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Quantum Computing in Telecom & IT Market Forecasts to 2032 – Global Analysis By Component (Hardware, Software and Services), Deployment, Technology, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Quantum Computing in Telecom & IT Market is accounted for $350 million in 2025 and is expected to reach $4034.61 million by 2032 growing at a CAGR of 41.8% during the forecast period. Quantum computing is rapidly becoming a game-changing technology for telecom and IT industries, delivering computational capabilities far beyond traditional architectures. Its ability to process enormous datasets at extraordinary speeds supports smarter network management, improved routing, and advanced predictive modeling. Telecom companies can apply quantum techniques to boost spectrum utilization, strengthen quantum-resistant security, and streamline the evolution from 5G toward future 6G networks. In the IT domain, quantum platforms empower stronger cybersecurity, faster cloud computing, and more efficient performance analytics. With accelerating investments and research, quantum computing is set to redefine communication and computing frameworks, driving superior efficiency, speed, and security across modern digital systems.

According to the University of Science and Technology of China (2017–2020), a 2,000 km quantum key distribution (QKD) backbone connects Beijing and Shanghai, and the Micius satellite demonstrated secure quantum communication over global distances, proving telecom-grade deployment.

Market Dynamics:

Driver:

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Rising demand for high-performance computing

Surging computational requirements across telecom and IT industries are significantly contributing to quantum computing growth. Quantum processors provide extraordinary processing performance that enables rapid analytics, intricate modeling, and highly accurate simulations. Telecom environments rely on this capability to manage huge data volumes, optimize spectrum performance, and support AI-powered automation. In the IT landscape, expanding cloud ecosystems, cybersecurity analytics, and large-scale data workloads require faster, smarter computing platforms. Quantum systems address these challenges by performing complex tasks with unmatched efficiency compared to traditional architectures. As organizations seek improved processing speed and greater analytical power, quantum computing becomes an essential technology for advanced digital operations.

Restraint:

High implementation and infrastructure costs

Quantum computing growth in telecom and IT is hindered by the massive costs associated with development, deployment, and system integration. Quantum machines demand advanced hardware, ultra-low-temperature cooling systems, and highly specialized laboratory setups that exceed typical enterprise budgets. Integrating these technologies into telecom networks also requires substantial modernization, adding to overall investment pressures. Since commercially viable quantum processors remain limited, procurement and maintenance become even more costly. For many mid-sized and smaller companies, the uncertain payback period makes such investments difficult to justify. As a result, financial constraints remain a major barrier, slowing broader adoption and preventing quantum computing from becoming mainstream technology.

Opportunity:

Development of quantum-enhanced cyber security solutions

Expanding cybersecurity demands create substantial opportunities for quantum technologies in telecom and IT. As modern attacks grow more advanced, quantum computing supports next-generation encryption techniques, highly secure communication links, and quantum key distribution systems capable of resisting future quantum-based threats. Telecom companies can adopt quantum-secure frameworks to safeguard network operations, cloud systems, and confidential customer data. The

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industry’s move toward zero-trust models increases the need for stronger, quantum-resistant protection tools. With continued investment in security infrastructures and rising awareness of vulnerabilities in traditional encryption, quantum cybersecurity solutions have enormous potential to reshape how organizations defend their digital assets and critical communication networks.

Threat:

Risk of quantum-enabled cyber attacks

A major threat facing the telecom and IT industries is the possibility of cyber attacks powered by quantum computing. Advanced quantum systems could eventually break traditional encryption, leaving networks, cloud platforms, and confidential data exposed. Organizations that continue relying on classical cryptography may experience severe security gaps, making telecom infrastructures increasingly vulnerable. Cybercriminals could use quantum tools to bypass authentication protocols, intercept communication channels, or decode highly sensitive information. As quantum development accelerates, the risk of exploitation grows, pressuring companies to adopt quantum-resistant security frameworks. Without proactive defense strategies, future telecom and IT systems may face widespread data breaches and operational failures.

Covid-19 Impact:

COVID-19 produced both positive and negative effects on the Quantum Computing in Telecom & IT Market. As digital usage surged, telecom and IT companies increasingly recognized the value of quantum computing for managing higher data loads, improving system reliability, and supporting remote operations. At the same time, global restrictions disrupted supply chains, slowed laboratory work, and delayed prototype development due to limited staffing and funding shifts. Many firms redirected budgets toward urgent continuity measures, reducing short-term quantum investments. Nevertheless, the crisis emphasized the importance of powerful computing, strong cybersecurity, and efficient network performance, ultimately reinforcing long-term interest in adopting quantum-based solutions.

