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UNIFIED SYSTEM OF SCIENTIFIC INFORMATION AS A STIMULUS FOR INTEGRATION AND DEVELOPMENT OF SCIENCE

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The subject of research is information systems that allow you to integrate scientific knowledge, including in the field of law enforcement.

The purpose of the article is to confirm or disprove hypothesis about the possibility of creating a unified system of scientific information as well as to determine the elements of such a system.

The methodology of the study is a formal legal analysis of the normative legal acts and practice of functioning of scientific information systems.

The main results and scope of their application. Science has accumulated a huge amount of information that needs to be systematized. The research infrastructure does not allow you to quickly find the necessary information. The consequence of this is the problem of multiple independent scientific discoveries, plagiarism. There is also no standard for scientific research, which is why works written using the scholastic method are often found mainly in the humanitarian sphere. There are various search platforms that combine databases of publications in scientific journals and patents. These platforms simplify the search for information, but very poorly systematize it. These systems are also aimed at ranking publications, journals, and researchers. There are electronic encyclopedias that systematize knowledge. However, these projects also have serious drawbacks, mainly related to their focus on the non-scientists: 1. Insufficient expert level in the presentation and evaluation of the material. 2. There is no status of a scientific publication, which makes it impossible to publish scientific works using this platform. 3. There is no task to integrate scientific knowledge.

Conclusions. It is proposed to create a unified system of scientific information that will facilitate the search for the necessary data, make it possible to quickly get acquainted with advanced scientific developments, and increase the level of research, including through the introduction of the appropriate standard. This system can integrate the functions of an electronic scientific journal, an electronic library, an electronic textbook, as well as a search platform that provides the implementation of scientometric functions. The proposed system will be regularly and promptly updated as new scientific papers become available. Information in the system will be evaluated by experts for its ranking and use, including for related research. The system is primarily a source of publishing scientific information. The system will allow an objective approach to the selection of applications for financial support for research, including grants, ensuring transparency of this procedure.

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1. The problem of unsystematic scientific knowledge

There is currently a huge amount of information accumulated in science, the weak side of which is the low level of systematization. Sources containing scientific knowledge are mainly monographs, articles in journals, and abstracts from conferences. These studies are scattered, which makes it extremely difficult to find the necessary information. Educational materials are characterized by a simplified, abbreviated form of presentation of the material, a serious lag behind the advanced scientific developments. In addition, often in the educational literature there are attempts to pass off the author's opinion as a generally accepted point of view, which seriously disorients the reader. The quality of certain educational publications causes serious complaints. "Modern international scientific databases are filled with repeatedly duplicated pseudoscientific information, the exact volume of which is probably even difficult to measure" [1, p. 15].

If you want to find out what is established in science about a particular phenomenon, you need to process dozens, and possibly hundreds of different sources. A huge amount of time and effort is spent on this activity. A simple analysis of the list of published works in any scientific specialty allows us to say that no researcher is able to cover all published scientific works, much less study them in depth. At the same time, almost every day new works are published that also need to be studied.

For example, according to information obtained on the website elibrary, this electronic library received data on 144524 works on the topic "State and law. Legal Sciences", published in 2019. From 2012 to the present, ads for the defense of 5414 dissertations in the field of legal Sciences have been placed on the website of the higher education Commission of the Russian Federation. Human life is not enough to try to analyze most of these works. If we take into account the huge amount of research carried out by foreign authors, the need for systematization of scientific information becomes even more obvious.

Do not forget about the huge layer of research on related topics, performed within the framework of other scientific specialties. Hence, it is quite reasonable to note that there is a danger of drowning in a lot of private research, without reaching some General conclusions that could give an idea of the results of work in related fields [2, p.15].

As a result, scientists often "reinvent the wheel", duplicating already conducted research [3, p. 1]. There is a problem of multiple independent discoveries (for example, in the field of non-Euclidean geometry, wave theory of light, economic theory of value, correlation theory) [4, p. 27-33]. R. Merton in this regard wrote: "Without knowing previous works, scientists of other generations make discoveries that turn out to be rediscovery (that is, concepts and information already stated earlier in each functionally significant respect)" [4, p.28]. In particular, the negative effect of unsystematic scientific knowledge is manifested in the humanitarian sphere. As D. Price noted, "the cumulative structure of the natural Sciences has a texture with a sequential combination of elements, like knitting, while the texture of the humanitarian field is more like a random weave, in which any point is equally likely to be associated with any other" [4, p. 51]. In other words, "personal acquaintance with the works of the classics plays a small role in the physical and biological Sciences and a very large role in the work of humanitarians" [4, p.51].

