

India 5G Technology Market By Component (Hardware, Software, Services), By Technology (Enhanced Mobile Broadband [eMBB], Ultra-Reliable Low Latency Communication [URLLC], Massive Machine Type Communication [mMTC]), By Spectrum (5G NR Sub-6GHz, 5G NR mmWave), By Application (Consumer, Enterprises), By Region, Competition, Forecast and Opportunities 2020-2030F

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Abstracts

India 5G Technology Market was valued at USD 25.6 billion in 2024 and is expected to reach at USD 159.1 Billion in 2030 and project robust growth in the forecast period with a CAGR of 35.4% through 2030. The India 5G technology market is experiencing robust growth, driven by the country's rapid digital transformation and increasing demand for high-speed connectivity. As one of the largest and fastest-growing mobile markets in the world, India is poised to become a significant player in the global 5G landscape. The rollout of 5G technology promises to revolutionize various sectors, including telecommunications, healthcare, manufacturing, and smart cities, by offering significantly faster data speeds, lower latency, and enhanced network efficiency. Major telecom operators are investing heavily in 5G infrastructure to support the anticipated surge in data consumption and enable advanced applications such as IoT, autonomous vehicles, and augmented reality. Government initiatives and policy support, including spectrum allocation and infrastructure development, further bolster market growth. Additionally, the increasing adoption of digital services and the need for improved connectivity in urban and rural areas are key factors driving the expansion of the 5G market in India. As the technology continues to evolve, it is expected to play a crucial role in accelerating India's digital economy and fostering innovation across various

industries.

Key Market Drivers

Government Initiatives and Policy Support

The Indian government has been a pivotal driver of the 5G technology market through a series of proactive policies and strategic initiatives. The Department of Telecommunications (DoT) has facilitated the allocation of spectrum for 5G, providing clarity and encouraging investments in this emerging technology. Additionally, government programs such as the National Digital Communications Policy (NDCP) 2018 aim to foster innovation and infrastructure development by setting ambitious targets for digital connectivity. The push towards digitizing various sectors, including healthcare, education, and agriculture, aligns with the broader vision of a digitally empowered India. These policies not only support the development and deployment of 5G infrastructure but also create a favorable regulatory environment that stimulates private sector investment. By reducing bureaucratic hurdles and offering incentives, the government ensures that the 5G rollout is both efficient and widespread, accelerating the market's growth. Governments worldwide are investing heavily in 5G infrastructure to promote economic growth, digital inclusion, and technological advancements. For instance, the U.S. Federal Communications Commission (FCC) allocated USD 9 billion in funding to accelerate rural 5G deployment through the 5G Fund for Rural America.

Advancements in Technology and Infrastructure

Technological advancements and infrastructure development are crucial factors driving the 5G market in India. Innovations in network technologies, such as the evolution of small cell deployments and beamforming techniques, enhance the efficiency and performance of 5G networks. Investments in modernizing existing infrastructure and deploying new network equipment support the high-speed, low-latency capabilities of 5G. The development of edge computing and network slicing technologies further optimizes the delivery of specialized services, such as enhanced mobile broadband and massive machine-type communications. Telecom operators are also exploring partnerships with technology providers to accelerate the rollout of 5G infrastructure. These advancements ensure that 5G networks can meet the growing demands of consumers and businesses, driving the market forward. Governments are holding spectrum auctions to allocate valuable frequency bands for 5G services. For example, the EU has committed to launching 5G connectivity across all European regions by 2030, with over ?200 billion in investments, while India's government plans to auction

5G spectrum worth approximately ₹4.9 lakh crore (\$65 billion) in 2025.

