

# Strategic intellectual property management system for universities and scientific organizations for efficient technology transfer

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## ABSTRACT

The technology transfer development is a strategic priority in the economies of many countries. For a successful and efficient technology transfer, a high-quality exchange process between science and industry must be established. In this publication author review the specifics of Intellectual Property management systems in higher education institutions. Universities and scientific organizations should strive not only to create patents with public funds and publish in top-rated journals, but also work efficiently with industrial partners to increase the commercialization level of their developments. For that purpose, it is necessary to create a specialized structure in the university – a technology transfer center – that could manage Strategic Intellectual Property by using specific documents that form unique ecosystem.

## Keywords

Technology transfer, strategic intellectual property management, universities and scientific organizations.

## 1. INTRODUCTION

In modern world and Russian practice, the main developers of innovative technologies and suppliers of developments with the potential for commercialization are large universities, research centres and laboratories. Universities and research organizations are increasingly responding to the needs of the real sector of the economy for innovative developments by making changes to R&D plans. Developing towards a larger-scale participation of universities / research institutes in economic processes, offices and technology transfer centres contribute to building communications with other participants in research activities and subjects of the real sector of the economy, contribute to improving the quality of fundamental and applied research, and intensify the cooperation and integration interaction development. Based on fundamental scientific research, the results of the development of these institutions, having an applied focus, allow the companies acquiring them to form new strategic competitive advantages based on significant technological superiority [1]. Today, there is an aim on global and regional agenda to create the environment as well as the ways to make researches' results commercial, to make it possible having an income from the intellectual property. The universities should become the reliable providers of the specific intellectual products to meet the federal and industrial demand. In many strategies of scientific and technological development of countries, this aspect is qualitatively reflected – Russia [2], China [3], Germany [4], South Korea [5], USA [6]. It should also be considered the scientists' interest for publishing their

researches' results and being fairly treated. The question of making the balance between scientists, universities and federal parties is not only to appear within one organization. Universities and educational organizations are actively engaged in creating new products, but there is often no systematic work on commercialization - there are questions about attracting industrial partners, setting up accounting for the result of intellectual activity and the amount of royalties pay out.

## 2. STRATEGIC INTELLECTUAL PROPERTY MANAGEMENT SYSTEM

These problems of technology transfer can be solved by Strategic Intellectual Property Management System (SIPMS), which helps to build the commercialization stage step by step. Speaking about the strategic priorities of such a system it should be working for the researches, university administration and industrial partners to make the mutually beneficial cooperation. This approach guarantees all the parties' interests to be considered and minimizes the risks to lose one's intellectual property. It can also help to build the researches' reputation, attract new employees, and, finally, meet the federal demand for using the knowledge for the national economy benefit.

There is a vital experience of such a system in Russia: National Association of Technology Transfer has a Project Group that organizes an intellectual property management system in higher education institutions [7]. The activities of this group are related both to the holding of events to popularize and involve in the work of the vice-rectors of universities responsible for innovations, as well as a wide range of experts in the field of technology transfer and all interested market participants, and to the implementation of a package of standard documents for the IP management in universities and research centres.

In preparing a set of National Association of Technology Transfer model documents, the Intellectual Property Policy for Universities and Research Organizations, adapted by WIPO and the Ministry of Education and Science of Russia, was used. Pilot implementation of the IP management system to the Lomonosov Moscow State University experience showed that IP management rules in the local regulations should be first consolidated. These regulations can be the Strategy and/or the Policy in the field of IP management. MSU version of such a document is the Provision on IP management, which latest revision was approved in 2018 [8].

Speaking of key strategic principles of the efficient functioning of the strategic system, implemented to the Lomonosov Moscow State University, legal certainty, fair income distribution, and stability could be mentioned. These principles are consolidated in the local regulations. The legal certainty

principle implies the right holder to have all the results of intellectual activity certificated, all the rights transactions to be confirmed by entering into a contract and fulfilling its conditions.

According to the fair income distribution principle, the university pays costs to get and renew the patent, including the international ones. The income of the commercial using the intellectual property is shared as following: The authors receive 25%, the faculty – 40%, the university – 35% of the reward. The amount of payments to the authors can be extended by the head of faculty, using the funds which the faculty got in the specified order [8].

An important aspect of successful technology transfer on the part of the authors is associated with the motivational part. [1] For example, Higher School of Economics — National Research University pays 30% of net contractual income [9], Saint Petersburg State University pays 50% of net contractual income for using intellectual property [10], Ural Federal University [11] named after the First President of Russia B. N. Yeltsin pays up to 50% of the royalty income.

