

## Modeling the Process of the Creation of Business Companies by Federally Funded Scientific and Educational Institutions

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**Abstract**—This paper considers the problems of the creation of business societies by federally funded scientific and educational institutions, the problems of introducing innovative developments at universities, the urgency of modeling the processes of commercializing the results of intellectual activity and the conduction of business games on this basis within the framework of practical lessons in the teaching process.

**Key words:** federally funded scientific and educational institutions, innovative developments, objects of intellectual property, commercialization, business societies; imitation modeling; business game; teaching process.

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Federal target programs solve the problems of financial support in order to develop the theoretical bases of priority scientific fields and conduct scientific-research and development activities in the system of state innovation management. However, there are problems in creating the results of intellectual scientific-technical activities and applying them in industry. As is noted in the materials of the College of the Accounts Chamber of the Russian Federation as of July 16, 2009 [1], the expenses of the federal budget for “civil science” for 2007–2008 came to 232.4 billion rubles. The cost of intangible assets belonging to the RF and taken into account in the register of federal property as of June 2009 amounted to 3.76 billion roubles, including intellectual property with a cost of 3.5 billion rubles. This being the case, the major reasons that such an insignificant volume of intellectual property belongs to the Russian Federation are the disadvantages that occur when organizing the turnover and defense of intellectual property created at the expense of the federal budget.

The adoption of Federal Law no. 217-FL On the Introduction of Changes into Separate Legislative Acts of the Russian Federation on the Problems of the Creation of Business Companies by Federally funded Scientific and Educational Institutions for the Purpose of Practically Applying (Introducing) the Results of Intellectual Activities (below, we will refer to this as the Federal Law) [2] as of August 2, 2009 implies the use of its norms in the institutions of higher education that are federally funded educational institutions, as well as in the federally funded scientific institutions created by state academies of sciences.

The Federal Law implies that federally funded scientific and educational institutions are independently given (i.e., without the agreement of an owner of their property but with the notification of the federal exec-

utive authority that fulfills the functions of development of the state policy and normative-legal regulation in the sphere of scientific and scientific-technical activities) the right to create business companies for the purpose of practically applying the results of intellectual activities (RIAs), whose exclusive rights belong to these scientific and educational institutions. These changes in the federal laws on science resulted in the establishment of the right of federally funded scientific and educational institutions and institutions of the state academies of sciences to create business societies by introducing the right to use RIAs as registered capital.

Usually, the legal and administrative collective of a university, as well as young scientists and students, do not have practical experience or the motivation to create a business company and do not imagine how a new enterprise must work and what prospects are opened. As for the organization of an enterprise, many problems bound with terminology, definitions in the innovative sphere, juridical and economic notions, patterns of the processes of commercializing RIAs, etc. occur. In practice, it is difficult to determine the expediency of creating a new organizational form attached to a university without special training. It is problematic to formulate a strategy to distinguish the complex of priorities, i.e., the sequence for carrying out activities in the course of creating and officially registering the juridical status of a new enterprise, and managing this enterprise for the purpose of achieving an efficient result. Under conditions where experience is lacking, it seems urgent to build models of innovative processes and to develop and carry out business games on their bases.

For the efficient solution of the complex of major practical problems that occur when institutions of higher education create business companies (federally

funded educational institutions are meant), it is necessary to order actions and to focus efforts on the following measures:

- formation of a list of the results of intellectual activities and the selection of the objects of intellectual property (inventions, useful models, industrial patterns, selection achievements, programs for electronic computers, databases, topologies of integrated circuits, etc.) that can bring about an economic effect;
- assignment of the rights of the results of intellectual activities (belonging to a scientific/educational institution), as well as the right for their use and introduction into the registered capital of a business company;
- estimating the expediency and making political decisions about creating a business company;
- searching for cofounders of a business company and attracting them;
- carrying out juridical activities for creating a business company (gathering founders; determining the organizational—legal form and name, the size of the registered capital and its shares, as well as the order of the rights to dispose shares and stocks; approving the regulations of a business company; appointing an executive agency; forming an executive agency and an observation council; and state registration of a company);
- carrying out economic and accounting actions (a cost estimate of the objects of intellectual property, a business plan, the formation of intangible assets, and federally funded accounting of the results of intellectual activities);
- developing a complex of organizational measures concerned with managing the activities of an enterprise;
- determining the optimal technical, technological, and marketing solutions; and
- providing the conditions for each participant of a business company to achieve practical use, introduce the results of intellectual activities, etc.