Rising Adoption of Digital Services

The increasing adoption of digital services across various sectors significantly contributes to the growth of the 5G market in India. With the proliferation of mobile applications, e-commerce platforms, and online services, there is a growing need for faster and more reliable network connectivity to support these services. 5G technology enables enhanced user experiences by providing higher data speeds, reduced latency, and greater network capacity, essential for the seamless operation of digital services. The rise of digital payments, remote work, and online education further accelerates the demand for 5G. As more businesses and consumers embrace digital transformation, the necessity for advanced connectivity solutions becomes more pronounced, driving the expansion of the 5G market. The 5G rollout is expected to create millions of new jobs worldwide. For example, the U.S. Chamber of Commerce estimates that 5G deployment will support 3 million new jobs in the next decade, ranging from engineers to construction workers involved in the installation of 5G infrastructure.

Key Market Challenges

High Deployment Costs

One of the significant challenges facing the India 5G technology market is the high cost associated with the deployment and infrastructure development required for 5G networks. The implementation of 5G technology necessitates substantial investments in new infrastructure, including base stations, antennas, and network equipment, which can be prohibitively expensive. Additionally, telecom operators must invest in upgrading existing network infrastructure to support 5G capabilities. The financial burden of these investments is compounded by the need for extensive planning and coordination with local authorities for site acquisitions and infrastructure development. For many operators, especially smaller ones, these costs pose a significant barrier to entry and can impact their ability to compete effectively in the market. The challenge is further exacerbated by the long-term return on investment, as the revenue generated from 5G services may take years to offset the initial capital expenditures. Addressing this challenge requires innovative financing models, strategic partnerships, and government support to share the cost burden and facilitate a more efficient rollout of 5G technology.

Regulatory and Policy Challenges

Regulatory and policy challenges present another hurdle for the India 5G technology market. The deployment of 5G networks involves navigating complex regulatory environments and adhering to various compliance requirements. In India, telecom regulations are often characterized by bureaucratic red tape and slow decision-making processes, which can delay the approval of spectrum allocations and infrastructure projects. Additionally, the regulatory framework may not always keep pace with the rapid advancements in 5G technology, leading to uncertainties and potential compliance issues for operators. This regulatory complexity can hinder the smooth rollout of 5G networks and increase operational costs. Moreover, the need for coordinated efforts among different government agencies and local authorities can lead to delays and additional challenges. Streamlining regulatory processes, updating policies to align with technological advancements, and fostering collaboration between stakeholders are essential to overcoming these regulatory and policy challenges and facilitating the growth of the 5G market.

Spectrum Allocation and Management

Spectrum allocation and management are critical challenges in the India 5G technology market. 5G networks require access to higher frequency bands, including millimeter-wave spectrum, which is often limited and highly sought after. The availability and allocation of this spectrum are managed by government authorities, and competition for these frequencies can be intense. In India, the process of spectrum allocation has historically been complex and contentious, with issues related to pricing, auction processes, and spectrum refarming. Delays in spectrum auctions or disputes over spectrum pricing can hinder the timely rollout of 5G services and impact network performance. Additionally, effective spectrum management is crucial for ensuring that different frequency bands are used efficiently to avoid interference and optimize network capacity. Addressing these challenges requires a well-structured spectrum management strategy, transparent auction processes, and policies that support efficient utilization of available spectrum to facilitate the growth and deployment of 5G technology.

Technological and Interoperability Issues

Technological and interoperability issues pose significant challenges to the India 5G technology market. The transition to 5G involves integrating new technologies and standards with existing network infrastructure, which can be complex and fraught with technical difficulties. Ensuring that different 5G components, such as base stations, network equipment, and end-user devices, work seamlessly together is critical for

delivering the promised performance and reliability of 5G networks. Interoperability issues can arise due to variations in technology standards, vendor-specific implementations, and compatibility with legacy systems. These challenges can lead to increased costs, extended deployment timelines, and potential service disruptions. Additionally, the rapid pace of technological advancements in the 5G space requires continuous updates and upgrades to network infrastructure, further complicating the integration process. To overcome these issues, it is essential to adopt standardized protocols, invest in research and development, and collaborate with industry stakeholders to ensure compatibility and smooth integration of 5G technologies.

