo controllers and lightweight composite joints, enabling higher payload-to-weight ratios crucial for mobile robots in tight factory aisles.

Machine Learning & Deep Learning software is expanding at a 24% CAGR and is increasingly bundled as pre-trained perception and motion-planning libraries. These stacks extract more value from existing machines by enabling defect detection, predictive

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maintenance, and adaptive grasping without external programming. Early adopters report that software upgrades alone can raise overall equipment effectiveness by double digits, illustrating why software is outpacing physical spend despite its smaller baseline. Services covering integration, remote monitoring, and continuous model retraining form a rising annuity stream for vendors as customers seek lifecycle support. The shift underlines how intelligence rather than mechanics now differentiates competitors in the AI in robotics market.

Industrial robots commanded 68% of the AI in robotics market size in 2024, led by articulated arms deployed in automotive and electronics production. Their installed base surpassed 4.28 million units in factories worldwide, a 10% annual gain that highlights entrenched demand. AI upgrades are letting these systems handle variable part geometries without downtime for re-teaching, boosting asset utilization. Cobots, still a minority of shipments, enjoy outsized growth as flexible automation becomes essential for high-mix, low-volume environments.

Medical & healthcare robots represent the fastest-growing class at a 26% CAGR for 2025-2030. Surgical systems incorporating computer vision and force feedback assist clinicians in minimally invasive procedures, trimming post-operative complications and length of stay. Hospital logistics robots autonomously ferry linens and medications through crowded corridors using simultaneous localization and mapping (SLAM) fused with AI decision engines. Consumer acceptance is widening, evidenced by homecare robots that support daily living tasks for seniors. Altogether, these trends diversify revenue pools and mitigate cyclical demand inherent in automotive-centric demand, benefiting the AI in robotics market.

The Artificial Intelligence in Robotics Market is Segmented by Component (Hardware and More), Robot Type (Industrial Robots, Service Robots and More), Application (Manufacturing and Assembly, Logistics and Warehousing, Healthcare and Surgery and More), End-User Industry (Automotive, Electronics, and Semiconductors, and More), and Geography.

Geography Analysis

Asia Pacific generated 47% of global revenue in 2024 driven by extensive automation programs in China, Japan, and South Korea. China alone installed 276,288 industrial robots in 2023, equal to 51% of world shipments, as local authorities provide tax incentives and low-interest loans to upgrade manufacturing competitiveness [ifr.org](https://www.ifr.org). Korean electronics firms add edge-AI vision to pick-and-place cells to manage wafer-level tolerances measured in microns, while Japanese automakers deploy AI cobots for final trim operations that require human-like dexterity. The region's projected 18% CAGR reflects not only manufacturing dominance but also fast-emerging healthcare and service robotics pilots.

North America ranks second, anchored by the United States where AI software expertise seeds robust startup formation and venture funding. Logistics giants retrofit existing conveyor grids with AI mobile robots to meet two-hour delivery windows. Automakers accelerate adoption as factories retool for battery electric vehicles, using AI to monitor weld quality on new lightweight materials. Canada's mining sector pilots autonomous haulage trucks that leverage AI perception stacks to navigate open-pit sites in low-GPS conditions, extending AI in robotics market penetration beyond factory walls. Mexico's industrial corridors likewise embrace AI retrofits to stay competitive following USMCA content rules.

Europe emphasizes ethical, safe, and trustworthy AI, shaping both technology development and regulatory frameworks. Germany leads robot density with 28,355 new installations in 2023, aided by government subsidies for Mittelstand automation projects. Horizon Europe grants encourage academic-industry clusters in robotics for agri-tech, healthcare, and green manufacturing. Nonetheless, diverging interpretations of CE marking and AI liability delay cross-border deployments, particularly for cobots. Growth potential in Central and Eastern Europe remains high as labor shortages push factories to invest. Smaller markets in South America, the Middle East, and Africa are nascent but benefit from turnkey Robot-as-a-Service contracts that lower upfront capital barriers, nudging global uptake of the AI in robotics market.

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List of Companies Covered in this Report:

NVIDIA Corporation / IBM Corporation / Microsoft Corporation / ABB Ltd. / FANUC Corporation / KUKA AG / Yaskawa Electric Corp. / Universal Robots A/S / Hanson Robotics Ltd. / Boston Dynamics, Inc. / Brain Corporation / Vicarious AI / Neurala, Inc. / Kindred AI / Preferred Networks, Inc. / Veo Robotics, Inc. / Fetch Robotics, Inc. / Blue River Technology (John Deere) / UiPath Inc. / SoftBank Robotics Group Corp. /

Additional Benefits:

 The market estimate (ME) sheet in Excel format /
3 months of analyst support /

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