ICT-method for control of virtual rank-trajectory for researcher on automobile and road construction industry

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Abstract. This article raises questions about the processes of bibliometric ICT-tools used by the scientific community in the automobile and road industry. This refers to scientific developments in the field of digitalization, in the operation of motor vehicles services, maintenance and design of highways, safety and traffic management. Modern ICT-methods can be implemented in the form of work with abstract and bibliographic databases, such as Web of Science, Scopus, Russian Science Citation Index, which show scientometric indicators of the publication activity of scientists, individual groups of researchers, organizations and journals. The following areas have been studied in the areas of scientometric databases: automotive industry, road complex and traffic flow management. Our study is devoted to the search for the above areas in the bibliography and the development of methods for providing a separate study to build its scientific activities and publication activity on an international scale. The study revealed that the above areas also include many other areas that, one way or another, affect the interests of other scientific fields. Due to the fact that the scope of scientometric databases is different, in order to study the scientific activities of scientists or journals, it is necessary to consider all indicators comprehensively in all databases. The rating trajectory of Doctor of Engineering Sciences, Professor M. Yashina, was also constructed, according to Web of Science, Scopus and Russian Science Citation Index.

1. Introduction

Nowadays there are various rating scientometric tools such as Web of Science, Scopus, Russian Science Citation Index (RSCI) and so on. They are available anywhere in the world and automatically calculate the rankings of individual researchers, scientific publications and universities. Unlimited use of Web of Science and Scopus by researchers requires a subscription from the organization in which the researchers operate, while RSCI is a public platform.

However, there are difficulties for different branches of knowledge. If for classical Sciences, such as mathematics, physics or chemistry, these tools have been developed for a long time and have a representative base, then for interdisciplinary newly formed topics this is not the case. This article discusses 27 areas that relate to the digitalization of development in the operation of road transport and service, maintenance and design of highways, safety and traffic management. These areas, one way or another, affect the interests of other scientific fields. Scopus service covers and indexes 7820 scientific journals, books, conference proceedings and industry publications.
Important and considerable merit of Thomson Reuters is building a search platform (or database) Web of Science (hereafter WoS), which now belongs to Clarivate Analytics. This platform is known and recognized all over the world. In 2014, the 50th anniversary of the search platform was celebrated. During this time, it has become a means for research activities and a means of information exchange in different scientific fields. The anniversary, which was celebrated by the company, in truth, is not even the anniversary of WoS, and Science Citation Index (SCI), which was created and used before WoS.

Today, the WoS database is a huge network with access to information about many things: people, countries, documents, subjects, organizations, etc. It is the most authentic and reliable source for combining information from scientific sources. Web of Science now has an updated legible user interface, increased content and web access for its subscribers. WoS service is widely used by owners of publications, readers and experts of scientific literature. Finding the right scientific literature before the SCI citation index was developed was very difficult. In the 50-ies of XX art. doctor of philosophy Eugene Garfield proposed the idea of creating a registration of cited sources in published materials of scientists. This innovation made it possible to register and track references to citation sources, establish links with other scientists/institutions and find works by other authors on similar fields [1].

The first issue of SCI was printed, then put on magnetic tape and on CDS. And after the social Science Citation Index (social Sciences) and Arts and Humanities Citation Index (Humanities and arts) appeared, they entered the SCIE database, which represents an extended version of SCI. And then there was WoS.

A similar situation is observed with the Scopus database. Scopus is a bibliographic and abstract database and tool for tracking the citation of articles published in scientific journals. The database indexes scientific journals, conference proceedings and serial books. The developer and owner of Scopus is Elsevier publishing Corporation. The database is available on a subscription basis through a web interface. The search device is integrated with the Scirus search system for web pages and the patent database.

As in the case of WoS, Scopus consists mainly of journals published abroad, the largest share of which are publications in the field of natural and exact Sciences. Perhaps the only Russian journal in which the results of scientific research in the field of pedagogy can be published is the journal of the Russian Academy of Sciences “Social Sciences”, published in the USA, in Minnesota.

Russian science citation index (RSCI) is a bibliographic database of scientific publications of Russian scientists. RSCI project has been developed since 2005 by “Scientific electronic library”. With the help of the RSCI database, a scientist can find out the index of his citation. This index will be lower than the true one due to the "limited list and retrospective of processed journals, dissertations and dissertation abstracts". The manual also describes the procedure for determining the citation index for a scientist.

WoS was founded in 1963, while Scopus and RSCI in 1996 and 2005 respectively, resulting in different coverage of journals and publications.

2. Statement of problem

Various national projects have been launched in the Russian Federation. Of great importance is the National project – Safe and quality roads [2].

The National project “Safe and quality roads” sets goals:

1. The increase in the share of regional roads that meet regulatory requirements in their total length to at least 50 percent (relative to their length as of December 31, 2017), as well as the approval by the state authorities of the subjects of the Russian Federation of such standards on the basis of established at the Federal level requirements for road safety.

