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Blockchain Applications in Industrial Automation Market Forecasts to 2032 – Global Analysis By Component (Hardware, Software and Services), Organization Size, Technology, Functional Use Case, Deployment Mode, Application and By Geography

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Abstracts

According to Stratistics MRC, the Global Blockchain Applications in Industrial Automation Market is accounted for $7.20 billion in 2025 and is expected to reach $29.80 billion by 2032 growing at a CAGR of 22.5% during the forecast period. In industrial automation, blockchain applications are revolutionizing operations through decentralized, secure, and transparent data handling. By enabling immutable records, blockchain builds trust among machines, suppliers, and partners while ensuring accurate transaction histories. This technology greatly enhances supply chain visibility, allowing precise monitoring of materials and product flows. Within automated systems, blockchain guarantees data authenticity, supporting reliable machine-to-machine communication. Smart contracts further optimize workflows by automating transactions, contracts, and service agreements without manual intervention. Moreover, blockchain provides robust cybersecurity, shielding connected factories from hacking and manipulation. Collectively, it drives efficiency, reliability, and accountability, making industrial automation systems smarter and more resilient.

According to the European Commission, Industry 5.0 promotes a shift toward human-centric, sustainable, and resilient industrial systems. While blockchain is not named as the sole enabler, it is recognized among the enabling technologies that support decentralization, transparency, and secure data exchange—especially in supply chains and automation networks.

Market Dynamics:

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Driver:

Enhanced supply chain transparency

One of the main drivers of blockchain adoption in industrial automation is the need for improved supply chain transparency. Blockchain creates immutable, decentralized records that track every stage of material flow, from procurement to delivery. This helps industries combat counterfeiting, meet compliance standards, and ensure ethical sourcing. Automated systems benefit as blockchain provides real-time visibility into processes, minimizing errors and delays. The technology also facilitates reliable verification of supplier transactions, enhancing trust across networks. By granting stakeholders secure access to validated data, blockchain strengthens accountability. Ultimately, it optimizes efficiency, lowers risks, and supports sustainable resource utilization throughout industrial supply chains.

Restraint:

High implementation costs

High costs remain a significant barrier to blockchain applications in industrial automation. Establishing blockchain systems demands heavy investment in technology infrastructure, specialized software, and skilled personnel. Companies must adjust existing automated operations to support decentralized frameworks, which can be costly and time-consuming. For small and mid-sized enterprises, financial constraints often prevent them from adopting blockchain solutions. Moreover, ongoing expenditures related to energy, system maintenance, and upgrades add to the challenge. The overall complexity of blockchain integration makes it difficult for many firms to justify the expense. As a result, steep implementation costs restrict the widespread use of blockchain in automation.

Opportunity:

Integration with IoT and AI

A major opportunity for blockchain in industrial automation lies in its seamless integration with IoT and AI. Automated operations generate massive datasets that require secure validation, and blockchain ensures transparency and immutability of this information. Artificial intelligence leverages blockchain-verified data for accurate

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forecasting, smart decision-making, and predictive maintenance. Likewise, IoT ecosystems benefit from blockchain's ability to enhance device-to-device trust, preventing malicious interference. This fusion allows industries to design intelligent, adaptive, and self-managed systems that improve efficiency and minimize operational risks. With the increasing adoption of IoT and AI, blockchain creates a promising pathway to strengthen automation and unlock long-term growth.

Threat:

Energy consumption concerns

Energy consumption remains a significant threat to blockchain adoption in industrial automation. Many blockchain platforms, especially those using proof-of-work mechanisms, require massive amounts of electricity to function. This contradicts the sustainability targets that modern industries are striving to achieve. The high power demand not only increases operating expenses but also attracts regulatory scrutiny as governments enforce stricter emission controls. Companies risk damaging their reputation if blockchain usage is seen as environmentally harmful. Unless more eco-friendly consensus mechanisms, such as proof-of-stake, gain traction, energy concerns will persist. This environmental challenge represents a critical barrier to blockchain's growth in automated manufacturing systems.

Covid-19 Impact:

The Covid-19 outbreak had a profound impact on the blockchain applications in industrial automation market, driving faster adoption of digital and automated solutions. Global supply chain disruptions exposed weaknesses in transparency and traceability, pushing industries to consider blockchain for improved monitoring and trust. Automated production environments benefited from blockchain's ability to secure data exchanges and reduce reliance on manual oversight. Although budget cuts and postponed investments limited widespread deployment during the crisis, the pandemic reinforced blockchain's role in strengthening resilience. In the long term, blockchain is expected to play a crucial role in enabling reliable, efficient, and future-ready industrial automation.

