

To the 90th Anniversary of Academician V.M. Glushkov's Birthday

Victor Mikhailovich Glushkov is the outstanding cybernetics scientist. He viewed cybernetics as the art of control, i.e., the science about general laws of data receiving, storage, transmission and transformation in complex controlling systems. Therewith, by controlling systems are meant not only technical, biological systems, but also any administrative and social systems.



V.M. Glushkov was born on August 24, 1923 in Rostov on Don. After finishing secondary school V.M. Glushkov entered the heat engineering faculty of Novocherkassk Industrial University. However, after studying there for four years Victor Mikhailovich realized that he was interested in sciences of mathematical profile rather than thermal physics, and in 1947 he entered the 5th course of physical and mathematical department of Rostov University. V.M. Glushkov graduated from both universities in parallel and had degrees on higher technical and higher mathematical education.

In autumn 1949 V.M. Glushkov began his teaching and research activity in the walls on Ural Forest-Technical University. At the suggestion of professor of Sverdlovsk University S.N. Chernikov he took his postgraduate course by correspondence and plunged into investigating the matters in quite new for him branch of mathematical science — group theory. In 1951 he successfully defended Candidate's dissertation.

At World Mathematical Congress the prominent German mathematician David Hilbert formulated 23 the most significant and complex mathematical problems. Victor Mikhailovich was engaged in the fifth generalized one. In December 1955 after finishing the doctoral-level program at Moscow University Victor Mikhailovich successfully defended his Doctor's degree on the theme "Topological locally nilpotent groups".

In August 1956 Victor Mikhailovich accepted the proposal of director of Institute of Mathematics of AS of Ukraine, Academician of AS of UkrSSR Boris Vladimirovich Gnedenko and headed the laboratory of computer engineering and mathematics at the Institute of Mathematics of AS of Ukraine.

V.M. Glushkov developed his own principles of leadership, which he subsequently pursued over all his life. The first principle: the unity of theory and practice. Victor Mikhailovich supplemented it with a new sense: “One must not start the practical work whatever important it seemed without its preliminary theoretical comprehension and definition of its prospects. It could be unnecessary to deal with this concrete work, but to do something that is more general which afterwards would cover this work and tens and thousands of new applications”.

The second principle: the integrity of the remote and nearest goals. From V.M. Glushkov’s perspective, in a new science like cybernetics one should not take up any specific nearest problem not seeing further prospects of its development. And on the contrary, one cannot ever deal with an advanced large development without its preliminary split into stages such that each stage on the one hand, would be a step in direction of this significant goal and in addition, by itself would represent a self-reliant result and bring a concrete benefit.

The third principle: responsibility decentralization. “I separate areas, appoint scientific managers (deputies and others responsible for scientific directions) and try to minimize my intermeddling. Even if I see that something wrong is being done I would rather use some integral index for correction than make any concrete adjustment”.

The sequential application of these rules was one of the factors which allowed V.M. Glushkov not only to create the largest Institute of Cybernetics but to turn it into the leading scientific center of the world scale. In parallel to this he succeeded as the organizer and science head of several research institutes under different ministries concerned with the implementation of automated control systems.

In 1957 there was implemented the Decision made in 1955 by Central Committee of CPSS and Soviet Ministry of SSSR on creation of computing centers in academies of union republics, and the laboratory of computer science and mathematics at the Institute of Mathematics of Academy of Sciences of Ukraine was transformed into Computation Center of Academy of Sciences of Ukraine as the independent unit with further transformation into Institute of Cybernetics — the main scientific basis of cybernetic research in Ukraine. It became the leading Cybernetic center of the Soviet Union.

In 1958 V.M. Glushkov was elected the Corresponding Member of Academy of Sciences of UkrSSR in speciality “Algebra”, and in 1961 — the Academician of AS of UkrSSR in speciality “Computing mathematics and engineering”.