However, even after finding the necessary information, the researcher is not guaranteed from an error when using it due to the lack of confirmation of the relevant data, erroneous methodological grounds. The debatable nature of research results is even more confusing in the process of using them. Working with disparate and numerous sources is also complicated by the fact that not all of them are worthy of attention at all. In the humanitarian sphere, there are often works based on the scholastic method. G. Spiegel describes this method: "... a question was asked, a possible answer to this question was discussed in detail, and after the reader was almost convinced, another

answer was discussed, and again in detail – and all this with copious citations of the authors. The last answer was the one chosen by the author" [5, p. 769]. Such information, of course, is not scientific information, since it includes "logical information obtained in the process of cognition, which adequately reflects the phenomena and laws of nature, society and thinking and is used in social and historical practice" [6, p.99]. One of the most effective criteria for the demarcation of scientific knowledge is the falsifiability criterion proposed by K. Popper, which means that scientific knowledge can be refuted in principle (the scientific system must allow refutation by experience) [7, p. 63]. That is, a certain statement can have a scientific character, if it can be refuted, to prove the opposite. Attempts to apply the criterion of falsifiability to works in the field of Humanities show that the information received is often evaluative in nature and is not subject to both verification (verification) and refutation (falsification). This quality affects, in particular, numerous concepts and their definitions, various classifications and typologies. However, serious human resources are also spent on writing and studying these works.

The development of scientific knowledge follows the path of formulating a certain paradigm. This concept was defined by T. Kuhn as "scientific achievements recognized by all, which for a certain time give the scientific community a model for setting problems and their solutions" [8, p. 11]. For this reason, there is a need to organize the knowledge obtained in accordance with the modern paradigm. As a result, the majority of scientists in the course of scientific activity are engaged in elementary ordering [8, p. 45].

To this we need to add the problem of serious disunity of the scientific community, including due to the language barrier, while communication and exchange of scientific information directly affect the productivity of scientific work [9, p. 40], and scientific information is a form of social information, especially in the field of social sciences [10, p.12]. Publications in a foreign language in our country are not required due to the lack of access to them by the researcher, and ignorance of the relevant language. For this reason, advanced foreign developments are often not taken into account by domestic authors.

One should also take into account the problem of plagiarism in scientific research, when the original work undergoes transformations, as a result of which, at best, previously obtained results are reproduced, and often distorted data is presented.

It is surprising that the regulatory regulation of relations in the field of scientific activity, carried out on the basis of Federal law No. 127-FZ of 23.08.1996 "On science and state scientific and technical policy", does not affect the issue of ordering, systematization of knowledge, let alone the integration of various fields of science. At the same time, in paragraph 2 of article 9 of this Federal law provides for provisions according to which the Government of the Russian Federation provides for the creation of Federal information funds and systems in the field of science and technology that collect, state registration, analytical processing, storage and communication of scientific and technical information to consumers. Decree of the Government of the Russian Federation of 24.07.1997 No. 950 approved the Regulation on the state system of scientific and technical information. This system is defined as a set of scientific and technical libraries and organizations-legal entities, regardless of their form of ownership and departmental affiliation, specializing in the collection and processing of scientific and technical information and interacting with each other, taking into account the system obligations assumed. In fact, we are talking about a library complex that helps only in the search for scientific publications. The knowledge contained in them is not subjected to analytical processing and ordering, systematization.

2. Modern information systems that facilitate the ordering of scientific knowledge

In previous historical epochs, scientific knowledge was systematized mainly by means of individual monographs, which set out the state of Affairs in a particular field from the perspective of a particular author. The appearance of printing in the XVI century allowed to significantly increase the

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effectiveness of the dialogue between scientists, exchange of information, including through periodicals (magazines) [11, p.68-69]. The same task was essentially solved by all sorts of encyclopedias, which still retain their popularity (the Great Russian encyclopedia, encyclopedia Britannica, etc.). In the absence of any systematization of scientific knowledge, various bibliographies have been published periodically [12]. At the end of the XX century. the advent of computers [13], and then the global information network (Internet) created conditions for the emergence of completely new forms of scientific knowledge exchange. Currently, there are various search platforms that combine databases of publications in scientific journals and patents (for example, Web of Science, Scopus, RSCI). However, these platforms simplify the search for information, but they do not systematize it very well. Moreover, these systems are rather focused on a certain ranking of publications, journals, and researchers. Having found the necessary information in the article, we do not know how reliable it is, or whether there are other more advanced studies on this problem. Legal scientific literature is also presented in reference legal systems. At the same time, these systems are focused on the problems of law enforcement, which is why they are seriously limited in their ability to organize the available scientific material.