The stability principle means that authors should remain confidential and report the university about the intellectual activity result before there will be any information published. The university recourse usage makes intellectual activity result as the university's property. Commission on university IP approves the key deal's conditions, as well as the patenting geography. Earlier, the IP management process in MSU was decentralized and implied several departments' parallel participation. Faculties were responsible for many matters in the field of IP management (including special legal, patent, accounting matters). However, not all the faculties could afford employees from the field needed. That is why there came an idea to reconstruct the IP management system. Moreover, it was necessary to do the rights inventory, analyse the demand for current intellectual activity result and prospective for the ones at the application stage [8].

The new IP management system is working in MSU since 2014 when the decision was taken on the pilot system implementation. Russian Federal Service for Intellectual Property (Rospatent) expertly supported the pilot implementation. The system is constantly developing, considering changing legislation, application practice, and special ministries and departments' recommendations. For example, the Ministry of Economic Development of Russian Federation developed in 2014 [12] and finalized the Recommendations on results of intellectual activity (RIA) management [13]. In 2018, WIPO and the Ministry of Science and Higher Education approved the Policy in the field of intellectual property for universities and research centres [14].

The main chain of a system implemented in MSU is Centre of Technology Transfer. The main goals of technology transfer centres are to promote the development of cooperation chains between science and business, attract investment for the innovative projects implementation and the creation of consortia, commercialize the results of scientific and technical activities, meet transfer innovative developments to industry and the market [16]. Centre of Technology Transfer of Lomonosov Moscow State University is a "one-step" facility for both internal university work and processing external suggestions and external demand. It is staffed with employees in the field of intellectual property management (patenting, licensing, business development and legal issues) with various competencies that allow assistance in the promotion,

development and practical application of the Moscow University developments in industry.

Strategic IP management system implementation helped MSU get significant results in two important rankings:

- National University Ranking (Innovations unit). There were 849 scores (8th place) in 2017, 805 scores (5th place) in 2018, and 774 scores (4th place) in 2019 [15].

- Invention Activity University Ranking (scores are summed). There were 57,9 scores (1st place) in 2017, 58,9 scores (1st place) in 2018, and 63,6 scores (1st place) in 2019 [17].

There are about 900 items in the overall MSU IP portfolio. There are also more than 30 valid license contracts made by MSU. At the same time, the income from RIA rights disposal multiply.increased. As a result of successful SIPMS implementation, the following information can be given:

11 licenses were issued with fixed payments for the current period and royalties for future periods;

legal support of transactions with industrial partners were undertaken;

119 notifications on disclosure of intellectual activity results were processed;

42 applications for inventions/utility models were submitted to Rospatent, 2 of them for international protection;

2 applications for industrial designs were submitted;

3 applications for University trademarks were submitted;

30 computer programs and databases submitted for registration;

received 55 patents for inventions/utility models;

received 37 certificates for computer programs and databases;

received 2 trademark certificates;

received 2 patents for breeding achievements [18].

There are also IP commission and Intangible Assets commission in the IP management architecture. The main chain of the system, NATT, is participating at all the stages of life cycle. At the first stage of the research, the Association approves the work conditions, announces the RIA creation, forms a document on its legal protection, and participates in making a request and applying for a patent. As all the actions mentioned above are made by one department, the amount of patent applications has raised up to 100 a year. That is 80% more that it was in 2014. After the grant of the patent, there is still commercial work to do. Be that we mean making additional research, communicating with appraisers, internal and external experts. As well as looking for partners, approving terms of the deals on RIA rights disposal, and controlling over university and developers treatment [8].

In conclusion, it can be noted that MSU has successfully implemented SIPMS, as evidenced by the results. It should be noted that such a system is effective for establishing systemic interaction between main participants in technology transfer, helps to set up a system work on commercialization and consolidate innovative offers for industrial partners. The presence of such system in technology transfer centres helps to work systematically even in the face of external challenges. The main SIPMS value is to reduce uncertainty, regulate liability and establish a standard business process. The presence of the same template for the industrial partner technological request makes it possible to create an innovative development catalog more effectively. Taking into account the professional

competence of each university and its structural organization, SIPMS is easy to adapt and change. NATT specialists are currently implementing SIPMS at Sechenov University and D.Mendeleev University of Chemical Technology of Russia [8]. Using this experience, we can talk in the future about the possibility of scaling it in order to form the maturity of universities to introduce their developments into national and global industry.

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