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AI in 5G Networks Market Forecasts to 2034 – Global Analysis By Component (Solutions, Platforms and Services), Deployment, 5G Spectrum Band, Technology, Application, End User and By Geography

https://marketpublishers.com/r/A217D310D1F3EN.html
Date: April 2026
Pages: 200
Price: US$ 4,150.00 (Single User License)
ID: A217D310D1F3EN

Abstracts

According to Stratistics MRC, the Global AI in 5G Networks Market is accounted for $8.4 billion in 2026 and is expected to reach $18.6 billion by 2034 growing at a CAGR of 10.4% during the forecast period. AI in 5G networks refers to the integration of machine learning, deep reinforcement learning, federated learning, and AI-powered automation into 5G network architecture components including radio access network management, core network orchestration, network slicing optimization, spectrum management, predictive interference mitigation, autonomous fault detection, and intelligent traffic steering systems that enable telecom operators to deliver dynamic network performance optimization, reduced operational costs, and new AI-native service capabilities across 5G standalone and non-standalone network deployments.

Market Dynamics:

Driver:

5G Network Complexity Management

Exponentially increasing 5G network architecture complexity across massive MIMO antenna arrays, heterogeneous multi-frequency spectrum management, and dynamic network slicing configuration demands surpass human operator management capacity, creating mandatory AI adoption requirements for telecom operators deploying 5G networks at commercial scale. AI-powered radio access network optimization reducing energy consumption and improving spectral efficiency delivers measurable operational

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cost savings that justify AI network management platform investment with documented returns exceeding conventional network management system costs.

Restraint:

Telecom AI Integration Costs

Substantial integration costs for AI network management systems within existing telecom operational support system and business support system environments constrain deployment pace as legacy OSS/BSS architectures require extensive API development and data pipeline engineering to provide the real-time network telemetry inputs that AI optimization algorithms require for effective network performance management. Integration complexity creates multi-year implementation timelines that delay AI 5G platform revenue realization for both vendors and operators.

Opportunity:

Open RAN AI Optimization

Open Radio Access Network architecture adoption creating standardized AI interface specifications represents a major market expansion opportunity as Open RAN xApp and rApp AI application ecosystems enable telecom equipment-agnostic AI optimization deployment across multi-vendor RAN environments. Telecom operator Open RAN investment programs eliminating vendor lock-in while enabling AI-powered network optimization are creating new market entry opportunities for AI-native RAN intelligence platform vendors beyond traditional network equipment provider ecosystems.

Threat:

Network Virtualization Security Risks

AI-managed virtualized 5G core network and radio access network software security vulnerabilities create cyberattack exposure risks that may constrain government and enterprise adoption of AI-optimized 5G network deployments in security-sensitive applications where network manipulation through AI management system compromise could enable traffic interception, service disruption, or unauthorized network access affecting critical communications infrastructure.

Covid-19 Impact:

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COVID-19 demonstrated 5G network strategic importance as pandemic-era remote work, telemedicine, and digital service delivery demands exposed bandwidth limitations of legacy 4G infrastructure and accelerated government 5G deployment investment. AI-powered network optimization enabling maximum utilization of deployed 5G spectrum capacity proved essential for accommodating unprecedented traffic growth during lockdown periods. Post-pandemic digital economy expansion and enterprise private 5G network deployment continue driving AI network management demand.

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

The services segment is expected to account for the largest market share during the forecast period, due to substantial telecom operator demand for AI network management implementation services, RAN optimization consulting, network AI model training and deployment, and ongoing managed AI network operations services that accompany complex 5G AI platform deployments requiring deep network expertise and continuous AI model performance management across evolving 5G network configurations and traffic pattern changes.

The cloud segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the cloud segment is predicted to witness the highest growth rate, driven by telecom operator adoption of cloud-native 5G core network architectures enabling AI-powered network function orchestration, predictive scaling, and intelligent traffic management through cloud-delivered network AI services that provide the computational elasticity required to process massive real-time network telemetry streams for AI-driven optimization across large-scale 5G network deployments.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, due to the United States completing large-scale 5G standalone network deployments across major carriers including Verizon, AT&T, and T-Mobile generating substantial AI network management platform procurement demand, combined with leading telecom AI vendors and semiconductor companies including Qualcomm, Intel, and NVIDIA generating significant North American AI 5G technology revenue from established operator relationships.

Region with highest CAGR:

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Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, due to China completing the world's largest 5G network deployment with the highest 5G base station density globally requiring sophisticated AI network optimization, Japan and South Korea advancing 5G standalone network architecture adoption, and India implementing large-scale 5G rollout programs across urban and rural coverage areas creating extensive AI network management platform procurement demand.

Key players in the market

Some of the key players in AI in 5G Networks Market include Ericsson, Nokia Corporation, Huawei Technologies, ZTE Corporation, Samsung Electronics, Cisco Systems Inc., Qualcomm Inc., Intel Corporation, IBM Corporation, Microsoft Corporation, Google LLC, Amazon Web Services Inc., NEC Corporation, Fujitsu Limited, VMware Inc., Oracle Corporation, and Hewlett Packard Enterprise.

Key Developments:

In February 2026, Nokia Corporation introduced MantaRay Network Intelligence AI platform expansion with automated 5G network slicing optimization and predictive capacity management capabilities for enterprise private network operators.

In January 2026, Samsung Electronics secured a major 5G Open RAN AI deployment contract with a North American tier-one operator implementing AI-powered radio resource management across its nationwide 5G standalone network infrastructure.

In November 2025, NEC Corporation launched an AI-powered 5G core network orchestration platform enabling telecom operators to autonomously manage virtual network function scaling and service quality optimization across hybrid cloud deployments.

Components Covered:

- Solutions
- Platforms
- Services

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Deployments Covered:

- Cloud
- On-Premise
- Edge
- Hybrid Deployment
- Centralized RAN (C-RAN)
- Virtualized RAN (vRAN)

5G Spectrum Bands Covered:

- Low-Band (Sub-1 GHz)
- Mid-Band (1 GHz – 7 GHz)
- High-Band (mmWave, 24 GHz – 100 GHz)

Technologies Covered:

- Generative AI (GenAI)
- Reinforcement Learning
- Computer Vision
- Predictive Analytics
- Federated Learning

Applications Covered:

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- Network Optimization
- Predictive Maintenance
- Resource Allocation
- Security Management

End Users Covered:

- Telecom
- Automotive
- Healthcare
- Media & Entertainment
- Other End Users

Regions Covered:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - United Kingdom
  - Germany
  - France

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- Italy
- Spain
- Netherlands
- Belgium
- Sweden
- Switzerland
- Poland
- Rest of Europe

Asia Pacific

- China
- Japan
- India
- South Korea
- Australia
- Indonesia
- Thailand
- Malaysia
- Singapore
- Vietnam

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- Rest of Asia Pacific
- South America
  - Brazil
  - Argentina
  - Colombia
  - Chile
  - Peru
  - Rest of South America
- Rest of the World (RoW)
  - Middle East
    - Saudi Arabia
    - United Arab Emirates
    - Qatar
    - Israel
    - Rest of Middle East
  - Africa
    - South Africa
    - Egypt
    - Morocco
    - Rest of Africa

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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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- 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)

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Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) Regions are also represented in the same manner as above.

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