2. Reduction of the share of Federal and regional roads operating in overload mode in their total length by 10 percent compared to 2017.

3. Reducing the number of places of concentration of road accidents (accident-hazardous areas) on the road network twice compared to 2017.
4. Reduction of mortality as a result of road accidents by 3.5 times compared to 2017 – to a level not exceeding four people per 100 thousand population (by 2030 – the pursuit of zero mortality).

To achieve these goals, the following tasks are to be solved:
1. Bringing the proportion of regulatory-compliant roads in the largest urban agglomerations to 85 per cent of their total length.
2. Application of new mechanisms for the development and operation of the road network, including the use of infrastructure mortgages, life cycle contracts, the best technologies and materials.
3. Bringing the standard of transfer of tax revenues of budgets of subjects of the Russian Federation from excises on fuels and lubricants to 100 percent.
4. Implementation of a public information system for monitoring the formation and use of road funds at all levels (in 2019).
5. Creation of mechanisms of economic stimulation of safety of highways of regional and local importance.
6. Introduction of new technical requirements and standards of arrangement of highways, including on the basis of digital technologies, aimed at elimination of places of concentration of road accidents.
7. Implementation of automated and robotic technologies of traffic management and monitoring of compliance with traffic rules.
8. Strengthening the responsibility of drivers for violation of traffic rules, as well as increasing the requirements for the level of their professional training.

The national project fixed, in particular, the need to bring to the normative state of at least half of the regional roads. Since large amounts of funding are allocated for this purpose, scientific justification is needed to ensure the effectiveness of the investment.

As of the end of March 2019, last year the number of publications by Russian scientists in journals indexed by Scopus and Web of Science Core Collection (WOS CC) exceeded 98,000 and 75,800, respectively. Recall that measures to increase publication activity are taken, in particular, within the framework of the national project “Science”. The national project formulated key indicators, among them-the place of the Russian Federation in the share in the total number of articles in the areas identified by the priorities of scientific and technological development [3].

It is required to develop indexable tools to determine the individual strategy to improve the scientific rating, taking into account changes in web-resources.

![Figure 1. Areas of scientific journals, books, conference proceedings and industry publications indexed in Scopus](image-url)
A total of 27 areas relate to the digitalization of development in road transport operation and service, maintenance and design of highways, safety and traffic management (Fig. 1). These areas, one way or another, affect the interests of other scientific fields. Scopus covers and indexes 7820 scientific journals, books, conference proceedings and industry publications.

Our research is devoted to the search for the above areas in the bibliography to the development of methods to ensure individual research to build its scientific activity and publication activity on an international scale.

3. The algorithm of formation of the rank-trajectory
The main scientometric indicator, from which the rating of the scientist is formed, is the citation. In this case, to build the rank-trajectory of doctor of technical Sciences, Professor Yashina M.V. for 2014–2018, we used information from WoS, Scopus and RSCI broken down by year.

Previously, to study the publication activity of the author in WoS, it was possible to use the Researcher Id platform. However, in 2019 there was an integration of author profiles from Researcher Id to the new platform Publons, which allows to record the work of a scientist as a reviewer, expert and editor, to keep statistics, to offer their services in this field. It is worth noting that researchers form their own profile. Posts to the author’s profile are not automatically backed up. Publication activity is represented by a histogram of publications and a citation graph (Fig. 2). According to the metric, the citation graph begins in 1968, although the histogram shows that the first publication was made in 1986, which may not be possible, because publications could not be cited before they were published. This is a good example of what information should be tracked and how it is displayed in the profiles of researchers.

Scopus automatically generates author profiles. However, if you find inconsistencies, you can send a request to the moderators of the site and they will correct all errors. In Scopus, publication activity is also represented by a histogram of publications and a graph of citations of the author (Fig. 3).

In RSCI it is possible to view various statistical reports on the activities of the researcher, including the report "distribution of citations by years of cited publications”, which is represented by a diagram (Fig. 4).

On the basis of the available information, it is possible to make a joint schedule of how Professor M. Yashina's works for 2014–2018 were cited (Fig. 5). The graph fully illustrates how information in different bibliographic and abstract databases can differ. Based on the information obtained on the example of indicators of citation of works, it can be concluded that in order to give a real assessment of the scientific activity of not only the author, but also scientific publications and universities, it is necessary to consider the indicators in different databases comprehensively.
Figure 3. Statistics of the number of publications and citations by year Professor M. Yashina in Scopus.

Figure 4. Statistics of the number of citations by years of Professor M. Yashina in the RISC.

Figure 5. Statistics of the number of citations by year of Professor M. Yashina in Publons.
4. Conclusion
The article presents an algorithm for the formation of the rank-trajectory. It should be noted that for researchers to improve their rating and the rating of the organization in which the scientist works, it is necessary to publish their scientific works in those publications that are indexed by abstract and bibliographic databases.

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