Digital platform for communication in the field of grant support of scientific, technical and innovation activities

To cite this article: Irina Ilina et al 2019 IOP Conf. Ser.: Mater. Sci. Eng. 497 012074

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Digital platform for communication in the field of grant support of scientific, technical and innovation activities

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Abstract. The information platforms, which let make decisions in the scientific sphere, play an important role in the development of digital economy of a state. In Russia a range of such platforms are in place, which have been created under governmental support and they let make record of and monitor the intellectual property (https://rosrid.ru/, http://sciencemon.ru/ and other). The scientific foundations have information platforms. However, fragmentation of grant informational sources contributes to the increased transactional costs. A digital platform was created in Russia to make information about grants available. It also lets state, scientific foundations, and potential applicants communicate with each other. This site-navigator provides access to actual aggregated information of different scientific foundations. It also lets find the best foundation for a potential applicant’s needs. We suggest that the site-navigator needs some new functions, which would let a user detect leading countries in the support of R&D in the defined technological areas and most attractive foreign jurisdictions having strong commercial potential in a given technological area. Hence, suggested transformation of this digital platform will help target researchers get competitive results, using inter alia foreign support, and patenting in the countries with fast-growing knowledge-intensive markets.

1. Introduction

The digital platforms oriented to the rise of effectiveness of communications in R&D appear to be a very important instrument of digital economy development in terms of global competitiveness of the knowledge economies. These platforms play an important role in the creation of scientific and technical potential and maintenance of competitive sustainability of a state on the international markets. Nowadays there exist digital platforms in the scientific sphere in Russia, which let monitor the results of completed R&D under the governmental support, such as:

- United federal system of civil R&D registration (rosrid) [1];
- Federal system for monitoring the results of scientific R&D organizations (sciencemon) [2];
- Information systems of the scientific foundations, such as: Russian foundation for basic research [3], Foundation for promotion of innovations [4], Russian scientific foundation [5], and other foundations of scientific, technical and innovation activities support;
- Information systems of Federal target programs (FTP) of the Russian Federation [6];
- System “Digital budget” [7];
- Information system for articulation of the state task for higher education institutions and scientific organizations [8];
Information system for administration of Research & Development and state task of the Federal Agency of Scientific Organization of the Russian Federation (FASO) (in May 2018, the President of the Russian Federation signed a decree on the structure of federal executive bodies, in accordance with which FASO was abolished) [9, 10] and other information systems in the sphere of science.

It is necessary to mention, that there are no systems in Russia providing the researchers with information on the instruments of R&D support. In this article we discuss a digital platform, which provides the applicants with an access to information about instruments of R&D support of the foundations.

2. Methods

We used methods of system analysis, statistic and econometric analysis, and mathematic modelling in this research. The complex and system approach, analysis and synthesis, comparative method, aggregation and classification are all-scientific methods used in this article.

We made analysis of foreign jurisdictions in this article from the point of view of the research support for national researchers in the frameworks of technological fields and potential demand for developments, got through researches on the high technologies market.

3. Results

A digital platform is an “undermining innovation”, which represents an integrated information system and provides interaction of different users on the exchange of information and values. This leads to downgrade the total transactional costs, optimization of business processes, and makes the deliverance chains of information and services more efficient.

A register of scientific, technical and innovation activities supporting foundations (http://funds.riep.ru) was created and made freely accessible through the Internet to gather information about scientific Russian governmental and non-governmental foundations activities, and to provide the potential applicants with an access to aggregated data of governmental and non-governmental foundations and their consents[11].

Thus, Jacob B. A., Lefgren L. argue that grants influence the publication activity and citations of the R&D results. They conclude this proceeding from the analysis of NIH activities [12]. N. Prost [et al.] make similar conclusions [13]. The government in South Korea supports such R&D foundations as the Industrial Technology Development Fund (ITDF), the Application Technology Development Fund (ATDF), and the Science and Technology Promotion Fund (STPF). Jin Young Choi, Jong Ha Lee, So Young Sohn substantiate appearance of the long-term positive externalities thanks to governmental support of R&D through the foundations mentioned above [14]. These results confirm the need of creation and development a digital platform, which provides an operative access to the supporting instruments of projects at different stages of innovation cycle.

The register gives access to the information, organized in the form of the relational database. The information to the database is received from the foundations and open sources. The resource has a navigator (a system of filters), which lets choose an optimal scientific foundation which matches the interests of potential applicants. The system of filters lets choose a scientific field, a theme of a competition, a territory, a stage of the project’s life cycle, and a type of support. The web site has directions for users on the search of a desired type of R&D support (figure 1).

1 State task of the Ministry of Science and Higher Education of the Russian Federation “Creation and support of the register of foundations, which support scientific, technical and innovation activities, monitoring of their work and appraisal of their results and efficiency” 2.542.2016/HM
In general, about 4,000 visitors look for the information on the site-navigator more than 10,000 times with the average amount of visits exceeding 4,000 per year. The amount of searches is three times as high as the amount of visitors, which witnesses that the visitors are interested in the information of the web site.

In order to supply potential applicants with information about foreign grant support focusing on jurisdictions, which have commercial potential, it is planned to add data to the site-navigator on the foreign R&D foundations, which instruments are available for Russian researchers. There are also plans to input information of Technological Atlas.

Many foreign foundations provide support to the researchers and scientific organizations. The main goals of these foundations consist in enhancing academic mobility, obtaining important scientific results, and attracting talented researchers to solving scientific problems on the front edge of science [15, 16]. The introduction of data about 90 foreign foundations into the site-navigator will let Russian scientists and scientific organizations get timely information about activities of these foundations. This will enhance widening of international scientific contacts, starting new international scientific projects in Russia, and revitalization of the inclusion of Russian researchers into international scientific cooperation.