The Development of Active Teaching Methods project (Dynamic Models of Commercializing the Results of Intellectual Activities (RIAs) Using the Example of the Advancement of Biotechnologies) and their introduction into educational programs was presented for the purpose of supporting the solution of the designated problems by the Faculty of Public Management and the Biological Faculty of MSU. When the project was developed, different principles and approaches to management activities [3–6] and to the introduction of scientific and technical innovations were used [7–10]. The project involves applied studies on a spectrum of political, juridical, economic, managerial, psychological, and pedagogic processes concerned with developing and introducing scientific and technical innovations. The scientific novelty of research developments (RDs) consists in applying an

interdisciplinary approach, which unifies an intellectual product in the field of innovations (relating to the field of biology) with management technologies for introduction of the results of intellectual activities.

The project is aimed at building dynamic models of such innovative processes as commercialization and transfer of technologies, as well as their testing in a series of business games during practical exercises at a university. A game gives the idea of modeling the process of commercializing scientific and technical results and shows the necessary field of knowledge that is needed in order to achieve commercial success using innovations.

When a business game is conducted, skills in making decisions in the sphere of scientific—technical and innovative activities are acquired from the example of modeling the systems of objects and factors affecting the efficiency of commercializing scientific achievements. The game task is to search for an optimal model of commercialization and to gain the maximum profit from introducing an RD. The sense of the game is that the participants of the business game pass through the stages of transforming RDs into commercial products that have value terms and bring in income to an enterprise.

The game is intended for specialists in management in the scientific—technical and innovative sphere of activities: students, participants in courses who are raising the level of their skills, specialists working at scientific institutions of the RAS system and small and medium scientific—technical and industrial enterprises, as well as the administration and teachers of universities.

A series of business games is a visual demonstration of the models of the innovative process and an algorithm of consecutive decisions that occur when creating an enterprise for the purpose of applying innovations in industry. The simplified reflection of reality in a business game, group interaction, the evaluation of the results of scientific work and its adequate reward, changes in time scale, absence of responsibility, and other factors will permit students to quickly master new knowledge and to acquire skills in management decisions and personal experience in corporate communication. Conducting training sessions in the active form of business games gives students and young scientists the opportunity to become acquainted with the patterns, mechanisms, methods, principles, modes, and procedures of innovative activities in practice and to orientate themselves in the stages of the process of commercializing the results of scientific and technical activities and the specifics of managing objects of intellectual property. Business games assist students to overcome the fragmentation of separate scientific works and to receive a complete idea of a management system under conditions of dynamic development, thus obtaining an analysis of efficient decisions and estimating the success of a chosen tactics and strategy.

The series of business games under the common title *Dynamic Modeling of the Process of Commercializing RDs with Respect to Legal and Economic Problems at Universities Using Examples of Creating and Selecting Objects of Intellectual Property (OIP) in the Field of Biology and Introducing Them into Economic Circulation* consists of three games:

- “innovations in the field of biology. Modeling the creation of a business company attached to MSU (Business game 1);
- introducing objects of intellectual property (OIP) into economic circulation and creating intangible assets (IAs). Modeling the procedures for economic assessment of OIP (Business game 2);
- the exchange of intellectual property. Modeling tender processes and making commercial transactions (Business game 3).

#### *Business Game 1: Innovations in the Field of Biology*

The modeling of the creation of a business company attached to MSU involves the results of applied research, patents, potential RIAs, and selection achievements of the Botanical Gardens of MSU, as well as legal and economic opportunities, during the creation of a small enterprise (business company) attached to the Botanical Gardens of MSU according to Federal Law and the current legislation of the RF. These are presented in a practical lesson (seminar). Terminology, i.e., the notions, terms, and definitions used in the sphere of scientific and technical innovations, has particular importance in the game. In order to give the models a dynamic character, it is suggested that the juridical measures for official registration of a business company, order of disposal of the exclusive rights for RIAs that belong to federally funded institutions, as well as the development of the organizational, legal, and economic schemes of a business company according to the recommendations of the RF Ministry of Education and Science, be included in the game [3]. The algorithm for creating a business company attached to a university will be practically exemplified, and a sequence will be assigned for actions, such as forming the list of RIAs, selection of advanced inventions, useful models, selection achievements (and other objects of intellectual property), estimation of the economic expediency of creating a business company and making a political decision about its creation, and the organization of the procedures for the management of a new business company.

