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Edge AI for Industrial Automation Market Forecasts to 2032 – Global Analysis By Component (Edge AI Hardware, Edge AI Software and Edge AI Services), Deployment Model, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Edge AI for Industrial Automation Market is accounted for $3.04 billion in 2025 and is expected to reach $13.78 billion by 2032 growing at a CAGR of 24.1% during the forecast period. Industrial automation is being transformed by Edge AI, which processes artificial intelligence directly at the machine or device level on production floors. Unlike conventional cloud AI, Edge AI allows instant data analysis, enabling quicker decision-making for essential operations. It improves predictive maintenance, ensures higher quality control, and boosts overall efficiency while decreasing machine downtime. Local data processing also enhances security and privacy by keeping critical operational data on-site instead of sending it to remote servers. Furthermore, Edge AI allows flexible, scalable deployment across various industrial environments, helping manufacturers cut costs, optimize productivity, and swiftly respond to evolving production requirements.

According to Tata Consultancy Services (TCS), data from high-tech manufacturing operations reveals that Edge AI systems can reduce cloud transmission volume by 40–60%, while improving uptime and product quality through localized, intelligent decision-making.

Market Dynamics:

Driver:

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Enhanced operational efficiency

Operational efficiency in industrial settings is significantly improved through Edge AI, which optimizes workflows, automates repetitive tasks, and enables predictive maintenance. Intelligent monitoring and data-driven insights reduce errors and minimize resource wastage. Automated decisions facilitate rapid adjustments on production lines, limiting human intervention and enhancing overall performance. This leads to cost reductions, increased throughput, and the ability to meet growing demand without sacrificing quality. By leveraging Edge AI, manufacturers can refine processes, maximize machinery usage, and improve energy efficiency. The focus on efficiency and cost-effectiveness is a key driver of market growth, helping businesses maintains competitiveness and operational excellence.

Restraint:

High implementation costs

Implementing Edge AI for industrial automation demands substantial initial investments in advanced hardware, software, and infrastructure. This financial burden can be challenging for small and medium enterprises, hindering widespread adoption. Integrating Edge AI with legacy equipment often requires costly customization and expert personnel. Ongoing maintenance, software upgrades, and security measures further increase expenditure. Even though Edge AI improves operational efficiency, the high implementation cost remains a key barrier. Organizations with restricted budgets may continue relying on conventional automation techniques, making financial constraints a significant restraint on the global expansion of Edge AI in industrial environments.

Opportunity:

Adoption of smart manufacturing

Edge AI creates opportunities in smart manufacturing by providing real-time monitoring, predictive maintenance, and automated decision-making. Production facilities can optimize workflows, minimize downtime, and enhance product quality using on-site AI processing. Coupled with IoT devices, Edge AI enables seamless data collection and intelligent automation. As the demand for Industry 4.0 solutions grows, Edge AI emerges as a crucial driver of digital transformation. Implementing Edge AI allows manufacturers to increase efficiency, reduce costs, and quickly adapt to evolving

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production needs. This growing trend offers substantial market potential for Edge AI technologies in global industrial automation sectors.

Threat:

Rapid technological changes

Edge AI adoption faces threats from the rapid evolution of AI, IoT, and industrial automation technologies. New innovations and frequent system updates can quickly make current Edge AI solutions outdated. Companies may incur high costs and face operational challenges to update infrastructure in line with technological advancements. Such rapid changes create uncertainty for investors and manufacturers, potentially delaying implementation decisions. Organizations that cannot continuously upgrade risk lagging behind competitors while slower adopters may struggle to maintain operational efficiency. The fast pace of technological progress and the possibility of obsolescence pose a significant threat to the growth of the Edge AI market in industrial automation.

Covid-19 Impact:

The COVID-19 pandemic had a notable effect on the Edge AI for Industrial Automation Market, disrupting supply chains and postponing industrial initiatives. Workforce limitations and lockdown measures compelled manufacturers to implement automation technologies to sustain operations with fewer on-site employees. Edge AI became valuable for enabling remote monitoring, predictive maintenance, and operational control, minimizing reliance on human intervention. Despite its benefits, economic uncertainties and limited budgets slowed significant investments in advanced AI solutions. As industries recover, there is an accelerated push toward digital transformation, with Edge AI adoption increasing to improve efficiency, resilience, and workplace safety, presenting both market challenges and opportunities globally.

