

DEVELOPMENT OF RUSSIAN UNIVERSITIES INTERACTION IN THE TECHNOLOGY COMMERCIALIZATION PROCESS

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The article examines the current state of the intellectual work results commercialization development. It contains an overview of the problems hindering an effective transfer of technology and observes the logics of the active interuniversity cooperation in the area of innovation commercialization.

The development and effective use of intellectual work results is a critical factor for a sustainable development of the world economic system nowadays that provides the need for making domestic science the base factor in the development of Russia creating its intellectual, social and economic potential, guarantee of national security in terms of world economy globalisation.

Despite an obvious need to develop scientific and innovative sectors of economics, it must be recognized that funding these areas is not always a priority. Researches, which are not only scientifically and methodologically valuable, but of high economic efficiency as well are becoming more expensive at the time of their running, what can be explained by increasing complexity of tasks and the level of intellectual costs, which ultimately strengthens the mechanisms of selecting priority for public science funding.

All these factors lead to the changes of the research implementing mechanisms. A growing number of basic research are conducted together with foreign partners, which suggests the development of international cooperation for basic sciences but at the same time applied studies are becoming more secure and highly specialized that can sometimes give a rise to the problem of duplication of results while the monitoring system of scientific research is not developed enough.

Anyway the impact of market mechanisms could not refer Russian science, which, under the current deficit faces the challenge of preserving scientific, technical and intellectual potential. The current state of government measures can mitigate the effects of the crisis and save a substantial portion of accumulated scientific and technological capabilities, as well as

contribute to the persistence of forward positions on a number of priority areas for development of modern science and technology.

However the disproportionate needs of science and funding levels are currently being actively introduced which leads to implementing programs exacerbating domestic competition, for example research funding on a competitive basis through budgetary and extra-budgetary funds, the formation and implementation of targeted programs. Tightening control over science financing is designed to create necessary conditions for maintaining and developing the most promising parts and scientific training, identifying priority areas in science and technology and focus available resources on those areas, reformation of scientific and technical complex, creating a technological basis for transition the path of economic growth and improving population welfare.

Scientific, technical and economic components of innovation society are formed especially by high-tech corporations, scientific and educational organizations. Higher education institutions traditionally are a source of new scientific personnel and advanced research, and they represent a generator of scientific research and innovations, mostly affected by market influence on the scientific sector.

To identify the university, which facilitates the rapid development of society through an intensive and large-scale transfer of new knowledge generated inside of it, including the technology in various human activity areas (scientific, technical and socio-humanitarian), some economists introduced the term "Innovation University".

The purpose of the development of any higher educational institution is to strengthen its

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own position and leadership in the field of education and science. To achieve this management of many universities decided to introduce the strategic planning of universities activities providing a search for optimal solutions to the most important challenges with limited resources of university. The main purpose of many universities according to the state transition on the innovation path of economic development was the implementation of innovative models of universities development and mechanisms of its transformation into an innovative university complex.

The innovative model of university development requires a high degree of integration of science, education and innovation activities, creation and implementation of mechanisms to enhance real university competitiveness by improving the quality of all its activities. The main task of the innovative university is high quality preparation of the innovation-oriented professionals in major areas of technology on the basis of united process of dissemination and application of new knowledge, as well as active production and promotion of innovative development.

The main objectives of the innovative university may be the following: the preparation of highly skilled professionals capable, based on deep fundamental knowledge and specialized training, to make a significant contribution to the development of Russian science, education and culture; development of basic and applied science as the basis of quality education, creation of advanced technology and technology; system integration activities with the university's strategic partners, aimed at creating long-term scientific and educational cooperation, strengthen of the innovation activities and development of a common information space.

One of the main goals of development of the innovative university is to increase its competitiveness that can not be realized without providing qualified personnel training that meets the requirements of the current level of innovative development through the creation and commercialization of scientific, technical and educational products and services, management of intellectual property and development of innovation and intellectual potential of the university. Management of intellectual property should be a part of strategic management.

In the current conditions intellectual property should not be seen any more as an inevitable product obtained as a result of new research and development, now it is a serious argument in the competition. Determining the feasibility of making the intellectual resources in intellectual property and intangible assets, assessing their value, choosing effective forms of legal protection - all these are important components of intellectual property management at the innovative university.

