THE CONCEPT OF TELECOMMUNICATIONS AND THEIR ROLE IN THE MODERN WORLD

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Annotation*: Telecommunication networks and their communication channels are considered.*

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What is meant by the term telecommunications? It's simple, telecommunications is usually understood as the whole range of technical means that are designed to transmit information over any distance. This set of technical means includes: sound, signal, text, sign, written image and many other types. All these means are transmitted via cable, optical, radio and other electromagnetic systems.

The system of technical means by which telecommunications is carried out is called a telecommunications network. The telecommunication network has one of the important characteristics of the entire technology under consideration: it provides an opportunity to obtain the necessary information or data to ensure the activities of any telecommunications participants or to meet the personal needs of users.

Telecommunications technical means include: equipment and machines used for data processing that transmit or receive telecommunications messages.

Participants in telecommunications activities include:

legal entities and individuals of the state, as well as foreign legal entities and individuals who can provide services in this area;

The authorized body is the body that regulates the activities carried out in the field under consideration - in the field of telecommunications;

users of telecommunications services.

Although nowadays telecommunication networks are quite developed and very relevant, but we must not forget that our society is developing daily, different knowledge is increasing every day, and therefore science does not stand in one place and will never stand. Thus, telecommunications are also keeping up with the times and I would like to list promising areas of telecommunications technology:

creation of intelligent antenna devices with improved energy;

creation of telecommunication systems in a very small wavelength range (~ 1mm) with an operating frequency that will reach up to 100 GHz;

creation of new signal-code structures by combining signal manipulation methods and new signal coding methods in order to increase the transmission capacity of transmission systems and improve their energy efficiency;

the development of new methods for the design and manufacture of telecommunications equipment, which ensures the emergence of more powerful machines that will perform a huge number of tasks.

Also, do not forget that telecommunications have long been a part of the world of computer technology. And perhaps, in the near future, he will soon fully immerse himself in this world. With television, this process is already in full swing. Most countries use digital broadcasting, which will rapidly replace analog broadcasting. The telecommunications industry also earns good money by selling digital set-top boxes for conventional televisions, and gets the opportunity to make some television channels on a paid basis, as in satellite broadcasting.

And this is not all the prospects for the future in this direction! As you have noticed, telecommunications is very closely connected with other scientific fields, such as physics, energy, electronics, computer science, and soon networks will cover even more industries.

Now let's return to the structure of our telecommunications. Telecommunication networks have certain channels for remote communication. According to the principle of operation, these channels are divided into:

simplex or one-way - transmitting data, but not receiving information.

Communication channels are also divided into different types based on implementation:

wireless;

fiber-optic;

wired.

According to the environment of placement and existence, in addition to space channels, there are underwater (intercontinental cables on the ocean floor), underground (buried cables), terrestrial (poles with wires) and aerial (radio waves). According to the technology used, they are continuous and discrete (analog and digital). Communication channels in telecommunication technologies have been sorted out. Now we need to figure out the networks themselves. I have already mentioned the term telecommunications network a little above, but now we need to understand this concept more deeply.

Telecommunication networks are divided into 3 main types according to their scale:

Local - Local Area Network (LAN): This type connects subscribers who are not very far from each other.

Regional - Metropolitan Area Network (MAN): this type connects subscribers of cities or even countries. The most striking example of this type is the network structure of a mobile operator.

Global - Wide Area Network (WAN): This type connects subscribers of countries and continents. This includes satellite communications, radio communications,

telephone networks and, of course, the beloved Internet, which has become an integral part of our lives.

It is impossible not to say a few words about the aforementioned network - the INTERNET. This computer network is the largest in terms of the number of regional nodes and the number of users around the globe. The users served by this network reach the mark of 30 million people. Almost all currently existing information services are available in this network. The National Science Foundation of the USA provides organizational and financial support to the INTERNET, intended mainly for solving research and educational tasks.

Types of telecommunication technologies

Telecommunication technologies can be considered as services provided by providers of various levels.