In order to attract grantees and other interested parties to patent the results of their R&D in foreign jurisdictions in certain technological areas, it is proposed to build a Technological Atlas into the site-navigator. This will allow identifying the leading countries in certain technological spheres using a Relative Strength Index (find further in this text).

The use of this tool will help researchers identify the best patent office to file patents and claim correct market segments. In turn, it will help Russia achieve the leading positions by the number of filed patents, since Russia currently is the 10th in the world by this indicator in 2016 (figure 2).
The Relative Strength Index (RSI) demonstrates the concentration of resources of a particular country in the specific field of scientific and technological development relative to focus of other countries in this sphere. RSI calculated by the origin of an applicant characterizes the directions of scientific and technical policy of a specific country. RSI calculated by the patent office reflects the relevance of national and foreign technologies in high-tech markets of a specific country.

As an example, the screenshot of the page of the Technological Atlas shows rankings by the number of granted patents and by RSI in the field of “Microstructural Technologies and Nanotechnologies” (figure 3). These rankings are calculated based on the number of patents registered by the residents of a particular country and the number of patents registered in the office of a particular country.

Technological field Microstructural Technologies and Nanotechnologies:
- Origin of applicant: Russia takes the 6th place by the number of granted patents, and the second one by RSI. The Russian researchers have been increasing the growth rate of patenting in this direction during the analysed period comparative to other technological fields relative to other countries. First, a number of measures of governmental support facilitates this in the field of nanotechnology, including the activities of SC RUSNANO.
- Patent office of a country: Russia takes the 7th place by the number of granted patents, and the fifth one by RSI. It shows that the Russian market of microstructural technologies and nanotechnologies is being developed due to Russian R&D (number of granted patents to applicants from Russia is almost equal to the number of granted patents from the Russian patent office).
Figure 3. Technological field “Microstructural Technologies and Nanotechnologies” [17].

The technological field “Medicine Technologies” is presented in figure 4.

In general, the current instruments of scientific and technical policy do not effectively promote the development and patenting in the field of medicine in Russia (the number of granted patents by the applicants is 18 times less than in the United States, 8 times less than in Japan, 4.5 times less than in China). The Russian high-tech market is developing in the field of medicine and it is attractive for foreign counterparts (the share of patents registered in the Russian patent office from foreign researchers is 50% of the total number of registered patents for inventions). Thus, the national high-tech market is not filled with Russian R&D.
Figure 4. Technological field “Medicine Technologies” [17].

The technological field “Digital Communication” is presented in figure 5. Russia lags far behind the world leaders in this field, not only in the number of patented inventions, but also in the speed of patenting by Russian researchers. The market share in the field of Digital Communications in Russia is represented almost totally by foreign R&D. This share equals 78%. 

The leaders in these fields are the most high-tech developed countries: USA, China, Japan, Republic of Korea, and Germany. They hold leadership thanks to the support of strong incentives for domestic researchers and this, among other things, leads to high capacity of their high-tech markets. Analysis of the scientific, technical and innovation policies of these countries makes it possible to identify tools of stimulating creation and patenting technologies in the studied fields.

The digital platform of the site-navigator after implementing the Technological Atlas with its 34 technological fields will allow identifying the most attractive jurisdictions for patenting. Placing the register of foreign scientific foundations to the site-navigator will simplify and expand the access of Russian researchers to grant support tools.

4. Conclusion
The register of scientific foundations was established with the aim of stimulating interest and increasing the number of applications for support to scientific foundations and providing grant recipients with access to operational information on the activities of the foundations. This tool gives access to timely information on the directions, forms of support, the size of grants, contact data of foundations. This information allows selecting the foundation that is optimal for the applicant's request. The register of scientific foundations contains data on the activities of a foundation, the subject of competitions, the types and forms of support suggested, the terms and conditions of support provision, and contact information. A feature of this site-navigator is that information about foundations is organized according to the life cycle of the scientific project, which allows a potential applicant to determine the necessary forms and types of support that he or she can get from the scientific foundations at the specific stage of research and development.
The necessity for the development of the Register of Foundations is determined by two circumstances:

1) this digital platform is a step in the implementation of state policy in the field of science. The development of the system of scientific foundations (both state and non-state) as we see it today started after the meeting of the President’s Council of the Russian Federation for Science and Education on November 16, 2012 (http://kremlin.ru/events/president/news/16840). The register of foundations, which supports scientific activity, is one of the tools to organize effective partnership of the state, intellectuals and business.

2) development and improvement of the quality of work of the foundations is closely related to the demand for their services and effective interaction with their applicants and grant recipient. The availability and openness of foundations’ data, as well as their systematization on an official resource, will provide potential grant recipients with access to up-to-date information on the forms and types of support, foundations contact information, information on its activities, etc. In addition, the effective interaction of foundations with grant recipients will become an incentive for the emergence of new forms and types of support, which are in demand in the relevant period of time.

This platform will allow synchronizing demand from scientific groups and the offer of scientific foundations. As a result, the problems of access to scientific foundations’ web-sites will be solved, transaction costs associated with loosing time on finding sources of financing research and development will be reduced, and the speed of scientific research will be increased.

Thus, the Register of Foundations for the Support of Scientific, Technical and Innovation Activities, created and placed in the public domain on the Internet is a digital communication platform between the state, foundations and grantees, and is a tool for promoting activities of foundations, thereby contributing to the development of the system of scientific foundations in Russia.

Acknowledgments

The research was carried out within the framework of the state task of the Ministry of Science and Higher Education of the Russian Federation “Analytical and methodological support of measures for monitoring and analyzing the activities of the foundations supporting scientific, technical and innovation activities” (project No. 29.12272.2018/12.1).

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