

An Investigation into the Impact of 5g Network on Internet of Things

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Abstract

5G networks helps to maintain the fastest network speed in global market. Internet of things is mentioned by this network system. In recent days, several types of smart devices are available in market. For this reason, a huge volume of data is required to use those smart devices. These devices are effectively helpful for everyone to maintain a healthy lifestyle on a daily basis. 5G networks help to track people anywhere globally. Uploading and downloading speed of images, videos and films are immensely high by this particular network. Communication process is helpful for a company to communicate with stakeholders and shareholders. Modern towers are implemented in global market to maintain this 5G network system. Customers can easily enjoy the fastest speed of 5G network. Frequency of this network is immensely high, by which a company can easily attract more customers. Huge data value, frequency related issues are faced by an organisation for maintaining a 5G network. Experienced employees, operational and human resource managers are required to manage this particular network framework in a significant way. Device to device (D2D) connection process is not managed by a company. 5G network helps a company to manage this D2D connection.

Keywords

5G network, communication, frequency, globally.

INTRODUCTION

Data transfer speed increases significantly by this 5G network system. As per survey, 5G network will provide 10 times faster speed than current LTE network. Everyone can easily upload several types of images and videos on social media platforms. Internet of things (IOT) devices are useful to communicate and share data faster than ever [1]. Several types of devices are connected in a single frame by this 5G network system globally. This connection increases in a significant way by a number of contributing factors. Development work of 5G network is enhanced by a company in a simple way. Fifth generation of cellular mobile communication is helped with help of this 5G mobile network. Profitability and productivity of IOT market is enhanced by these 5G networks. 5G network helps to maintain performance and reliability of connected devices. Data transfer speed is managed by an organisation by these 5G networks [2]. This data transfer speed helps to communicate with other IOT devices globally.

In recent days several types of smart devices are available such as: smartphones, smart locks, smart refrigerators and many more. This network system helps a company to use those smart devices on a daily basis. Faster communication process is enhanced by this particular network system [3]. It helps to improve overall speed by which connected devices send and receive data and notifications related to this network framework. Healthcare and industry applications are helped by these 5G networks in an organised manner. This network helps to maintain greater network reliability to communicate with stakeholders and shareholders. Stable and reliable

connection is available globally with help of this 5G network. IOT devices are connected properly by this particular network type. In case speed of network is hampered, work process of smart devices is disturbed in workplace. Interactive electronic gadgets are known as smart devices, by which these devices can understand simple commands sent by users and help in daily activities.

MATERIALS AND METHODS

Research design

A strategy for answering several types of research questions using data related to this study. Decision making and problem-solving skills are beneficial for a researcher to maintain their work process and strategy [4]. Every researcher has a responsibility to maintain an accurate process of work for this particular research work. Several types of research designs are available such as: case study, cross sectional, experimental and descriptive research design. In this study, researcher uses cross sectional research design. This design helps a researcher to interpret several types of data related to this study.

Research approach

Methodological view of a research work is incomplete without this research approach. Research approach helps researcher to maintain a proper and relevant process of this research work [5]. Several types of meanings are gathered by researcher by this particular approach. Researcher uses an inductive research approach to finish their work in a simple manner. Relevance of hypotheses to this study is gained by a researcher by this “inductive” research approach. This

research approach helps to maintain aims and objectives of a research work. Answers of research questions are achieved during research process with help of this particular research approach.

Research types

Different methods used by a researcher to conduct this research work and these processes are referred to as a research type. Qualitative, quantitative and mixed methods are several types of research. Goals, timelines and purposes of a research work is managed by this research type [6]. In this study, a qualitative research type is used by a researcher to gather non numerical data. Narrative and descriptive account of a setting related to this research work is managed by a researcher by this qualitative research type. Numerical and non-numerical data related to this study are available globally, researcher collects only non-numerical data for this study.

Data collection methods

Data collection method is effectively beneficial for a study to gather several types of data. Researcher can collect primary and secondary data from market to finish their research work in a simple way. Hence, these individuals use secondary data collection methods to maintain authenticity and relevance of this study. Secondary data are available in several online journals, books, websites and channels. A certain amount of time and money is required for this particular study. Researcher can easily save their time and money for collecting secondary data.

Inclusion and exclusion criteria

Inclusion criteria

- Researcher collects secondary data related to this study.
- Secondary data have been collected with help of qualitative research type.
- Researcher collects data from authentic and relevant data from online journals which are published after 2019.

Exclusion criteria

- Primary data are excluded from this study by researcher to maintain authenticity of this study.
- Quantitative research types are excluded by researcher from this particular research work.
- Online journals which are published before 2019, have been excluded in this study.