There are electronic encyclopedias (for example, Wikipedia) that systematize knowledge. However, these projects also have serious disadvantages, mainly related to their focus on the mass reader. First, there is a lack of expert level in the presentation and evaluation of the material. Secondly, the lack of the status of a scientific publication, which does not allow you to "link" your publications through this platform, post information. Often, such encyclopedias contain only links to external resources, which periodically lose their relevance and change their location. Third, the lack of a task to integrate scientific knowledge, which is presented separately, non-systemically, which reduces the synergistic effect. Similar shortcomings, seem to be characteristic for classifiers of information resources in science (proposals for which are heard in the literature [14]) and for national scientific and educational interactive encyclopedic portal, initiated by the decree of the RF Government from 25.08.2016 No. 1791-R, created on the basis of the electronic version of the Great Russian encyclopedia and other Russian scientific encyclopedias. Most likely, this portal will serve as an electronic encyclopedia with an emphasis on familiarizing a wide range of readers with scientific information.

Thus, it can be stated that the infrastructure of scientific research does not allow you to quickly find the necessary information. The scientific community is already trying to solve the above problem. For example, there is a reference and information system MathTree, which helps you navigate the vast space of information resources in mathematics . For all its undoubted advantages, this system is primarily a search engine in relation to various external mathematical Internet resources, the information system itself is not intended for storing and processing relevant data. There are proposals for the preparation of scientific reviews in which the main provisions of theories and research results are presented in a form accessible to non-specialists in this field [2, p.15]. However, in the near future, the reviews themselves will need such systematization. In addition, these reviews could not provide a full understanding of the research. In systems of scientific information developed by enthusiasts, the emphasis is often placed on local functions of such systems, for example, informing about competitions of scientific grants [15, p. 26]

3. Improving the receipt and processing of scientific information in the framework of the national project “Science”

In Russia, since 2018, the national project "Science" is being implemented, calculated until 2024. the Total amount of funding should be about 636 billion rubles . This project is designed to ensure the presence of the Russian Federation among the five leading countries in the world that carry out research and development in areas defined by the priorities of scientific and technological development, the attractiveness of work in the Russian Federation for Russian and foreign leading

scientists and young promising researchers, a faster increase in domestic spending on research and development from all sources compared to the growth of the country's gross domestic product. At the same time, the goal is to integrate universities and research organizations and their cooperation with organizations operating in the real sector of the economy.

The national project "Science" takes into account the need to improve information systems, in particular, it is envisaged that:

1) a single digital platform for scientific and scientific-technical interaction, organization and conduct of joint research in remote access, including with the participation of foreign scientists (Federal project "Development of scientific and scientific-production cooperation"). This platform is a set of tools and services based on digital technologies that: provide integration with external identification systems (including foreign) of participants in scientific and technical interaction, ensure effective scientific and technical interaction of participants in research projects; support the work of participants in remote access mode, including with foreign partners; create conditions for virtual teams and virtual collaboration in the implementation of complex scientific and technical projects of the full innovation cycle; provide regulated access to the platform for foreign scientists to organize and conduct joint research, as well as international expertise; support effective exchange of scientific and technical and scientometric information between project participants; contain built-in tools for monitoring project implementation and automated reporting;

2) a digital system for managing shared scientific infrastructure services that provides barrier-free access for researchers to order services using the infrastructure, including digitized collections and data banks of organizations that perform research and development (Federal project " Development of advanced infrastructure for research and development in the Russian Federation");

3) digital platforms for research, development and interaction with investors; digital platforms for research and development in the network of scientific and educational organizations and technology companies of the Russian Federation.

It is also planned to provide free access to scientific and educational organizations on the basis of an annual subscription in the information and communication network " Internet "to popular scientific journals, their collections, databases of scientific citations, resources containing information and lists of scientific information and results (Federal project "Development of advanced infrastructure for research and development in the Russian Federation"). At the same time, the creation of a national scientific and educational interactive encyclopedia portal, initiated by the decree of the Government of the Russian Federation dated 25.08.2016 No. 1791-R, is not provided for in the above-mentioned national project.

That is, in essence, the implementation of the national project "Science" will be limited to the organization of information interaction of joint research, access to existing databases containing scientific information. Unfortunately, there is no question of ordering the existing information or the process of obtaining new knowledge. Thousands of researchers will implement research projects separately, without having a full understanding of what information has already been obtained by other authors, what methods were used in the process of obtaining it, how much this or that hypothesis or theory has been confirmed. This approach will certainly not allow the integration of scientific knowledge.

4. Integration of scientific knowledge based on a single information system

The most optimal approach is to create a unified system of scientific information, which can be presented somewhat simplistically in the following form (Fig. One).