Key Market Trends

Expansion of 5G Infrastructure in Urban and Rural Areas

The expansion of 5G infrastructure across both urban and rural areas is a key trend shaping the India 5G technology market. Historically, telecom infrastructure development in India has been concentrated in urban centers due to higher population density and revenue potential. However, with the advent of 5G technology, there is a strategic push to extend coverage to rural and semi-urban regions. This expansion is driven by the need to bridge the digital divide and ensure that the benefits of high-speed connectivity are available nationwide. Rural areas are becoming increasingly attractive for telecom operators as the government encourages digital inclusion through various initiatives. Investments are being made to deploy 5G base stations and small cells in underserved areas, facilitating access to high-speed internet and digital services. This trend is supported by government policies aimed at improving connectivity and the growth of digital services in remote regions. As infrastructure expands, rural areas are expected to experience enhanced connectivity, which will foster economic development and digital adoption across diverse sectors. By the end of 2025, 5G networks are expected to cover approximately 60% of the world's population, and 2.7 billion 5G connections are forecasted. For instance, in South Korea, the government has supported early commercial deployments, making it one of the first countries to launch a nationwide 5G network.

Increased Adoption of IoT and Smart Solutions

The increased adoption of Internet of Things (IoT) devices and smart solutions is driving the demand for 5G technology in India. IoT applications, such as smart agriculture, industrial automation, and connected healthcare, require the low latency and high bandwidth that 5G offers. The Indian market is seeing a surge in smart solutions aimed

at improving efficiency and productivity across various sectors. For instance, smart cities are deploying IoT-based solutions for traffic management, waste management, and public safety, all of which depend on the advanced capabilities of 5G networks. Similarly, in agriculture, IoT sensors powered by 5G technology are being used for precision farming and remote monitoring. The rapid growth of IoT applications is creating a substantial demand for 5G infrastructure to support these technologies and ensure seamless connectivity. As more industries adopt IoT solutions, the need for robust 5G networks to facilitate real-time data processing and communication is expected to increase significantly.

Rise of Private 5G Networks

The rise of private 5G networks is emerging as a notable trend in the India 5G technology market. Enterprises across various industries are exploring private 5G networks to enhance their operational efficiency, security, and control over their connectivity needs. Private 5G networks offer dedicated bandwidth, lower latency, and improved security, which are critical for applications such as industrial automation, smart manufacturing, and private communications. Companies in sectors like manufacturing, logistics, and healthcare are investing in private 5G networks to support mission-critical applications and ensure seamless and reliable connectivity. This trend is driven by the need for customized solutions that cater to specific business requirements and provide better performance compared to public networks. As industries recognize the benefits of private 5G, the adoption of these networks is expected to grow, creating opportunities for telecom operators and technology providers to offer tailored solutions and services.

Government and Policy Support for 5G Deployment

Government and policy support is a significant trend influencing the India 5G technology market. The Indian government has demonstrated a strong commitment to advancing 5G technology through supportive policies and regulatory frameworks. Initiatives such as the National Digital Communications Policy (NDCP) 2018 and the National Broadband Mission aim to enhance digital infrastructure and connectivity across the country. The government has also undertaken spectrum auctions to allocate frequencies for 5G services and has provided incentives for the deployment of 5G infrastructure. Additionally, public-private partnerships and collaborative efforts between government agencies and telecom operators are facilitating the rapid rollout of 5G networks. These policy measures are crucial for overcoming challenges related to spectrum allocation, infrastructure development, and regulatory hurdles. As the

government continues to support and promote 5G technology, it will play a pivotal role in accelerating market growth and ensuring the successful deployment of 5G networks nationwide.

