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## 5G-TECHNOLOGY: SOCIAL ADVANTAGES AND THREATS

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The development of information technology in the modern world is one of the most important factors that significantly affects the pace and achievement of scientific and technological progress. All spheres of human activity are considered only depending on the ways of information exchange, whose importance is constantly growing.

5G is the fifth generation of wireless network. It will be based upon the combination of the existing wireless technologies like GSM, Wi-Fi, LTE etc and the new radio access technologies. Most people can do their own works within seconds with new technology. 5th generation technology comes with many features that are beneficial for all group of people including, students, professionals (doctors, engineers, teachers, governing bodies, administrative bodies, etc.).

The first 5G networks launched in 2019, reaching 5% of the population. Services based on them were provided mainly in metropolitan areas, and the largest coverage was created in the USA, China, South Korea and Switzerland. At the end of 2019 in South Korea operators provided 5G access to most of the country's population and in Switzerland - to 90%. In 2020, the 5G standard has significantly strengthened its position - by the end of the year, 5G technologies will be available to 1 billion people, that is, 15% of the world's population. COVID-19 pandemic has had a negative impact on 5G development because of forcing a huge number of people to stay at home for most of 2020, where home network connectivity is available.

Today, the highest demand for 5G services is in Northeast Asia, where the huge population of China is located. Demand in China is driven by regulatory policy, competition between telecom operators and the availability of various models of affordable 5G smartphones. However, in the coming years, the lead in terms of 5G-technology implementation will belong to another region - North America, where this indicator will reach 80% in 2026. North America's leadership results from the US approach to 5G deployments.

5G technology has both positive and negative aspects of implementation in society:

- the emergence of a large number of devices that work on the principle of «always online» relevant for each user and specific devices. This

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means that if the mobile Internet users in a particular area, which is served by a certain number of antennas, data transmission will be carried out on a narrow channel, which will increase the speed and volume of transmitted data.

- availability of basic infrastructure for the Internet of Things. Device-to-device technology - the essence is that if the devices are located in the immediate proximity (up to hundred of meters), the mobile operator will pass only signal traffic to charge for services, and the transfer of information and data will take place directly between devices.

- Dependence on leading networks and hardware video terminals will disappear and even more participants will be able to get a quality picture and greater opportunities for interaction.

In addition to significant advantages in the widespread introduction of 5G technologies, there are a number of significant disadvantages.

Firstly, it is still under research, 5G is unsupported technology. Many old devices would not be competent to 5G network, therefore people have to replace their devices with 5G supported devices, It may cost some much money.

- **BATTERY DRAIN ON DEVICES.** When it comes to cellular devices connected to 5G, it seems the batteries are not able to operate for a significant period of time. The battery technology needs to advance to allow for this enhanced connectivity, where a single charge will power a cellphone for a full day. Alongside depleted batteries, users are reporting that cellphones are getting increasingly hot when operating on 5G.

- **INITIAL COSTS FOR ROLLOUT ARE HIGH.** Several parts of the world may not allow huge speed increase, there are radio signal problems, High-cost investment for developing infrastructure, 5G network has security & privacy issues, 5G technology requires skilled engineers to install & maintain 5G network, 5G equipment are costly, This increases the cost of 5G deployment & maintenance phases, and 5G smartphones will be costly.

- **OBSTRUCTIONS CAN IMPACT CONNECTIVITY.** The range of 5G connectivity is not great as the frequency waves are only able to travel a short distance. Added to this setback is the fact that 5G frequency is interrupted by physical obstructions such as trees, towers, walls and buildings. The obtrusions will either block, disrupt or absorb the high-frequency signals. To counter this setback, the telecom industry is extending existing cell towers to increase the broadcast distance.

- **LIMITATIONS OF RURAL ACCESS.** While 5G might bring about real connectivity for the predominantly urban areas, those living in the rural

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settings will not necessarily benefit from the connection. As it stands, many remote areas countrywide are not able to access any form of cellular connectivity. The 5G carriers are going to target big cities with larger populations, eventually working their way into the outer areas, but it's not likely this will be happening any time soon. As a result, only some of the population will benefit from 5G communication.

3G cell towers could cover immense territory with relatively few cells because the network did not require as much bandwidth, meaning networks had to deploy fewer cells. When technology progressed to 4G networks, the cells were producing more bandwidth, so, the coverage radius of each cell was smaller.

People may have noticed that their coverage may going more often than on their 3G network. As the 5G network gets rolled out, more cell towers will be required to produce this immense bandwidth because the cell towers can't cover as much space like the 3G or 4G cells, More cell towers will need to be rolled out. Therefore, 5G users should expect that their coverage might not be as widespread at first.

Deployment of 5G networks, business models of operators and specific scenarios are still at an early stage of development even in advanced consumer markets. 5G technology not only provides new opportunities for operators, but also provides a significant expansion of the range of services for users.

Many countries have recognized the strategic importance of 5G wireless and have developed national development plans to help deploy new 5G networks promptly, as well as to stimulate the emergence of new services. At the same time, special attention is paid to focusing on the specific needs of the local market. Such initiatives may include the establishment of high-level committees to adopt the regulatory framework and sponsor national test sites for 5G testing.

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4G mobile wireless technology is being introduced throughout Ukraine. The deployment of 5G technology is a matter of the near future, it is under testing and development.

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