The proposed scheme of organization of a unified system of scientific information assumes that:

1. The system is regularly and promptly updated as new scientific papers and sources of information become available. By investigating the same phenomenon, scientists from different fields

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will be able to get up-to-date data online in a timely manner.

2. Information in the system is evaluated for its ranking and use both within the subject area and in related research. Each hypothesis or theory in this system can be presented in text and graphic form, which will give an understanding of the relationship of the specified area of knowledge with related areas.

3. The system can be used as an online textbook (for universities, General education schools), which will also be quickly adjusted as the accumulation of proven knowledge with a high degree of reliability.

4. The system can perform the functions of a search platform that works with periodicals.

5. The system itself is a source for publishing scientific information, a single online journal containing scientific articles, and also serves as an electronic library.

6. The system will allow an objective approach to the selection of applications for financial support for research, including grants, ensuring transparency of this procedure.

The unified system of scientific information actually combines four main components – an electronic encyclopedia, an electronic library, an electronic journal, and an electronic textbook. It can serve as a platform for interactive communication between researchers, including University teachers and students, and integrate scientific organizations into a single information network, reducing to a minimum the costs that arise due to the serious disunity of the scientific community.

In addition, it is necessary to develop recommended research standards. These standards will make it easier to integrate new knowledge into the information system. For example, the standard may include, in particular, the following components: 1) a description of the phenomenon under study with reference to the relevant subject area (for example, human behavior in a particular area, a physical phenomenon); 2) a hypothesis (a possible explanation of the phenomenon); 3) applied research methods, allowing to verify the authenticity of received knowledge, including quantitative and qualitative techniques for the collection and processing of information (e.g., description of the experimental parameters of the sociological survey); 4) conclusions. The study itself is used as an Appendix, which contains more detailed information.

Such a standard of research, which is actually already implemented by many scientific journals, will allow using research results as a primary cell of the information system, which will later also be used in educational electronic resources hosted in the system. The same primary cell can be implemented to create an electronic encyclopedia based on the system.

The information system should have the status of a state system, which will ensure the stability and security of its functioning. Publication should be published exclusively free of charge, in open access mode, if possible in both Russian and English. The most optimal approach is to create the above-mentioned system on the basis of a consortium of Russian and foreign universities. The most expensive and time-consuming part is, of course, the creation and maintenance of an electronic resource, its administration, editing of publications, as well as the work of experts to assess the degree of reliability of research (this role can be played by authorized users with academic degrees, who will get acquainted with the materials posted in the information system and set ratings, which will allow users to navigate in publications).

At first glance, it may seem that the proposed system will be too cumbersome, since it will require storing and processing a huge amount of information. However, it seems that in each field of science there are relatively few ideas around which the bulk of research" revolves". Countless other hypotheses, theories that do not have a high degree of confidence, or have a purely private nature, will be ordered with these ideas in mind, which will avoid confusion and errors when trying to test them, use them in other studies.

The system will minimize plagiarism due to the ordering of the information space, as well as "filter out" millions of publications with extremely low scientific potential, without excluding them from the system. As soon as the author tries to present

the results of their work in accordance with the recommended standard of scientific research, users will immediately be able to evaluate it in terms of scientific knowledge criteria. Of course, expert assessments placed in the system cannot claim to be a universal tool for determining the level of scientific work reliability. However, they will serve as a guide in the search for the necessary information.

The creation of a unified system of scientific information will optimize budget expenditures at all levels, since it will eliminate the cost of issuing paper versions of periodicals. The introduction of electronic textbooks will make it possible to recoup all expenses, or at least most of them, taking into account the funds allocated by the state for the corresponding purposes . Most importantly, the proposed system will speed up the process of obtaining new knowledge, which will bring tangible benefits to society in the near future.

5. Conclusions.

It should be noted that alternative projects may also be considered, providing for the creation of similar systems that operate in certain areas of science either on a commercial basis, or without the participation of the state, etc. However, all of them have disadvantages that do not allow to fully integrate new scientific knowledge and organize existing information. Thus, an attempt to make the project commercially successful will put profit first, which will not make the system open to all users, including those who are unable to pay for the relevant services. At the same time, the trend of recent decades is the transition to open access systems, the introduction of the principle of openness of scientific information [11, p.70]. The public status of the information system will not ensure the stability of its existence, and will increase the risks associated with its operation. The orientation of the system on a specific area of knowledge will not allow you to fully integrate science. Therefore, the proposed solution to the problem is the most optimal, which is also not without some disadvantages. At the same time, the very need to develop the information infrastructure of scientific research is not in doubt.

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