

5G INTERNET. THE PROSPECT OF ITS DEVELOPMENT IN BELARUS

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Annotation. In this paper, we have considered the prospects for the development of 5G in our country and abroad. At the beginning of the work, brief historical information about the development of mobile communication generations is written. Then, the 4G and 5G performance was compared. 5G has replaced 4G with improved transmission speed, network coverage, and reliability. 5G works with other antennas and frequencies, gives Internet access to more devices, minimizes data transmission delays, and provides ultra-fast speed. Paragraph 2 is devoted to the problems that can be encountered when implementing 5G. Such problems include: permitting and planning procedures, lengthy negotiations and procurement procedures, high tallages, the danger of deepening the digital gap. Then you can learn about 5G testing abroad, as well as the success of testing from different phone companies in our country. Caution should be exercised in proving the commercial viability of 5G technology and its real priority for economic development. The decision to invest in 5G networks should be supported by a reliable investment analysis.

Keywords. generation, communication, speeds, development, operation, transmission, viability, investment analysis.

Introduction. Since 1991, the development of cellular communication has spun at a furious pace. New mobile operators begun to open up all over the world, investing serious financial resources in the development of new technologies. Thanks to this, in 1999, the GPRS packet data transmission standard was released and millions of cell phone owners got access to the mobile Internet.

In 2000, the third generation of 3G mobile communication was launched, which is still widely used today. 3G communication is based on packet data transmission with a speed of 3.6 Mbit/s.

The transition stage of the fourth generation of mobile communications, better known as 4G, was the HSDPA protocol, which began to be implemented in 2006. This protocol significantly increased the data transfer rate in mobile networks, the limit of which was equal to 42 Mbit/s.

Currently, the issue of implementing the 5G mobile communication standard is relevant.

1. Features of the fifth generation of mobile communications.

5G — the fifth generation of mobile communications, operating on the basis of telecommunications standards (5G/IMT-2020), following the existing 4G/IMT-Advanced standards.

The modernization of the existing network was necessary because the number of devices that require an Internet connection is constantly growing. To function properly, many devices need network bandwidth, which 4G can no longer cope with.

5G has replaced 4G with improved transmission speed, network coverage, and reliability.

5G works with other antennas and frequencies, gives Internet access to more devices, minimizes data transmission delays, and provides ultra-fast speed. Fifth-generation networks make it possible to create a huge number of connections - up to a million per square kilometer, while providing high reliability and low signal latency. High speeds of 5G will be enough for the full development of complex urban solutions, things which are based on the Internet increasingly used for smart homes, buildings and businesses. 5G will bring self-driving cars, cloud gaming and holographic communication to our life. The new standard will also allow the so-called tactile Internet to develop during minimal data transmission.

In fact, 5G is a revolution in the reception, transmission and control of information. These technologies have transformative potential for citizens, businesses, governments and the economics of a country.

2. Problems of implementing fifth-generation networks.

When implementing fifth-generation networks, you will face such problems as:

- permitting and planning procedures. The procedure for local government approval of 5G implementation plans can take 18 to 24 months, leading to delays.
- lengthy negotiations and procurement procedures. Only after lengthy procurement procedures lasting from 6 to 18 months, local authorities grant wireless service providers exclusive rights to install small cell equipment on outdoor equipment, which leads to additional time and cost.
- high tallages and charges for access to outdoor equipment.
- human exposure to radio frequency electromagnetic fields (EMF)
- the danger of deepening the digital gap.

3. Testing 5G networks

Officially, the first company to take the first step in the development of 5G is the Chinese company ZTE (Zhong Telecommunications Equipment), which in June 2014 was the first supplier to offer the Pre-5G concept, and in March 2015, the company launched a Pre-5G base station in Barcelona. Today, almost all countries are testing 5G Internet, but it happens at different speeds. Thanks to the creation of a 5G network with high bandwidth and low latency in the Chinese port of Tianjin, the ZTE «Smart Port» project has already been implemented (Picture 2):

4. Prospects for the introduction of fifth-generation networks in Belarus.

Belarus has already launched pilot 5G zones in Belarus, of course, their coverage is not great – several streets in the city of Minsk, but the test result is impressive - the download speed was more than 1 gigabit per second.

Our country has every chance to become one of the countries that will soon begin full-fledged commercial operation of a new generation of data transmission. Regarding the prospects of 5G in Belarus, I will give the opinion of the chairman of the Board of the Association of Information and Communication Technology Organizations "Belinfocom" Andrey Nareiko: "Now the head of the country is deciding on the strategy of implementing 5G in the development of a digital society and building a digital economy. Our Association, which includes the largest national mobile network operators, has established a working group with representatives from all stakeholders to suggest principles and models of such implementation, and to prepare recommendations for appropriate changes in legislation".

In conclusion, 5G networks will play a key role in the digital economy, accelerating economic growth, improving the quality of life of citizens and creating new business opportunities. But despite all these advantages, caution should be exercised in proving the commercial viability of 5G technology and its real priority for economic development. The decision to invest in 5G networks should be supported by a reliable investment analysis.

References

1. The report "Preparing for the implementation of 5G Opportunities and Challenges" 2018, prepared under the guidance of Mr. Kemal Huseynovich, Head of the Department of Infrastructure, Enabling Environment and Electronic Applications of the ITU BDT
2. Volozhek I. Article " Soon there will be a new mobile communication-5G. What will it change? " 2019 [Electronic resource].
3. Article "5G Prospects in Belarus Expert opinions" 2019 [Electronic resource].
4. Article "5G (the fifth generation of mobile communication) "