RESULTS

A brief idea about 5G network on internet

5G network helps to enhance process of work in a fastest way. Wireless technology helps to deliver higher multi-Gbps peak data speed. Ultra-low latency of work is managed by this network speed. Massive network capacity is managed by a company globally to enhance their organisational and financial performance [7]. 5th generation mobile network is

known as 5G wireless network. A new kind of network helps to connect virtually everyone and everything including machines, objects and devices. Higher performance is enhanced by this 5G network speed globally. Higher network speed helps a company to enhance their speed and efficiency of work in a significant way. More capable air interface is maintained with help of this 5G network. Next generation users experience a better speed of internet by using this 5G network framework globally. 5G network helps to maintain mobile ecosystem into new realms in an organised manner [8]. Every industry should be benefited by this network system. Working process and strategy of work is maintained properly. Fastest work framework is managed by a company by this 5G network.

This 5G network helps a company to enhance global economy of a nation. In case global economic economy of a nation is enhanced, performance of an organisation is managed in a significant way. This network helps a nation to earn more profit from global market. More than \$13.1 Trillion dollars of global economic output is gained by effect of 5G network [9]. More job opportunities are created by this particular network framework. More towers and electrical setup are done by a company in market to maintain 5G network. In recent days everyone uses smartphones on a daily basis and this should be beneficial for each and every customer. Communication process plays an essential role to communicate with everybody. This process will be faster in speed by this particular network framework. 5G is used throughout three main types of connected services such as: mission-critical communications, mobile broadband and massive IOT [10]. Forward compatibility of a company is known to everyone by this process. This particular service helps to maintain flexibility and support for future, by which a company can easily understand their strengths and weaknesses.

Configuration of smartphones is effectively good because of this higher speed of network quality. In recent days, rate of google meeting and video calling increases on a daily basis. Quality of video calling and google meetings is enhanced by this better internet facility [11]. Several types of new immersive experiences are available such as: VR and AR with faster, lower latency, uniform data rates and lower cost-per-bit. These should be beneficial for all industries to communicate with their stakeholders and shareholders. Communication process helps a company to increase their rate of production. A company always tries to fulfil demand of market and customers, by which this firm earns more fame and prosperity from market. Mission of critical communications is maintained by an organisation globally to enhance experience of employees and customers by this 5G network [12]. This particular network framework helps a firm to maintain ultra-reliable transformation.

Impact of 5G network on internet of things

Internet of things (IOT) always tries to develop and expand business activity in a simple way by using this 5G network framework. Cellular networks provide a good range of

network capability. Hence this cellular network has limited bandwidth, for this reason speed of internet fluctuates. 5G network provides both advantages such as: unlimited bandwidth and better range [13]. Cellular bandwidth is enhanced with help of this 5G network system globally. A huge amount of cellular network is provided by an organisation. This network helps to maintain IOT to network in a large number. Several types of devices are connected in a single framework by this 5G network framework. In case a company connects several devices in a single network, this should be beneficial for a firm to maintain a proper process and strategy of work within workplace. Every company always tries to enhance their rate of production and profitability to maintain their performance.

5G network helps an organisation to maintain their work strategy in an organised manner. This network offers speeds ranging from 7 mbps to 17 mbps for uploading any images and videos in several social media platforms [14]. 5G network also offers 15 Gbps to 20 mbps speed in each and every sector in global market. Full length feature film is loaded in a 5G phone with HD quality in a fraction of a second. Current limitations related to network bandwidths are totally mitigated by this 5G network framework. 5G will be a game changer for internet of things going forward. Smart city and building solutions are also enhanced by this process of 5G network system. A large number of devices are connected with help of this 5G network globally. Modern technology is implemented by a company in workplace to attract more customers and suppliers [15]. Several types of modern machines are introduced in workplace to produce several types of new products.

Customers always try to grab better internet speed in their daily life, by which these individuals can easily upload any images and videos in a simple manner. 5G network helps a company to maintain usage of smart sensors. Usage of smart sensors helps a company to enhance their organisational and financial performance in global market [16]. Sometimes usage of smart sensors is not known to each and every employee in workplace, for this reason speed and efficiency of work is hampered during working hours. These individuals may not be able to provide their better performance by using smart sensors. Several types of training sessions must be provided by a company to their employees to maintain this 5G network framework. Bluetooth technology helps to track people within a certain range. However, 5G network helps to track people anywhere. Traffic control helps to maintain Artificial intelligence in a significant way. Integration of AI is maintained by a company with help of impact of 5G network on internet of things. More efficient traffic patterns are mentioned by an organisation by this particular 5G network system.

