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OFFICE OF SCIENTIFIC RESEARCH IN THE UNITED STATES

Abstract

Experience in the management of science in the United States is of considerable interest because it is about the world's largest high-performance and branched Scientific Technical Complex (NTC), which is closely integrated with the education, economic sectors and individual government agencies.

It includes research centers of universities, industrial corporations, national government laboratories, nonprofit research organizations, independent, small and medium-sized commercial and engineering firms, all kinds of co-operative organizations.

Key words: *Fundamental science, scientific researches, management of science, education, scientific and technical policy, scientific associations, research institutes, scientific laboratories.*

Аңдатпа

АҚШ-та ғылымды басқару тәжірибесі елеулі қызығушылық танытады, себебі бұл білім, экономика салалары мен жеке үкімет органдарымен тығыз байланыстағы әлемдегі ең ірі жоғары өнімді және тармақты ғылыми-техникалық кешен.

Ол зерттеу университеттердің орталықтарды, өнеркәсіптік корпорацияларды, ұлттық мемлекеттік зертханаларды, тәуелсіз түсімісіз зерттеу ұйымдарды, ұсақ және орташа коммерциялық және инженерлік фирмаларды, алуан түрлі кооперативтік ұйымдарды қамтиды.

Тірек сөздер: *Іргелі ғылым, ғылыми зерттеулер, ғылыммен басқару, білім, ғылыми-техникалық саясат, ғылыми қауымдастықтар, зерттеу институттар, ғылыми зертханалар.*

Аннотация

Опыт управления наукой в США представляет значительный интерес, поскольку это крупнейший в мире высокопроизводительный и разветвленный научно-технический комплекс, тесно интегрированный со сферой образования, отраслями экономики и отдельными правительственными органами.

Он включает: исследовательские центры университетов, промышленных корпораций, национальные государственные лаборатории, независимые бесприбыльные исследовательские организации, мелкие и средние коммерческие и инженерные фирмы, всевозможные кооперативные организации.

Ключевые слова: *Фундаментальная наука, научные исследования, управление наукой, образование, научно-техническая политика, научные ассоциации, исследовательские институты, научные лаборатории.*

It is well known that basic science is not profitable in the short term. However, the importance of and support at the national level, research is difficult to overestimate. Because of this, States are interested in promoting the development of science, which are complex mechanisms for the distribution of budget funds for scientific purposes, as well as the control and supervision over the implementation of the objectives. In this case, in close connection with scientific activity is stimulated by the development of education, including undergraduate and postgraduate, as the scientific and educational system is so integrated, that is very difficult to separate them.

Experience in the management of science in the United States is of considerable interest because it is about the world's largest high-performance and branched Scientific Technical Complex (NTC), which is closely integrated with the education, economic sectors and individual government agencies.

It includes research centers of universities, industrial corporations, national government laboratories, nonprofit research organizations, independent, small and medium-sized commercial and engineering firms, all kinds of co-operative organizations.

The main feature of the mechanism of formation and implementation of science and technology policy in the United States should be called the principle of competitive allocation of resources, stimulating the mechanisms of market competition on the willingness of potential customers to implement development, academic freedom and university autonomy in the selection of research activities, the latter a close relationship with the teaching and training, patent laws and policies that provide strong incentives for invention and innovation, flexible economic and legal mechanism capable of a wide variety of forms of organization of individual and cooperative activities in the field of R & D and development of their results.

The role of government is that it provides the mechanisms for the autonomous functioning of the STC, organizes activities for development of the national scientific and technical progress. Through their bodies, it guides the process of decision-making on priority directions of science and technology at the national level, through the state budget – mobilizes and distributes to the national science and technology resources, through a differentiated tax policy affects the allocation of funds for the private sector to improve NIOKR.V such a system Kazakhstan is useful to study the experience of the United States in the regulation of science and education.

The system of legal regulation of the monitoring and supervision in the sphere of education and science in the United States established three levels of regulations.

The U.S. Constitution (The Constitution of the United States of America) to the conduct of the U.S. Congress considers the power to «promote the development of science and crafts.»

