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6G Market - A Global and Regional Analysis: Focus on Product, Device, Communication Infrastructure, End-Use Application, Consumer Application, Industrial and Enterprise, Material, and Region - Analysis and Forecast, 2029-2035

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Abstracts

6G Market Overview

The 6G market is projected to be $1.58 billion in 2028, and it is expected to grow at a CAGR of 103.35% and reach $1,293.19 billion by 2035. The growth in the 6G market is attributable to the high emphasis on low latency networks for specific applications and the growing adoption of internet services and edge computing devices, among others.

Introduction of 6G

6G is projected to play a vital role in optimizing the performance and efficiency of telecommunication systems in industrial and consumer applications. With the ever-growing popularity of the Internet of Things (IoT), industry 4.0, and home automation, advanced network solutions have become an essential aspect of the telecommunication industry. It involves the network and its application with a low latency rate and high data transfer techniques to enable the growth of smart technologies, automation, and artificial intelligence across different industries.

Market Introduction

The 6G market is still in its early stages of development or conceptualization, with several players involved in the market. The increasing application areas for 6G have led to the surging demand for the development of various materials such as plastics and

resins, semiconductor materials, ceramics, and composites, among others. Telecommunication network solutions and service providers, along with equipment manufacturers, have invested in research and development of advanced solutions for the 6G network to improve the efficiency, latency rate, and rate of data transfer, which in turn, can increase adoption and sales in advance telecommunication 6G market. Moreover, huge investments in the form of subsidies and infrastructure development by government and federal agencies to promote the adoption of 5G and the development of 6G are expected to further fuel the growth of the 6G market.

Industrial Impact

The 6G market is driven by several factors, such as the need for the development of new low-loss material for advanced networks, increased emphasis on satellite communication, growing adoption of internet services and edge computing devices, and growth of smart technologies.

The key players operating in the 6G market include Apple Inc., AT&T Inc., China United Network Communications Group, Huawei Technologies Co., Ltd., Intel Corporation, MediaTek Inc., Nippon Telegraph and Telephone Corporation, Nokia Corporation, Samsung Electronics Co., Ltd., SK Telecom, T-Mobile US, Inc., Telefonaktiebolaget LM Ericsson, Verizon Communications Inc., ZTE Corporation, Reliance Industries Limited, Keysight Technologies, amongst others. These companies are focusing on strategic partnerships, collaborations, and acquisitions to enhance their product offerings and expand their market presence. In conclusion, the market for 6G is projected to grow and evolve significantly because of factors such as the use of holography in communication, the role of 6G in the growth of IoT, blockchain, artificial intelligence, and UN SDGs and mobile communications.

Market Segmentation:

Segmentation 1: by End-Use Application

- Consumer Application
- Industrial and Enterprise

Industrial and Enterprise to Dominate the 6G Market (by End-Use Application)

4G technology has been crucial for the development of organizations and industries. The development of smart buildings, industries, and automation, in general, has been assisted by wireless network technology and edge computing devices. These industries now operate more simply compared to the past because of technology, which has also contributed to their growth and development. For instance, the food and agriculture industries now operate in a secure, traceable, and cutting-edge manner owing to the integration of blockchain technology and network services.

Segmentation: by Consumer Application

Mobile

M2M Communication

Computing

M2M Communication Segment to Grow at a Significant Growth Rate in the 6G Market (by Consumer Application)

Based on consumer application, the 6G market is mainly segmented into different types, namely, mobile, M2M communication, and computing. Since the rise of first-generation telecommunications standards in 1979, a new and more advanced standard has been introduced each decade. Each successive generation offers innovative services and features and improves the quality of service. Since the launch of 3G technology, mobile data traffic has increased significantly, mainly due to the development of smart gadgets and machine-to-machine connectivity. Machine-to-machine communication is the communication of two machines for the exchange of data without human interaction. Some examples of M2M communication include powerline connection (PLC), wireless communications in the Industrial Internet of Things (IIoT), and other edge computing devices.

Segmentation: by Industrial and Enterprise

Industry 4.0

Smart City and Urban Infrastructure

E-Healthcare

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Autonomous Vehicles

Others

Industry 4.0 is projected to dominate the 6G Market (by Industrial and Enterprise)

On the basis of industrial and enterprise applications, the 6G market is mainly segmented into different types, namely, Industry 4.0, smart city and urban, infrastructure, e-healthcare autonomous vehicles, and others. 6G technology is expected to accelerate the industrial revolution and achieve full digitalization, with its advantages over 5G technology. The 6G telecommunication standard is projected to incorporate features, including ultra-low latency for minimal delay time and high data transmission rates, which will be essential to complete automation in industries. Additionally, the technology is expected to utilize the terahertz communication frequency bandwidth, enabling data transport in bandwidth with less traffic.

