CONTEMPORARY FLOW OF INFORMATION AND DEVELOPMENT OF COMPUTERS

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Annotation: The article talks about the high-speed development of modern science and technology and the increase in information flows, the history of the creation of computers, their role in human life, and the use of computers in storing and transmitting information. The modern era is characterized by the rapid development of science and technology and the increase in the flow of information. Nowadays, it is impossible to find a field of science and technology, as well as our everyday life, where personal electronic computing machines-computers are not used.

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Academician V.M. Glushkov, one of the founders of electronic calculators, wrote: "If there were no modern EHMs, one half of humanity would have to serve the other half to perform calculations in production and household." In the beginning, this person had hands and fingers. The ancient Greeks and Romans were the first to use finger counting. A complete explanation of finger counting was given in the scientific work "On Calculation" by Poshchenni in the Middle Ages (approx. 673-735). Life demanded the storage of information. The first people achieved this by using the help of stones, pieces of wood, sticks, ropes with knots... Finally, in order to store and use information, it became necessary to mark them and create numbers. Of course, people have created a positionless number system before. 4000 years ago, the Egyptians used hieroglyphs, later the Greeks used the letters of the Greek alphabet we use today, and the Romans used I (one), V (five), X (ten), L (fifty), C (hundred), D (five hundred) and They used M (min) signs. However, until the 50s of the 20th century, the abacus, which was used especially by accountants and was colloquially called a "brush", did not have the property of automatic calculation. Therefore, we think it would be a mistake to call it the predecessor of the computer, since it does not have the automatic calculation property that plays a defining role for the computer. 2012 141 The abacus was a mechanical device created in the fourth millennium BC. At first, it consisted of clay plates with a hole in the middle, which were mounted on horizontal clay shafts. Clay plates were made in small circles and represented numbers. The Asian continent is considered its first creator. In the Middle Ages in Europe, the abacus was replaced by a tabulated table. Numbers were calculated along certain lines. In the 17th century, a more improved form of it was created, that is, it consisted of round (circular) wooden sleepers with a hole in the middle, transferred to iron shafts in accordance with the position of the decimal numbers. Each mile had ten overs, and the last mile had five overs, and this was used to calculate the decimal part of the number. This mechanical device was used until the 40s of the 20th century. According to historical data, numbers were created before letters. Written calculation using Arabic numerals was explained in the book published in 1202 by L. Pisanski, known as Fibonacci in Europe. From this period, written calculation began to spread widely, and the abacus became only an auxiliary tool, a tool. In general, writing is the most suitable method for storing information. A significant event in the history of mathematics is the discovery of the positional number system. The discovery of the positional number system made it possible to mechanize calculation.

The first change in computing tools took place at the beginning of the 17th century. In 1617, the Scottish mathematician J. Naper made a device called "Calculating sticks" that performed multiplication, and a logarithm ruler was created. The creation of the first mechanical summing