According to this principle, the following types of telecommunication technologies can be distinguished:

telephone communication, modern telephone communication makes it easy to switch from an analog standard to a digital one, connect landlines to the Internet and connect analog and mobile devices to one network;

radio communication, which has now turned into cellular communication, the phone, moving within the network, finds itself in the range of various transmitting devices;

satellite communications, which is used by providers to create mobile communication systems and for government communication systems;

The Internet is the most common type of telecommunications technology, in which connection to the network can be carried out both wirelessly and wirelessly.

Technical and software tools of telecommunication technologies

The efficiency of the Internet is based on the use of network nodes and communication channels. Nodes include both individual computers and hosting companies that provide IP addresses and domain names.

Communication channels are generally divided into 4 types:

analog telephone networks;

Among the communications used to organize communications, it is possible to separately note programs that ensure the operation of telecommunications equipment such as:

IP ATE;

routers;

computers.

Separately, it is necessary to name application programs that simplify the work with processing arrays of information.

Telecommunications technology software

Special software is used to transfer data using the capabilities of telecommunication technologies. This software operates according to certain

protocols or mechanisms designed to simplify and standardize the work of all network nodes, building it according to a single algorithm.

So, for transmission over computer networks, the MIME standard (ssr-Multipurpose Internet Mail Extensions) has been developed, which translates data into a format understandable to the mail server. Communication between the user's computer and the server takes place in the form of a Client-Server dialogue, where a certain program is a participant on each side.

Separate programs are used for the operation of messengers that allow you to exchange messages, make phone calls with voice and video information. Not only the computer - mail server is communicating here, but telephone exchanges are also connected to the dialogue.

Network telecommunication technologies

Various network telecommunication technologies allow us to solve such tasks as:

transfer of information in the required formats;

building communications;

ensuring the interaction of various network participants.

Information security technologies in telecommunication networks

Most of the information arrays belonging to government agencies and commercial enterprises have independent value and are prey for potential kidnappers, who may be hackers and internal users.

To protect information from leaks, sophisticated software products have been developed to detect and block the penetration of an unauthorized user or an information-stealing virus into the network.

There are special information security standards, but even they cannot always protect networks from hacking and data theft. Computers and mobile devices of private users using only antiviruses are particularly vulnerable.

The use of telecommunication technologies

Telecommunication technologies today are mainly used for the organization of communication systems.

But the communication systems themselves are of practical importance, with the help of these technologies it is possible to achieve significantly more important goals, including:

creation of distance learning systems;

providing low-cost voice telephone service;

creation of information systems of enterprises and their integration into a complex that allows to optimize management;

building banking networks;

conducting electronic auctions and tenders to ensure public procurement;

implementation of communication of remote subjects;

for online trading;

implementation of remote control in the public and private spheres.

The range of possibilities for using telecommunication technologies is expanding every day. It is difficult to say what exactly will be offered tomorrow in this area to make communication more accessible and production processes easier.

Development of telecommunication technologies

The emergence of a new science, telematics, made it possible to use the opportunity to transmit information data at a distance. Science is based on a system that combines telecommunications and computer science. This property has significantly increased the territory of the communication participants.

A characteristic feature of information technology is that the only product used in the workflow is information. The process of intelligent processing facilitates the collection, storage and dissemination of information data.

Modern information and telecommunication technologies

Telecommunication technologies involve the use of information networks and computer technology.

A network-wide resource is represented by hardware type, information developments, software, the following requirements are important for them:

computer equipment of various networks connects automatically;

each piece of computer equipment is a component of the network, but it also works in an independent mode;

Communication is provided by telephone, fiber-optic connection and satellite channels.

Telecommunication technologies in education

Our life takes place in an information society, so we should learn new telecommunications technologies from childhood.

In the educational system, they are used for distance learning, virtual communication, self-education, and obtaining the necessary information.

The developed federal target program aimed at the development of the educational information environment has become a prerequisite for its implementation in the field of education and science.

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