The existence of knowledge transfer system, which includes the subsystem of technology transfer, is considered to be a major characteristics of the innovative university, because knowledge-oriented society not only requires a much more rapid use of science in practice, but also manufactures technologies accelerating the process.

These more visible needs have to be ensured and through the innovations in education sphere, which creates prerequisites for interaction between new high-tech corporations and universities. In general, knowledge transfer is a system of organizing multi-layered interface between the university and its external environment particularly with the high-tech companies.

The university is becoming the leading part and the organizational facilitator for the cooperation of educational and scientific institutions with the producers, cultural institutions, power structures. The goal of cooperation here is to join the efforts to solve the problems of interdisciplinary purposes of education and science as well as innovation implementation. As an integrator, the university provides its own internal capacity for institutional collaboration, but also generates external networks of information interaction.

Thus high school serves as a participant and as an intermediate as well, and sometimes as a catalyst for interaction.

The development of innovative universities is of fundamental importance for Russia, with its weakest interaction of basic science to the scope of applied research and development and implementation of their results into production.

Facing capital deficits at enterprises, as well as limited public support, essential for the revitalization of innovation activity is to attract finance from private sources for technology commercialization.

Domestic scientific and technological potential has great possibilities to develop the commercially valuable technologies and if favorable institutional and economic environment was created it could be a profitable area for investors. And innovation infrastructure development plays a very important part in this respect.

One of the major problems of modern economy is lack of effective communication between science and production, i.e. lack of effective mechanisms for commercialization - bringing scientific and technological ideas to the product, while the developed innovative infrastructure is the most effective model for interaction between science, education and manufacture, liaison between the developer and consumer of innovation.

The weakness of infrastructure is a major barrier to technology commercialization, and the formation of a national innovation system is defined as a major challenge and an integral part of economic policy. In the process of generation and infrastructure development it is crucial to solve tasks as creating an enabling legal and regulatory framework of innovation activity in the commercialization of research results and infrastructure support that will create conditions for effective public-private partnership aimed to create innovative sector of the economy in the interests of state, business and civil society.

One of the main goals of creating the infrastructure of innovation is the creation of business entities system capable of providing effective implementation of innovation in public interest, therefore the purposes of infrastructure development are overcoming production decline with reengineering and restructuring economy, increasing the competitiveness of domestic production and investment attractiveness of the national economy, preserving and developing scientific and technological capabilities.

The most effective way to introduce scientific research results is a network of small and medium-sized innovative companies which are able to develop competitive technology products quickly and at a minimal cost. The widespread development of innovative entrepreneurship in Russia will enable to engage a great scientific and technological potential in the process of market reforms and reanimation of the domestic economy.

Creation of regional science and technology parks, innovation and technology centers with their subsequent merger into a network, which provides innovation escorts throughout Russia must be included into the basis of innovation infrastructure development. Universities may and should play an important role in the revitalization of this activity.

The formation of the integrated scientific and educational systems has to become an important part of the implementation of the relationships between science and higher education, streamlining their structure, functioning and interaction.

It is necessary to fully exploit the potential of university science in order to strengthen its influence on the processes of transformation in the economic and social entities of the Russian Federation, which again underscores the importance of developing such areas as the innovative university, which ensures the influx of new personnel and creations in the Russian economy.

Nevertheless, the model of innovative high school, with its management structure based on planning and organizing the links between innovation entities and innovative-active and creative teams, the innovation infrastructure, collegial, deliberative council and system of training and research activities management in the light of market and external environment demand is suitable only for a large university, a scientific-technological and educational center of a major industrial region. In this case, almost all infrastructure support is able to provide services on a contractual basis and should maintain an independent self-supporting activity aimed at a profit.

However, the problem of technology transfer rationalization in smaller universities at the regional level, which limited resources do not allow active use of outsourcing and transfer of managerial and organizational functions outside to consulting companies in the deficit of internal specialists of the required profile, still remains unsolved.

Considering the system of universities technology commercialization in the regions it can be identified that despite the profile of high school and lack of experience in the transfer, every university has its own "technopark" or department of technology transfer for their own production.

In scientific literature there has been a lot of arguments how to use the potential of Russian science developers most effectively and gain a real market valuable product. It is needed to organize the management of intellectual property for research commercialization at the professional level inside institutes and universities. Nevertheless, the fact that an effective transfer of technology is impossible without involving skilled professionals who can assess not only the technological parameters of the product, but also market demand and commercial attractiveness of innovations to potential customers is preferred not to be mentioned. Technical and medical universities apply to outside specialists when the initiative implementation requires additional funding and asked as a minimum to provide a business plan to justify investor its vision and its prospects in the event of participation in the project. At the same time it seems more logical to carry out a pre-market monitoring in order to identify their needs and for the finished product - technology audit to assess the realities of marketing before launching mass production.