Focus on Advanced Use Cases and Applications

A growing focus on advanced use cases and applications is shaping the India 5G technology market. The deployment of 5G networks is not just about enhancing mobile connectivity but also about enabling transformative applications that leverage 5G's high-speed, low-latency capabilities. Key areas of interest include augmented reality (AR), virtual reality (VR), and autonomous systems. In sectors such as entertainment, education, and healthcare, 5G is facilitating immersive experiences and new applications that were previously not possible with older technologies. For instance, AR and VR applications in education are providing interactive learning experiences, while telemedicine is benefiting from high-definition video consultations and remote surgeries. Additionally, autonomous vehicles and smart infrastructure are leveraging 5G for real-time data exchange and decision-making. The emphasis on these advanced use cases is driving innovation and creating new business opportunities in the 5G ecosystem. As industries explore and implement these applications, the demand for advanced 5G solutions and services is expected to grow, further propelling market expansion.

Segmental Insights

Component Insights

In 2024, The Hardware segment emerged as the dominant component in the India 5G Technology Market and is anticipated to maintain its leading position throughout the forecast period. This dominance is driven by the substantial investments required in physical infrastructure to support the rollout of 5G networks. Key hardware components include base stations, antennas, routers, and network equipment, all of which are essential for establishing and expanding 5G network coverage. The complexity and scale of 5G deployment necessitate significant hardware investments to ensure robust and reliable network performance. Telecom operators and service providers in India are focusing heavily on upgrading existing infrastructure and installing new hardware to meet the high-speed and low-latency requirements of 5G technology. Additionally, the rapid expansion of 5G infrastructure across urban and rural areas further amplifies the demand for hardware components. While software and services are crucial for network management, optimization, and user experience, the foundational role of hardware in establishing the physical network infrastructure underscores its dominant position in the

market. As the 5G rollout progresses, ongoing advancements in hardware technology and increasing investments in network equipment are expected to sustain the prominence of the hardware segment. Furthermore, the need for scalable and high-performance hardware solutions to support emerging applications and use cases, such as IoT and smart cities, reinforces the continued significance of hardware in the India 5G Technology Market. Thus, the hardware segment's pivotal role in network deployment and infrastructure development ensures its sustained dominance in the market.

Regional Insights

The Western region of India emerged as the dominant force in the 5G Technology Market and is expected to maintain its leading position throughout the forecast period. This region, which includes key states such as Maharashtra, Gujarat, and Rajasthan, benefits from a highly developed infrastructure, a robust industrial base, and a significant concentration of major metropolitan areas like Mumbai and Pune. The Western region's economic dynamism and high population density drive substantial demand for advanced telecommunications services, including 5G. The presence of numerous technology hubs, financial centers, and commercial enterprises in this area necessitates the deployment of high-speed, reliable connectivity solutions to support business operations and enhance digital experiences. Additionally, Western India's strategic location along major trade routes and its integration into global supply chains contribute to its prominence in the 5G market. The region's strong support from both state and central governments, coupled with substantial investments in telecommunications infrastructure, further reinforces its position. The rapid urbanization and growth in technology-driven sectors in Western India ensure a continuous need for advanced 5G networks to cater to the evolving demands of enterprises and consumers alike. As the 5G rollout progresses, the Western region's infrastructure readiness, coupled with its economic and demographic advantages, is likely to sustain its dominant role in the Indian 5G Technology Market. This trend underscores the importance of regional development in driving the adoption and expansion of cutting-edge technologies across the country.

Key Market Players

ZTE Corporation

IBM Corporation

Fujitsu Limited

MediaTek Inc.

Verizon Communications Inc.

Huawei Technologies Co., Ltd.

Qualcomm Technologies Inc

Samsung Electronics Co., Ltd.

Intel Corporation

Cisco Systems, Inc.

Report Scope:

In this report, the India 5G Technology Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

India 5G Technology Market, By Component:

Hardware

Services

Software

India 5G Technology Market, By Technology:

Enhanced Mobile Broadband [eMBB]

Ultra-Reliable Low Latency Communication [URLLC]

Massive Machine Type Communication [mMTC]

India 5G Technology Market, By Application:

Consumer

Enterprises

India 5G Technology Market, By Spectrum:

5G NR Sub-6GHz

5G NR mmWave

India 5G Technology Market, By Region:

North India

South India

West India

East India

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the India 5G Technology Market.

Available Customizations:

India 5G Technology Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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