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

The hardware segment is expected to account for the largest market share during the forecast period because it forms the core infrastructure required to run quantum operations. Telecom and IT providers rely on sophisticated quantum processors, qubit

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architectures, and specialized physical components to accelerate computing performance, improve security, and enhance network intelligence. Progress in superconducting platforms, ion-based systems, and photonic technologies continues to strengthen hardware adoption as firms aim to deploy scalable, stable quantum environments. Ongoing investments in manufacturing capabilities, laboratory development, and experimental setups further emphasize the importance of hardware as the essential building block driving market growth and technological advancement.

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

Over the forecast period, the cloud-based segment is predicted to witness the highest growth rate because it allows enterprises to access quantum capabilities without investing in expensive physical hardware. Telecom and IT companies increasingly prefer Quantum-as-a-Service models to run experiments, enhance network intelligence, and strengthen cybersecurity while maintaining operational flexibility. Cloud deployment supports continuous upgrades, remote development, and smooth integration with existing IT environments. With rising interest in advanced computing and rapid digital transformation, cloud-delivered quantum platforms provide a cost-effective and scalable option, driving accelerated adoption and enabling organizations to explore high-performance applications more efficiently.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, owing to substantial backing from government and corporate players. The United States, especially, leads in quantum innovation, fueled by national quantum programs and major technology firms. Telecom and IT organizations in this area are quick to leverage quantum computing for encryption, large-scale computation, and network efficiency. With a well-established infrastructure, advanced cloud services, and close ties between universities and industry, North America has become a hub for quantum commercialization. This strong ecosystem positions it as the driving force behind quantum adoption in telecom and IT.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR due to strategic government focus, rapid technological advancement, and increasing investment from leading tech players. Nations like China, Japan, South

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Korea, and Singapore are accelerating quantum innovation with specialized programs, extensive funding, and robust research partnerships. Telecom and IT providers are integrating quantum technologies for secure communication, advanced computation, and improved network performance. With expanding digital infrastructure, a strong hardware manufacturing base, and rising expertise in quantum science, the region is set for exceptional growth. These strengths firmly establish Asia-Pacific as the fastest-expanding market for quantum computing applications.

Key players in the market

Some of the key players in Quantum Computing in Telecom & IT Market include IBM, D-Wave Systems, IonQ, Rigetti Computing, Amazon Web Services (AWS), Microsoft (Azure Quantum), QC Ware, Quantinuum, Toshiba, Google Quantum AI, NTT, Cambridge Quantum Computing, Accenture, Xanadu and SuperQ Quantum Computing Inc.

Key Developments:

In November 2025, IBM and Atruvia AG have sealed a long-term collaboration that paves the way for sustainable and state-of-the-art IT platforms for the banking of tomorrow. Atruvia will use IBM z17, which was announced earlier this year, as a cornerstone supports its mission critical operations including the core banking system.

In November 2025, Amazon Web Services, Inc. and HUMAIN announced at the U.S.-Saudi Investment Forum their plans to provide, deploy and manage up to 150,000 AI accelerators in a data center facility known as an “AI Zone” in Riyadh. As part of the expanded partnership, AWS will become HUMAIN’s preferred AI partner globally, and the two companies will collaborate to bring AI compute and services from Saudi Arabia to customers worldwide.

In November 2025, NTT, Inc. and OptQC Corp. have signed a collaboration agreement to realize scalable and highly reliable optical quantum computers. Under this agreement, the two companies will apply advanced optical communication technologies—such as optical amplification and multiplexing—to the development of optical quantum computers.

Components Covered:

Hardware

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Software

Services

Deployments Covered:

On-premise

Cloud-based

Technologies Covered:

Quantum Annealing

Gate-based Quantum Computing

Topological Quantum Computing

Photonic Quantum Computing

Applications Covered:

Network Optimization & Traffic Management

Quantum Cryptography & Secure Communication

Cloud Quantum Services (QaaS)

Data Center Optimization

AI/ML Acceleration for Telecom Analytics

Cybersecurity & Encryption

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End Users Covered:

- Telecom Operators
- IT Service Providers
- Enterprises

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China

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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

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)

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- 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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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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