The Committee on Science, Space and Technology of the U.S. Congress, founded in 1958, has jurisdiction over all non-military federal research and development. In particular, the Committee has partial or complete jurisdiction over the following federal agencies: NASA, the Department of Energy, Environmental Protection Agency, the National Science Foundation, the Federal Aviation Administration, the National Oceanic and Atmospheric Administration, the National Institute of Standards and Technology, Ministry of Emergency Situations, the Geological Survey United States.

The Committee is composed of five subcommittees – the Subcommittee on Energy and Environment Subcommittee on Investigations and Oversight Subcommittee on Research and Science Education, Subcommittee on Space and Aeronautics, and the Subcommittee on Technology and Innovation.

U.S. Federal law regulates the activities of government departments and other federal agencies to implement their research programs and placing orders for research and development.

Bylaws state agencies establish internal controls and oversight over the conduct of scientific research in the subordinate offices and organizations.

Research sector United States has an extensive system of executive bodies implementing administrative, advisory and control functions, including:

1. The National Research Council (National Research Council) and contributes to the dissemination of knowledge in the natural and social sciences, mathematics and engineering, and use this knowledge for the public welfare, and is involved in shaping public policy on science, technology and health care.

2. The National Research Council (National Science Board) was established to monitor and analyze the state of science and technology in the country, in addition, the board performs the functions of research funding through the distribution of grants and monitoring of their intended use.

The structure consists of NSC Adviser to the President for Science and Technology (NSC head and NSF) and the leading figures in science and technology (university presidents, vice-president of science and technology, leading scientists and engineers). Members of the NSC appointed by the president for a term of 6 years in such a way that changes every 2 years third HHC.

3. NSF (National Science Foundation, NFS) – an independent federal agency responsible for advisory and financial support for basic research in all fields of science and engineering, except for medicine.

The Law on the National Science Foundation (The National Science Foundation Act, 1950) defines functions such fund, asinitiation and support through grants and contracts scientific and technical research and programs to strengthen the scientific and technological potential of the country;

awarding scholarships in science and technology;

exchange of scientific information among the scientific community the U.S. and foreign countries;

assessment and identification of the needs of natural and engineering sciences with a view to their coordination with other federal and regional programs and policy departments using their own research;

Determining the universities and other organizations the amount of funding required to conduct their research, and to ensure that the conditions of their work.

It should be noted that NFS is the practice of an independent internal control implemented by the Office of the Inspector General (Office of Inspector General (OIG)). The activities of OIG seeks to improve the effectiveness of programs funded foundation, as well as the prevention and detection of fraud, misuse of funds and abuse of office. (1)

NFS primarily funds programs of basic research at universities, cooperative research companies and small businesses. NFS evaluates incoming requests and decides on the allocation of funds. Almost all of the funds from the budget NFS aims at financing programs.

Allocation decisions are taken on the basis of an independent assessment, carried out by scientists from all over the country. More than 50 thousand scientists and engineers engaged in this process every year. Expert opinions are concentrated and are discussed in the specialized committees of scientific and technical advisors, consisting of representatives of science and technology. Monitoring the effectiveness of spending is in the form of reports on the results of research. In addition, the NFS tracks publications prepared on the results of funded research, as well as the frequency of citations of these works in the future. In addition to the NFS is a special program of evaluation of cost-effectiveness, according to which each of the research programs every three years, subject to a mandatory check of the external experts in order to ascertain how well it is managed.

4. Office of Science and Technology (Office of science and technology policy (OSTP)) was established in 1976 as part of the Administration of the President of the United States.

Basic provisions on the activities of the registered in the same section of the Laws (2), according to which the strategic objectives of the OSTP are:

- granting the President of analytical information and expert advice on proposed government programs and policies in the field of science, as well as advice on important issues falling within the jurisdiction of the body;

- close cooperation with the relevant federal agencies, representatives of national and international scientific community, the private sector to identify existing needs of society and the state, problems and trends of the scientific world with the aim of coordinating and implementing effective technology transfer;

- study of the nature and requirements (including the amount of funding) national science and technology policy and make recommendations for its correction.