The software segment is expected to be the largest during the forecast period

The software segment is expected to account for the largest market share during the forecast period. These platforms enable the secure validation, storage, and exchange of industrial data, ensuring accuracy and trust. Software also supports advanced functions

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like smart contracts, seamless machine integration, and transparent workflow management. Its flexibility allows industries to tailor blockchain solutions for various needs, including asset tracking, automated decision-making, and system optimization. Moreover, software's ability to scale and interoperate across networks strengthens its value in global operations. By enabling efficiency, transparency, and reliability, the software segment represents the cornerstone of blockchain adoption in automation.

The blockchain + IoT (IIoT) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the blockchain + IoT (IIoT) segment is predicted to witness the highest growth rate, fueled by the proliferation of interconnected devices and the demand for real-time insights. Combining blockchain with IIoT provides secure and immutable communication between machines, sensors, and industrial systems. This integration supports enhanced efficiency, accurate predictive maintenance, and transparent supply chain monitoring, while reducing reliance on human intervention. With the ongoing shift toward smart factories and digitalized operations, blockchain-powered IIoT solutions are expanding rapidly. The segment's strong CAGR highlights how connected industrial networks, backed by secure and reliable data management, are transforming automation practices worldwide.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, owing to its well-established technological infrastructure, proactive adoption of Industry 4.0, and substantial investment in smart manufacturing. Manufacturing sectors in this region are rapidly deploying blockchain integrated with AI, IoT, and digital twin technologies to improve operational efficiency, supply chain transparency, and predictive analytics. Government support, a strong network of tech providers, and research-driven initiatives accelerate implementation of blockchain solutions. The focus on secure data handling, process optimization, and resilient operations further drives adoption. North America's position as a front-runner underscores its role in shaping the industrial automation landscape through advanced blockchain integration.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, fueled by rapid industrial expansion, rising Industry 4.0 adoption, and increasing

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investments in intelligent manufacturing. Key countries such as China, Japan, and South Korea are leveraging blockchain combined with AI, IoT, and digital twin technologies to optimize production processes, enhance supply chain transparency, and support predictive maintenance. Favorable government initiatives and a rising demand for automated, technology-driven solutions promote extensive blockchain integration. The region's emphasis on innovation and digital modernization further propels adoption. This high CAGR underscores Asia-Pacific's emergence as a leading market for blockchain-based industrial automation solutions.

Key players in the market

Some of the key players in Blockchain Applications in Industrial Automation Market include IBM, Oracle, SAP, Festo, Cognizant, Moog Aircraft Group, Renault, VeChain, Chronicled Inc., Hyperledger, Microsoft, Nadcab Labs, Oodles Technologies, Fetch.ai and Siemens.

Key Developments:

In February 2025, Renault and China's Zhejiang Geely Holding Group plan to jointly produce and sell electric and low-emissions vehicles in Brazil as the automakers deepen their partnership. Geely will invest in Renault's Brazilian unit and in return get access to its production, sales and services network in the country.

In January 2025, Cognizant has announced an expansion of its longstanding relationship with Gilead Sciences. The expanded agreement aims to deliver greater cost leadership and productivity enhancement for Gilead while seeking to extract greater value from the existing relationship. Leveraging machine learning and generative AI within an agentic framework, the work addresses multiple use cases across customer service, employee interactions, and business value management.

In January 2025, IBM and Telef?nica Tech announced a collaboration agreement to develop and deliver security solutions that address security challenges posed by future cryptographically relevant quantum computers. The advent of quantum computing will allow for more advanced calculations, but it also brings with it a critical challenge: ensuring data security in a future where traditional encryption algorithms could become vulnerable.

Components Covered:

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Hardware

Software

Services

Organization Sizes Covered:

Large Enterprises

Small & Medium Enterprises (SMEs)

Technologies Covered:

Blockchain + AI

Blockchain + IoT (IIoT)

Blockchain + Digital Twin

Functional Use Cases Covered:

Supply Chain Traceability

Asset Lifecycle Management

Predictive Maintenance

Quality Assurance & Compliance

Data Security & Access Control

Deployment Modes Covered:

On-Premise

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- Cloud-Based

Applications Covered:

- Discrete Manufacturing
- Process Manufacturing
- Energy & Utilities
- Aerospace & Defense
- Logistics & Warehousing
- Industrial Robotics & Automation Systems

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France

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- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia
- UAE
- Qatar
- South Africa

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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:

All the customers of this report will be entitled to receive one of the following free 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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