Challenges faced by a company to implement 5G network

Technology related challenges are faced by a company to implement a 5G network such as: frequency bands, MIMO technology, huge data volume, device to device communication (D2D), ultra-low latency service and

ultra-reliability network. More than 50 frequency bands are operated by this current LTE system. Unlicensed spectrum below 6GHz will be used by a company for first generation of 5G networks. Millimetre waves of RF spectrum are used to maintain 5G network in a significant way [17]. Design of hardware at millimetre waves is effectively more complex than low frequency range. Lack of coordination of 5G frequency bands creates a negative impact for maintaining a 5G network system. In recent days, advancement of technology increases on a daily basis. For this reason, a huge amount of data volume is required to maintain this particular network type. High resolution video calling, live streaming and downloading are maintained by this 5G speed of network.

In recent days, everybody tries to gather video contents compared to conventional text form. High speed network speed is required for multimedia gaming, virtual reality (VR) and augmented reality (AR) for better user experience. MIMO technology design is effectively complex in global market. Complex MIMO antenna arrays are used to deliver high speed networks to their users [18]. Number of transmitting antennas is enhanced by this idea of MIMO technology at mobile devices and base stations. Data transforming process is maintained by a company with help of this MIMO technology. Complex algorithms and device capability are required for this MIMO technology in market. User equipment and base stations require proper MIMO technology to maintain proper strategy of work within a company. Hence, every company may not be able to maintain these complex algorithms and designs of MIMO technology [19]. Wastage of power transmissions is not maintained by an organisation globally to get proper supply of data.

In recent days every country tries to use 5G network in an organised manner to enhance work process and strategy in a significant way. Usage of 5G network increases rapidly on a daily basis in each and every country globally. China and the United States are significantly ahead from other nations in their usage of 5G network globally. 5G network is available in more than 350 countries in China to use a higher speed of network [20]. 296 countries use a high speed 5G network in the United States.

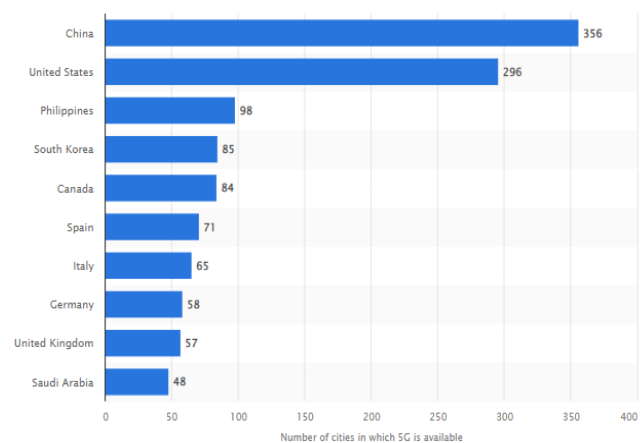


Figure 1: Availability of 5G networks in different countries

Usage of beamforming technology increases in a significant way to maintain this 5G network system. However, every industry may not be able to use this beamforming technology in market. Beamforming technology is needed in workplace to locate user's location precisely. Modern technology and machines are implemented by an organisation in workplace to manage 5G network settings and configuration [21]. Small companies cannot be able to maintain this modern technology and this company faces issues related to implementing this technology. New concept to enhance mobile connectivity by using one mobile device with help of this D2D communication. These issues create a negative impact on profitability and productivity of an organisation.

Strategies to maintain challenges for maintaining 5G network on internet of things

Every company has a responsibility to maintain frequency bands for maintaining 5G network in an organised manner. Company management team has a duty to enhance engagement of experienced employees in workplace, by which complex design and configuration of frequency bands is maintained properly. Hardware designers at millimetre waves are engaged within a company to mitigate frequency bands related issues [22]. Large volume data storage is required to provide proper data in necessary time to their users. In case, a company provides a huge data volume in global market, this company can easily attract all customers. For this reason, these individuals get proper speed of network in their daily life. High-capacity disks are used by an organisation within a workplace to maintain their work process and strategy. Analytic software is used by a company to enhance their performance globally. Vast quantities of data are used by a firm to manage this huge volume data storage.

MIMO technology design is effectively complex for each and every company in global market, by which all firms cannot be able to maintain a 5G network system in an organised manner. Experienced operational and human resource managers are needed in workplace, for this reason, a company can easily understand design of this MIMO technology. These individuals use this technology to enhance their organisational and financial performance. Company management team has a responsibility to implement MIMO antennas in several places to provide better experiences to their users [23]. Job opportunities from a company are enhanced for implementing MIMO antennas in several places. Modern machines and technologies are implemented by a company in workplace, by which a firm provides better speed of network to their customers. Base stations must be implemented by a company in a short distance by which every customer enjoys higher quality network speed in a simple manner.