In 2010, the order of the U.S. President in the Office of Science and Technology was established President's Council on Science and Technology (President's Council of Advisors on Science and Technology (PCAST)), which includes representatives from recognized authorities in any field natural and technical sciences. In addition to consulting, said body performs the function of mediation, presenting at the request of the National Science and Technology Council (National Science and Technology Council (NSTC)) view of the private sector on issues of science. (3)

5. In the U.S., there are 3 types of scientific associations: Association for disciplinary principle, associations representing all of science, interdisciplinary association for the solution of major problems.

American Association for the Advancement of Science (AAAS) – an international non-profit organization that implements the functions in support of education and science and to promote inter-ethnic scientific cooperation.

Associations created by the disciplinary principle – the majority. Their main activity is to establish an information exchange between individuals interested in research on a single scientific discipline or direction. Such organizations have regional, state, or local units: associations, clubs, councils, offices. The implementation of direct business contacts and contracts are mainly for periodic meetings during the working group meetings. The main channel of communication are periodic scientific journals. Association of this type is – American Chemical Society (1876). The Company is conducting research and surveys on Advances in chemistry, organizes training courses for young scientists, provides research grants and awards, has a radio and television program, a library, publishes periodicals.

The primary role of scientific associations is to perform communicative functions within the scientific community, as well as between them and external stakeholders. They are negotiated, and are themselves involved in the national cooperation between different research institutions in the country and with foreign institutions. Organize seminars, symposia, scientific exhibitions, transmit scientific information through its publications; give out research grants, awarded prizes, conduct other activities to scientific training, etc.

There are a small number of large groups that in order to achieve common goals of science supporting cooperation of various organizations. Published their scientific journals cover a much broader range of issues than other associations, publications, and is widely popular in the business community. Editorial board shall consist of representatives of different scientific disciplines. A large part of the issue is devoted to news in science and technology, issues of state science and technology policy.

The Charter of the American Association for the Advancement of Science says that it is designed to stimulate the work of scientists and improve the effectiveness of science in order to improve

social welfare. Organizational Association is divided into committees and sections. First formed by the problem principle, the second – on a disciplinary. The richest potential AASRN are established contacts with many branch scientific and technical societies, scattered across the country, periodicals, free membership, high efficiency performance. Interdisciplinary associations can act on a permanent or temporary basis.

6. The bulk of basic research in the public sector through research, lab federal agencies. Due to the high concentration of material, technical and human resources, such national laboratories in the U.S. are called national research centers.

Laboratory of federal departments and agencies vary in size, type, research programs, the scope of activities. Legally, it's focused research organization with a permanent staff of researchers. Of these distinguished national laboratories whose activities are of national importance.

Government laboratories managed by the relevant ministries and agencies and are intended for their scientific and technical services: research, implementation of organizational and administrative functions at the conclusion of research contracts with outside artists, advice on the development of individual departmental plans, programs, and science policy in general.

7. Science in major U.S. corporations also has the feature. One of the main problems of management of scientific activity in the large industrial firms is the combination of cost-effective production with the active conduct of research and development. Preferred orientation on their own in terms of administrative and economic forms of organization across the corporation often leads to depletion of technological advance, sluggish stream of innovation processes. The overwhelming importance attaches to the quantitative indicators – the number of scientists and engineers in the units, the volume of scientific publications, etc. This is the basis for the emergence of a kind of a layer of «scientific bureaucracy,» interested in the bureaucratic institutionalization of R & D and deceptive nature of their statistics.

Resume. Basic research in the structure of the innovation process to the greatest extent have distinctive characteristics of innovation. This uncertainty is the ultimate goal and how to achieve it. The maximum possible «man-caused» nature of basic research, the lack of interchangeability of performers, their uniqueness. This is a special system of values and motives for action, scholars, etc. All of this leads to the fact that by the departments of basic research in corporations, even within the bureaucratic system of governance apply specific methods of control that are different from the methods peculiar mechanistic system.

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