The edge AI hardware segment is expected to be the largest during the forecast period

The edge AI hardware segment is expected to account for the largest market share during the forecast period due to its essential function in enabling real-time data analysis and on-site decision-making. Industrial operations depend on processors, sensors, and dedicated computing equipment to implement Edge AI solutions successfully. Hardware serves as the backbone for supporting software and service applications while integrating with existing industrial systems and IoT devices. The growing need for dependable, high-performance, and energy-efficient hardware

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strengthens its market dominance. With industries increasingly focusing on automation, predictive maintenance, and process optimization, investments in Edge AI hardware remain substantial, making it the largest and most influential segment in the industrial Edge AI market.

The electronics & semiconductors segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the electronics & semiconductors segment is predicted to witness the highest growth rate, driven by the need for high precision, speed, and automation in manufacturing. Real-time monitoring, predictive maintenance, and defect detection are crucial for maximizing yields and reducing downtime in semiconductor and electronics production. Edge AI enables on-site data processing and analytics, enhancing operational efficiency and accuracy. Increasing adoption of smart factory technologies, Industry 4.0 practices, and automation-based quality control supports the rapid expansion of this segment. Continuous innovation in electronics manufacturing further positions this sector as a major contributor to the accelerated growth of the Edge AI market.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share due to rapid industrial digital transformation, significant R&D spending, and a well-established manufacturing infrastructure. The region hosts major AI and industrial automation companies, facilitating early and widespread deployment of Edge AI solutions. Key industries, including automotive, electronics, and semiconductors, leverage real-time analytics, predictive maintenance, and smart factory practices. Favorable government regulations and growing demand for Industry 4.0 technologies further support its market leadership. Technological innovation, an experienced workforce, and a strong industrial ecosystem enable North America to maintain the largest market share, making it the primary hub for global Edge AI adoption in industrial automation.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, driven by rapid industrial development and increasing adoption of AI-enabled smart manufacturing. Key economies, including China, Japan, South Korea, and India, are implementing Industry 4.0 strategies, real-time monitoring, and predictive

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maintenance across automotive, electronics, and heavy equipment sectors. Strong government support for industrial modernization and a growing focus on operational efficiency further accelerate growth. The region’s combination of emerging markets, technological progress, and expanding industrial infrastructure positions Asia-Pacific as the region with the highest growth rate, making it a major hub for Edge AI adoption in global industrial automation.

Key players in the market

Some of the key players in Edge AI for Industrial Automation Market include Siemens, Rockwell Automation, ABB, Schneider Electric, Honeywell, Emerson Electric, Mitsubishi Electric, Advantech, Dell Technologies, NVIDIA, Intel, Arm, Cyient, MosChip Technologies and Barbara Tech.

Key Developments:

In October 2025, Siemens Mobility has signed a major contract with Trivia Trens S.A. to modernise three of S?o Paulo’s commuter rail lines using Automatic Train Operation (ATO) over ETCS Level 2 – the most extensive deployment of this technology in Latin America. The project, covering 140 kilometres of track and 46 stations across lines 11-Coral, 12-Sapphire, and 13-Jade, will deliver a fully digital signalling and control system designed to increase capacity, safety, and efficiency across one of the busiest rail networks in the region.

In October 2025, ABB has signed a term sheet agreement with SwitcH2 to engineer and supply automation and electrification solutions for SwitcH2’s floating production, storage and offloading (FPSO) unit dedicated to producing green ammonia from green hydrogen, to support future demand for low-carbon marine fuels.

In April 2023, Rockwell Automation, Inc signed a Memorandum of Understanding to form a partnership with leading global robot manufacturer Doosan Robotics and its parent company Doosan Corporation, both Seoul-based entities and members of the historic summit in Washington, D.C., commemorating the 70th anniversary of the U.S. – South Korea alliance.

Components Covered:

- Edge AI Hardware

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- Edge AI Software
- Edge AI Services

Deployment Models Covered:

- On-Premise Edge
- Hybrid Edge-Cloud
- Federated Learning Models

Applications Covered:

- Predictive Maintenance
- Quality Inspection
- Process Optimization
- Human-Machine Interface (HMI)
- Safety & Compliance Monitoring

End Users Covered:

- Automotive Manufacturing
- Electronics & Semiconductors
- Food & Beverage Processing
- Chemical & Pharmaceutical Plants
- Heavy Machinery & Equipment

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Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China
  - India
  - Australia
  - New Zealand
  - South Korea
  - Rest of Asia Pacific

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South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

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customization options:

- Company Profiling
  - Comprehensive profiling of additional market players (up to 3)
  - SWOT Analysis of key players (up to 3)
- Regional Segmentation
  - Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)
- Competitive Benchmarking
  - Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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List Of Tables

LIST OF TABLES

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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