#### *Business Game 2: Introducing Objects of Intellectual Property (OIPs) into Economic Circulation and Creating Intangible Assets (IAs)*

Modeling the procedures for economic assessment of OIPs Modeling the procedures for economic assessment of OIP requires that the following issues are presented in a practical lesson (seminar): variants of the

cost estimation of patents, estimation of the right to use RIAs, which will be a contribution to the registered capital of a business company; attracting independent appraisers, consulting services, rights for the legal defense of OIPs with consideration for the specificity of selection achievements, accounting procedures for entering items in a company's books; and the properties of entering an OIP object in the books of a new business company as registered capital and as an intangible asset.

#### *Business Game 3: The Exchange of Intellectual Property*

Modeling tender processes and making commercial transactions requires that the following issues are demonstrated in a practical lesson (seminar): the procedures for state registration of the rights for an OIP, license agreements, agreements for concession of the rights in the sphere of intellectual property, conditions for making commercial transactions, and the set of necessary documents, as well as schemes for market research and searching for partners, etc.

According to the results of performance of the project, thorough analysis of the processes of managing innovative activities using the example of advancement of biotechnologies is planned, in order to develop the dynamic models of the process of commercializing the results of intellectual activities with respect to legal and economic processes at universities, as well as models of the processes of creating and managing a business company attached to a university. It is suggested that the experience generalized in the recommendations be replicated by including it in the standards and educational programs of other institutions of higher education.

Modeling of dynamic processes has become a common method in the development of the cosmic sciences, the sphere of defense, nuclear-power engineering, health protection, and other fields of teaching in the management of complex systems. Modeling the dynamic processes involved in introducing innovations gives specialists the opportunity to train (on a simulator), to gain personal experience, to demonstrate and evaluate weak and strong sides, to understand at what stages and at what expense time and resources can be reduced, and to determine the optimal paths of goal achievement as a result.

The performance of the project must result in the methodological basis for the systematic analysis of an integral model of interdisciplinary relations (economic, juridical, political, and psychological relations) during the process of innovation introduction and the commercialization of the most recent achievements of applied science in the field of biology. The educational program of the course *Introduction to Innovative Management*, which is taught at the Biological Faculty of MSU, will be supplemented and widened based on the theory that is created and the

developed models. Introducing a business game to the educational process will permit students to understand schemes for the introduction of innovations and put the results of intellectual activities into practice, to increase the quality of RDs, to target the results of RDs in the course of applied scientific research, and to get a complete idea of the entire process. The works on modeling the stages and procedures of commercializing the results of intellectual activities, transfer of technologies, creating and introducing the objects of intellectual property into economic circulation, creating business companies attached to universities will make a contribution to the methodical support of educational programs and activation of a system for the public management of innovations for the efficient realization of the scientific potential and the development of mechanisms for the integration of education and science.

The results of the game modeling will help students to gain knowledge and apply it:

- the patterns, basic schemes, and methods for management solutions of problems of an economic, juridical, political, or psychological character in the course of creating business companies according to the Federal Law;
- the practice of creating, transmitting, and applying innovative developments in industry; and
- the process of the formation and increase of the value of intangible assets belonging to federally funded scientific and educational institutions.

The performance of the Development of Active Teaching Methods (Dynamic Models of Commercializing the Results of Intellectual Activities Using the Example of Advancement of Biotechnologies) and Their Introduction into Educational Programs project and the introduction of new teaching methods are aimed at increasing the level of competence of specialists in the course of training students to achieve the highest professional skills in the field of innovative management and managerial sciences. The project is aimed at forming efficient scientific collectives of teachers, students, postgraduates, and doctors.

Despite the fact that this project did not win the Competition of Russian Science (for the right to conclude a public contract to perform RDs) that was held within the framework of the Scientific and Scientific–Pedagogic Personnel of Innovative Russia for 2009–2013 federal target program [11], the problem of creating business companies by scientific and educational institutions for the purpose of introducing the results of intellectual activities remains urgent and politically significant from the standpoint of realizing tasks of public management in the field of science and the practice of making decisions at different levels.

Applying the instrument of the theory of mathematical and imitation games during preparation of decisions made during the introduction of scientific–technical innovations makes a constructive contribu-

tion to the development of theoretical and methodical scientific approaches to the process of developing management decisions and the search for the optimal variants for problem solution.

The modeling of innovative processes and their management is an advanced field, which helps to solve the problems of introducing innovative developments, development of the transfer of technologies, increases the values of intangible assets at universities, and promotes the use of the newest scientific achievements. Moreover, this field shows considerable promise in the development of a system of higher education in the field of public administration in the sphere of management of science and innovations and the implementation of scientific–technical and innovative policy.

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