Device to device communication is enhanced by an organisation in global market by this 5G network system. High level processing at base stations is managed with help of this particular network framework. Ultra-low latency service should be provided by an organisation globally for

maintaining 5G network framework [24]. A huge volume of data with an extremely low tolerance for delay is designed by this ultra-low latency in 5G network. This low latency feature helps a broadcaster to reduce delay between their viewers and broadcast. This particular feature allows them to respond quickly to their chat among stakeholders and shareholders. Network communication is also managed by a company with help of this network latency. 5G network helps a company to provide a higher speed of network system globally. More modern equipment is updated by an organisation in global market to maintain 5G network framework.

DISCUSSION

5G network plays an essential role to maintain process and strategy of a company. A fastest speed of network is provided by an organisation in workplace with help of this particular network system. Wireless technology provides better user experience to their customers in a significant way [25]. Every company always tries to maintain a strong customer base in global market. 5th generation mobile network is provided by a firm by this 5G network system. This particular network framework helps a company to maintain their organisational and financial performance in a significant way. For this reason, this firm can easily earn high profit from market. 5G network helps a company to provide better speed of network within a company. This should be beneficial for each and every company globally to maintain their profitability and productivity. In recent days everybody uses social media platforms on a daily basis. These individuals upload several types of pictures and videos on this particular platform by this 5G network.

Massive network framework is maintained by each and every company in global market. Every company always tries to provide better experiences to their customers, for this reason, a firm can earn high profit from market. Several types of working processes and strategies are available and these strategies are used by an organisation in workplace with help of this 5G network. Internet of things is managed by this particular process globally. In case every company tries to maintain a 5G network in workplace, 5G towers are needed everywhere. Several job opportunities are enhanced in global market to implement 5G tower. Proper design of 5G network service is required to maintain proper speed of this service. Uploading and downloading speed of hd pictures, videos and films are enhanced by this particular network service [26]. Users can easily enjoy high resolution videos and films in a significant way by this 5G network.

5G network helps to enhance quality of video calling and google meets globally to provide better user experience. Communication process is managed by a company by this 5G network to maintain a proper process of work. Daily progress reports of work are gained by higher authority of an organisation. 5G network helps a company to manage a paperless workplace. Sustainability of a firm is also managed by this 5G network service. Ultra lower latency, uniform data rates and lower cost per bit are managed by a firm with help

of this particular network system [27]. 5G network helps to maintain ultra-reliable transformation within a company. Impact of 5G network on internet of things is critically mentioned in this study. Cellular networks provide better network speed and capability. Speed of internet fluctuates due to lack of bandwidth of cellular networks. 5G network provides unlimited bandwidth and a better range of network capability, by which a company can manage their work process and strategy. A better communication strategy is maintained by this particular network service.

5G network helps to track any people anywhere and efficient traffic patterns are managed by this particular network service. Frequency bands, huge data volume and MIMO technology related issues are faced by an organisation during working hours [28]. Current LTE system is operated by a company; hence this particular network service is effectively beneficial for a firm to enhance their profitability and productivity. In case a company tries to maintain a 5G network, millimetre waves should be managed by a firm globally. Lack of coordination of 5G frequency bands creates a negative impact on financial conditions. Sometimes technology related issues are faced by a company for maintaining 5G networks. Proper design and configuration of this network is not known to everyone during workplace. Experienced operational managers and employees are needed in workplace to understand proper configuration of 5G network.

CONCLUSION

5th generation of mobile networks is known as 5G network service globally. The fastest network speed is provided by a company in market. 5G network helps a company to maintain internet of things in global market. Data transfer speed is managed by this particular network type. 5G network helps to manage uploading and downloading speed of images and videos in market. Several types of devices are connected in a single frame by this particular 5G network. In recent days everybody uses social media platforms on a daily basis. Higher speed of network is needed to maintain this network service. In this study, researcher uses research design, approach and type to finish their work within a given deadline.

Cross Sectional research design has been used by a researcher to maintain proper strategy of research work. Researcher uses an inductive research approach to gather in depth knowledge related to this study. Coherent and logical way of research work is maintained by a researcher. Secondary data are collected by qualitative research type. Time and money related to this study is managed by an individual. Importance and impact of 5G network is critically discussed in this study. Several types of challenges and mitigation process of those challenges are critically evaluated here. For this reason, this study should be beneficial for each and every company in future.

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