His first book “Theory of algorithms” was published in 1961. Entirely succeeded in the problem of digital automaton theory Victor Mikhailovich offered his well-reasoned concepts in his monograph “Synthesis of digital automatons” published in 1962. In 1964 for the series of works on the theory of digital automatons V.M. Glushkov was awarded Lenin prize. In the same year he was elected Academician of Academy of Sciences of USSR.

Victor Mikhailovich was a founder and editor in chief of scientific and theoretical journal “Kibernetika” which won the recognition around the world.

In 1965 the mechanical and mathematical faculty of Kiev Taras Shevchenko University set up the department of theoretical cybernetics which was headed by V.M. Glushkov. In 1969 initiated by V.M. Glushkov the cybernetics faculty was created at the university and a computer engineering specialization — at Kiev Polytechnical Institute.

V.M. Glushkov united Ukrainian scientists for the purpose of creating the first computing machines. The machine MIR-1 was the first soviet computer with entire mathematical software. It was widely used in many institutions and organizations. In 1969 the serial computer MIR-2 was developed followed by the design of MIR-3 with higher operation speed and developed input language. MIRs became the prototypes of modern computers.

In 1967 Institute of cybernetics set up the department of theoretical cybernetics and system analysis of Moscow Physical and Technical University. It was headed by V.M. Glushkov. Students of senior courses were concerned with special assignments relevant to research themes.

The year of 1967 was marked by the start of creation of Cybernetic Center of Academy of Sciences of Ukrainian SSR, which was successfully completed. Currently Cybernetic Center comprises V.M. Glushkov Institute of Cybernetics as the base organization, Institute of Mathematical Machines and Systems, Institute of Program Systems, Institute of Space Research, Institute of Applied Systems Analysis and International Scientific-Training Center of Information Technologies and Systems.

The year of 1969 proved to be the highlight of the life of V.M. Glushkov and the staff that he headed. For great advances in science development and scientific personnel training Institute of Cybernetics of AS of UkrSSR was given Lenin order, and his Director, Academician V.M. Glushkov was given the rank of Hero of Socialist Labour and presented with Lenin order and Golden medal "Hammer and sickle".

V.M. Glushkov created the theory of digital automatons, discrete transformers, macroconveyor computations, laid mathematical foundations of advanced technologies in programming and algebra of algorithms. He was in charge of development of the series of domestic patterns of computing machinery and control systems based on a computer, the development of new technologies of machine design and their element base production, program-technological complexes and systems of data processing. A special place was given to research in the field of artificial intelligence. His basic efforts were focused on development of the theory of discrete self-organized systems, the problem of mental operation automation, automated proof of theorems.

V.M. Glushkov offered the program of creating the state automated system of information collection and processing so as to make account of planning and control of national economy of the country and union republics and also the state system of computation centers (SSCC). From the scientist's perspective the implementation of these large-scale innovations would trigger radical changes in management and ensure a transition to paper free technology of production control.

Academician Glushkov is the author of more than 700 publications. He raised the generation of pupils and followers, set up the world-known scientific school. Among his pupils there are the prominent specialists, laureates of state prizes, honorary scientists, academicians. He turned a small laboratory, where 60 men worked, into a large cybernetic center with the staff of 6000 persons where 100 doctors and 500 candidates of science were brought up.

Victor Mikhailovich was the outstanding personality. He was a person of great erudition, high culture, great intellect. He had an extreme fantasy and desire to comprehend entirely the problem, the state view when selecting the object of his skills application, great passion for work and ability to develop his colleagues' and pupils' enthusiasm for his ideas that triggered the interests to their practical implementation.

15 years later after the death of V.M. Glushkov in 1997 International Computer Society awarded him the medal "Pioneer of computer machines" giving him a credit for creating the first in USSR Institute of Cybernetics of NAS of Ukraine, creation of the theory of digital automatons, the architectures of computing systems, highly efficient recursive macroconveyor processor.

V.M. Glushkov was one of the outstanding scientists of his time. He served the matter which is of great priceless value for acceleration of scientific and technological progress.

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