machine is associated with the name of the French scientist B. Pascal. In 1673, the German mathematician V. Leibinis developed a mechanical machine that performs calculations. At the beginning of the 19th century, the outstanding mathematician Ch. Babbitt developed the idea of a mechanical calculator controlled by a program and determined that the calculator has: 1. "Memory" for storing numerical information (a memory device in modern computers): 2. A device that performs operations on numbers in memory (accounting device in a modern computer): 3. Writing, reading, and regulating the sequence of operations on them (control device): 4. An (input-output) device that allows entering information into the machine and printing the result of the calculation. Of course, this idea should be EHM s are performed after creation. The history of EHM is connected with the name of Babbage, and the history of programming with the name of his student, daughter of George Byron, Augusta Ada Lovelace. In the 30s and 50s of the 20th century, scientific discoveries in the field of electronics, automation and mathematical logic created conditions for the creation of the first electronic computing machines. In 1937, an electronic calculator was created in the United States to solve mathematical physics problems of the Bulgarian A. Atanosov. The world's first electronic calculator - "ENIAK" (Electronic Numerical Integrator And Calculator) was created in 1946 by J. Mochli and D. Eckert, employees of the American University of Pennsylvania. This EHM, which performed 5000 operations per second and consisted of 18000 lamps, weighed 30 tons. The American mathematician John von Neumann, who had special services in the development of EHM, played an important role in the principle of "using the binary number system and storing the program in memory", which is also used in modern computers. In 1947, under the leadership of Mochli, Eckert and Neumann, the "EDVAK" machine was developed. In the same year, employees of the US IBM company developed a new electronic-relay calculator. Under the leadership of the Russian scientist S. Lebedev, in 1950, a Small Electronic Computing Machine consisting of 2,000 electronic lamps was prepared, and a year later, a Large Electronic Computing Machine, which performed 8,000 operations per second, was prepared. "STRELA" (1963) and "URAL" (1964) branded machines were put into use. Although the tasks of EHM elements, which perform the simplest functions and are composed of a large number of electronic components, have not changed, the set of elements of which they are built has changed. With the change of the element base, the indicators, appearance, and capabilities of electronic calculators changed significantly. No device discovered had developed as rapidly as EHM. Every 10-15 years there have been sharp leaps in the development of EHMs. The new EHMs created as a result of such leaps suppressed and eliminated the old ones. Therefore, it is appropriate to consider successive generations of EHM. Generation I (1950-1959) computers were built on electronic lamp elements, so they had low reliability, memory capacity, and operating speed. The functional limitations of input-output devices and external memory made it difficult to process text (character-type) information. Therefore, the field of application of computers was limited and was mainly used for solving mathematical problems. The element base of second generation (1960-1969) computers consisted mainly of semiconductors, the memory capacity, operating speed and reliability of the equipment were relatively high. Input-output devices have been improved, large-capacity external memory (on magnetic tape) has been connected, and text information processing has become possible. The parallel operation of external devices and main devices was partially solved.

Using algorithmic languages made the programming process much easier. The fields of application of computers have expanded relatively. It was during this period, that is, in the late 1960s, that for the first time in the world, the Library of Congress in the United States implemented the MARC system in its computer database. The third generation (1970-1985 years) was the foundation for the creation of a new element base - microelectronics and integrated circuits. As a result of their use, the overall dimensions of computers have decreased and the work reliability has increased. The principles of parallel operation of devices were further improved. As a result, it became possible to use an asynchronous switchable structure, and it

became possible to execute several programs at the same time (multiprogram mode). Organization of information exchange between main devices and external devices on dynamic principles allowed to connect different number and different types of external devices to the computer. In addition to the large memory capacity, the use of a magnetic disk with a high read-write speed as an external memory was realized for the first time with III generation computers. One of the main characteristics of the third generation computers was the joint use of hardware and software tools in the organization of the computing process. Operating systems were used to simplify information processing and programming and increase efficiency. As a result, the role of software tools has increased significantly. The IV generation includes computers created with large and very large integrated circuit (BIS, SBIS) technology from 1981 to the present. In such integrated circuits, it is possible to place up to 1000 circuits in one semiconductor crystal, that is, one BIS could perform the functions performed by tens of hundreds of conventional circuits. Therefore, the dimensions of the fourth generation computers are much smaller (10-100 times), and their reliability is high. While the practical (active) memory in the previous generation computers was built in magnetic cores, in the IV generation computers the practical memory (static and dynamic memory) was built in integrated circuits. With this, the working speed and capacity of the working memory has increased significantly. Micro and mini computers occupy a special place among IV generation machines. The most common type of microcomputers are personal computers. Personal computers are a separate class of IV generation computers. The creation, mass production and application of personal computers is considered a revolutionary achievement in computer technology. There are several reasons for this: • personal computers are much smaller in size (desktop) and cheaper in price; • it does not lag behind the previous generation (III) computers in terms of its technical indicators and capabilities; While the previous generation of computers could be used mainly by professionals (programmers, electronic engineers, operators), personal computers are used by everyone (masses); • personal computers are very reliable and it is very convenient to communicate with them in the form of dialogue. Currently, hundreds of millions of personal computers are used worldwide in science, industry, education and home. Personal computers and their software are based on the principle of open architecture, are improved every year and their application is further expanded. V and subsequent generations - the computers of today and the future, that is, assembled with more miniature elements with electronic technologies, must meet new functional requirements in terms of quality, in addition to having higher productivity and reliability. As we can see, as the world develops, as society forms, more and more information flow is created, and to cope with this information flow is developing and is being done in EHM, which we widely use to maintain it. In this entire field of development, it becomes easier to store and transfer information, and as V.M. Glushkov mentioned earlier, one half of humanity is no longer obliged to serve the other half.

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