Segmentation 2: by Product Type

Device

Communication Infrastructure

Communication Infrastructure to be the Projected to Generate More Revenue in 6G Market

The ability of communication systems to be used according to an individual's requirement has successfully attracted many new consumers. These communication systems have been developed and modified significantly from first-generation to the sixth-generation telecommunication standard. Communication system infrastructures can be further divided into fixed communication systems and wireless communication systems. With innovations in telecommunication networks, Wi-Fi technology continues to improve data transfer rates. Modern smartphones offer a feature known as a portable hotspot that allows users to access their phone's cellular data by converting their phones to a portable modem. In this way, laptops and other electronic products can relate to smartphones for accessing the internet.

Segmentation 3: by Material Type

Plastics and Resins

Ceramics and Composites

Glass

Semiconductor Materials

Others

Semiconductor Materials to be Widely Used in the 6G Market (by Material Type)

The lucrative 5G and 6G industry is enabling digital transformation, and electronics manufacturers are developing high-performance components to support reliable implementation of network technologies. Semiconductor materials, such as gallium nitride (GaN) and gallium arsenide (GaAs), are used in the fabrication of power amplifiers, transceivers, and other RF components. Companies around the world are competing for the development of 6G systems.

Segmentation 4: by Region

North America: U.S., Canada, and Mexico

Europe: Germany, Finland, Sweden, Switzerland, and Rest-of-Europe

U.K.

China

Asia-Pacific and Japan: Japan, South Korea, India, Australia, and Rest-of-Asia-Pacific and Japan

South America: Brazil and Rest-of-South America

Middle East and Africa: U.A.E. and Rest-of-Middle East and Africa

The demand for 6G materials varies according to various geographical regions. The 6G market holds a prominent share in various countries of North America, China, Europe, and Asia-Pacific and Japan. China is indeed expected to dominate the 6G market in the coming years. The region has witnessed significant growth in the telecommunication industry, driven by supportive government policies, increasing adoption of 5G networks, and advancements in technology.

Recent Developments in the 6G Market

In June 2023, Keysight Technologies introduced PathWave Advanced Design System (ADS) 2024, which can accelerate 5G mmWave product design and foresee requirements for 6G wireless communications development.

In April 2023, Telefonaktiebolaget LM Ericsson and the government of Canada announced plans to invest around $350 million in research and development centers in Ottawa, Ontario, and Montreal, Quebec facilities.

In March 2023, Resonac Holdings Corporation announced plans to start development of new semiconductor materials for 6G at the newly opened innovation base.

In February 2023, Nippon Telegraph and Telephone Corporation announced a collaboration with Telefonaktiebolaget LM Ericsson and Keysight Technologies for the expansion of 6G.

In February 2023, Nokia Corporation announced that the company had achieved two key technological milestones in 6G, with partners NTT Corporation and NTT Docomo, Inc.

Demand - Drivers, Limitations, and Opportunities

Market Demand Drivers: High Emphasis on Low Latency Network for Specific Applications

Consumers' ability to tolerate speed latencies and interruptions has deteriorated because of increased dependency on technology and communication networks. Telecommunications systems are consuming an individual's everyday activities. In certain circumstances, even a millisecond lag might negatively affect a task, notably autonomous vehicles. Service providers are working aggressively to minimize even minimal probabilities of network delay to keep themselves competitive in the market. Recent advancements in the internet's core technology have made it possible to use interactive applications, including personalized web surfing, multiplayer online gaming, audio/video conferencing, and financial trading applications. Most websites and applications require minimal latency, even though there are network restrictions for transmission of data in bulk applications. For operating remote devices, video conferencing, and streaming live events, primarily low latency is preferred, which can often be considered as less than 100 milliseconds. Effective video conferencing requires a minimum of 8 Mbps of downloading and 1.5 Mbps of uploading network bandwidth. Rapid processing, queuing, serialization, and network transfer of signals are required in many applications. The quality of the user experience is directly impacted by the responsiveness of specific applications, especially in financial and trading applications. As a result, there has been a growing demand for networking applications that have lower latency.