Abroad those tasks are usually run by technology transfer centers or technoparks, such a practice in Russia is only beginning to be implemented, that does not substantially support the use of innovative potential of Russian specialists and universities, especially in the regions.

Thus during the formation and development of technology transfer system, development of cooperation of Russian universities in the technologies commercialization is becoming actual. And it would be logical to consolidate the functions of providing consultancy for universities with economic profile, which by their nature generate knowledge, methodology and expertise with the vision of commercial viability. With it active integration will occur in both directions, because industry professionals involved in product developing have a maximum of information on technical and technological details, while economists are able to carry out the forecast of the project performance based on this information.

No matter which direction would develop cross-sectoral cooperation, within the framework of interuniversity partnerships or through TTC or technopark, the structure occupied by

the commercialization of intellectual property in Russian research institutes and universities should address the following major tasks:

Creating the conditions of the effective management of intellectual property and science and innovation potential of universities;

Coordinating the interaction with real economy sector and public authorities to support development of the innovation activity;

Establishing and improving a tool of commercialization of research and development;

Motivation and active involvement of scientific personnel, young scientists, students and practitioners in the development and implementation of innovative products, advisory services.

It would be logical to assume that integrating link in its activities will perform such activities as:

1. Collection, organization and analysis of information on universities department work to identify the most promising areas of innovation and maintain and publish information databases of universities.

One of the main tasks solved in the process of establishing a system of commercialization, is organization of the information flows associated with commercially promising projects, according to that the role of technology audit increase. During audit runs the estimation of commercial potential and competitiveness, and as the result normally there is a management decision on the appropriateness of the continuation or termination the project of its commercialization.

2. Legal assistance to participants of innovation relations, legal protection of intellectual property. This area combines the functions of information security and intellectual property management, as well as the functions of supporting the process of commercialization of research results in universities.

In preparing proposals on the feasibility of exclusive rights to register and choose the form of legal protection, taking into account the evaluation of commercial potential of project, the main criterion for the decision is to evaluate the benefits of legal protection. One of the first steps in implementing this direction is to assess the feasibility of maintaining or terminating support of existing patents, which represents an inventory of intellectual property. The

solution to this challenge should be based on the technological audit results for the scientific results, which were obtained with patents, and evaluation of commercial potential and possible strategies for commercialization.

Legal support of commercialization system includes issues related to the development of domestic regulatory documents governing the relationship in the commercialization of R & D results, as well as issues of maintenance projects for the commercialization of scientific and technological projects, including the preparation of legal agreements at all stages of signing contracts with partners and investors.

3. Creation of a commercialization of innovative projects strategy: identification of finance sources, marketing and business strategy. The preparation and conduct of activities involving universities in the sphere of innovative projects, regional, national and international exhibitions, conferences, meetings of the corresponding profile. Search for and negotiating with potential investors, purchasers of innovation. Providing guidance and advice on dealing with innovation and investment funds. The formation and support of a database of existing innovation and investment programs and funds. Development of universities cooperation in the innovation sphere with public authorities, other educational organizations and representatives of business, including joint activities (seminars, conferences, roundtables, etc.). Finding and analyzing information on the request of various economic activities related to science (innovation) activities of the university.

In addition, the integrating organization may pursue the consulting line, through the provision of advisory services in the field of innova-

tion management, economics, finance, management, law, information technology, etc. involving academics and other professionals, thereby developing the field of influence and involvement of new partners in its activities.

Another direction of development of universities innovative capacity and one of the most common form of technology commercialization could be the establishment and management of small innovative companies, which is more common for technoparks and business incubators, solving such problems as: searching for partners, investors (to attract funds, grants) for the establishment and development of innovative small enterprises, promotion of registration of small innovative enterprises; selection of managers for the management of small innovative enterprises, etc.

Anyway, the implementation of the principles of cooperation and labor division in the field of science and innovation in institutions of higher education seems particularly relevant at the present stage of technology commercialization development, allowing all participants of the innovation chain to concentrate on the effective discharge of their functions.

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