Market Challenges: Slower Transition from Older Communication Generation

The telecommunications sector is progressing with the emergence and deployment of next-generation network technologies. The 5G network, which was launched in 2019, is among the latest networks in the telecommunications industry. Major technical features of the network include enhanced mobile broadband, machine-to-machine communication, and ultra-reliable low-latency communications. Considering its launch in countries such as Finland, South Korea, and Japan, there are still many areas that have been lagging completely in the adoption of 5G technology. At present, all communication devices, including laptops or mobile devices, may not be compatible with the latest technologies. Consumers would be required to modify their electronic devices in order to take advantage of modern technologies in the new communication era, and this might pose some obstacles to adoption. The cost and accessibility of suitable devices can have a significant effect on the complete shift to 5G technology.

Historically, 3G technology was launched in the year 2001 by NTT Docomo, but its global adoption was seen in the year 2008. Followed by 3G technology, 4G and 5G technologies were launched in the years 2009 and 2019, respectively, but their adoption has also been somewhat slow. The primary reason for the sluggish penetration of modern telecommunication technologies is the necessity for improved infrastructure and operating requirements for next-generation networks. According to the GSM Association, 5G-based fixed wireless services were commercially launched across more than 48 countries by over 90 fixed broadband service providers by January 2023. Also, there are countries in Africa that are still trying to achieve 4G capabilities. At this rate, it is expected that most parts of the world will be able to accomplish 5G telecommunication standards by 2028.

Market Opportunities: 6G in Growth of IoT, Blockchain, and Artificial Intelligence

Artificial intelligence refers to the replication of human intelligence in machines, enabling them to perform specific tasks. On the other hand, the Internet of Things (IoT) facilitates the connection of smaller devices to larger ones via the internet. Over the past decade, the adoption of artificial intelligence and IoT-based communication devices has gained significant momentum, particularly owing to their utilization in 5G communication systems. These technologies generate data, which is then decoded to extract relevant information. However, they have faced challenges due to low data-speed rates, leading to delayed response times. The forthcoming 6G technology is poised to address these issues by enhancing the efficiency of peer-to-peer connections. With 6G, large volumes of data can be transferred through IoT devices at considerably higher speed rates, enabling real-time data analysis to be conducted more easily.

How can this report add value to an organization?

Product/Innovation Strategy: The product segment helps the reader understand the different applications of the 6G products available based on device type (mobile devices, IoT and edge-computing devices, networking devices, and others), communication infrastructure (wireless infrastructure (mobile cellular, and mobile broadband) and fixed infrastructure), material (plastics and resins, ceramics and composites, glass, semiconductor materials, and others (silica foams, and iron oxide, among others), and end-use application (consumer applications (mobile, M2M communication, IoT and edge-computing devices) and industrial and enterprise (Industry 4.0, smart city and urban infrastructure, e-healthcare, autonomous vehicles, and others)). The increasing need for low latency and high data transfer networks for better consumer experience and industrial operations is pushing the market for 6G. Therefore, the 6G business is projected to be a high-investment and high-revenue generating model.

Growth/Marketing Strategy: The 6G market is at the development or conceptualization stage and is projected to grow at a rapid pace. The market offers enormous opportunities for existing and emerging market players. Some of the strategies covered in this segment are mergers and acquisitions, partnerships and collaborations, product launches, business expansions, and investments. The strategies preferred by

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companies to maintain and strengthen their market position primarily include partnerships and collaborations followed by product development.

Competitive Strategy: The key players in the 6G market analyzed and profiled in the study include 6G manufacturers that develop, maintain, and market 6G technology services, devices, equipment, and materials. Moreover, a detailed competitive benchmarking of the players operating in the 6G market has been done to help the reader understand the ways in which players stack against each other, presenting a clear market landscape. Additionally, comprehensive competitive strategies such as partnerships, agreements, and collaborations are expected to aid the reader in understanding the untapped revenue pockets in the market.

Key Market Players and Competition Synopsis

The companies that are profiled have been selected based on inputs gathered from primary experts and analyzing company coverage, product portfolio, and market penetration.

Key Companies Profiled:

- Reliance Industries Limited.
- Keysight Technologies
- Nokia Corporation
- Samsung Electronics Co., Ltd.
- Apple Inc.
- China Unicom (Hong Kong) Limited
- AT&T Intellectual Property
- MediaTek Inc.
- SK Telecom Co., Ltd.
- Nippon Telegraph and Telephone Corporation

Telefonaktiebolaget LM Ericsson

Verizon

Huawei Technologies Co., Ltd.

Intel Corporation

ZTE Corporation

T?Mobile USA, Inc.

Resonac Holdings Corporation

Solvay

DuPont

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