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Performances of the e-Nauka Portal in the Republic of Serbia and Its Significance for Researchers

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Abstract: In recent years, digitalization has been recognized as a significant and necessary process that leads to better results, both in the education and in the scientific research. The legal and strategic framework in the Republic of Serbia follows the modern trends of the concept of open science, open knowledge, digital transformation and a unique digital format of scientific production. The Ministry of science, technological development and innovation, in cooperation with the Office for information technology and electronic administration, created the necessary conditions for dynamic the development of the scientific research and innovation system, especially in relation to the digitalization process and the establishment of an information platform, in the form of a unified national information system of scientific research activities: eNauka [eScience]. The concept of eNauka is an innovative tool that improves the efficiency and transparency of scientific processes in Serbia. The eNauka portal in the Republic of Serbia is dedicated to promoting scientific research, innovation and academic achievements within the scientific community of the Republic of Serbia. This portal provides access to scientific articles, research papers and academic publications authored by researchers from Serbia, which enables the spread of knowledge and the encouragement of scientific cooperation within the country. The eNauka portal was opened in full capacity for all active researchers in Serbia on July 3, 2023, and contains data on scientific research organizations in the Republic of Serbia, researchers and their scientific results. The goal of this paper was to bring closer to the academic community the capabilities and performance of the eNauka portal, its structure, the way and importance of data editing, with special reference to issues related to researchers' profiles and their editing. The paper is methodologically based on a theoretical, preliminary desk analysis of relevant contemporary standpoints in domestic and foreign theory, a normative analysis of current legislative sources, an inductive and deductive approach in researching the operational performance and advantages of the eNauka portal, as well as the quantitative analysis of relevant statistical indicators of relevant parameters regarding the profile that each researcher has on the eNauka portal. The results include the analysis of data related to editing the researcher's profile and the opportunities offered by the eNauka portal. The conclusion refers to the importance and advantages of the eNauke portal. Finally, it should be noted that one of the key functions of eNauka is the evaluation of scientific results. More precisely, the system provides the possibility of monitoring and evaluating research results, which is of great importance for the academic community.

Keywords: *digitalization, scientific research organizations, scientific results, researchers, science, eNauka*

Introduction

Digitalization processes in modern work and business are a consequence of global technological changes. The generation of increasingly large amounts of data in various areas at the global level necessitated the transition to a digital format for data collection, storage and exchange.

In recent years, digitalization has been recognized as a significant and necessary process that leads to better results, both in the sphere of education and in the field of scientific research. The integration of digital technologies into scientific research work represents a key segment of its faster and better development, and as such, is a priority in relevant legal solutions, strategic documents and practical work of each individual scientific research organization [NIO – Naučno istraživačka organizacija] (Gorenšek and Kohont, 2019). Namely, "the acceptance of digitalization as an important and necessary element of

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modernization is especially recognized in the domain of higher education, which is in closest contact with specific educational profiles and the labor market" (Kolarski, 2022, p. 50). According to Article 2 of the Law on Science and Research, science and research as an activity of special importance for the overall development of the Republic of Serbia, based on knowledge, experience and skills, together with higher education is the driver of economic and overall social development.

The processes of digitalization and digital transformation in various spheres of life and work of modern man are essentially not a choice, but an imperative to survive and function in an extremely competitive market, which no longer knows classical geographical boundaries, but operates in a cyber environment that is very particular regarding to both spatial and time dimension. Digital transformation, "by stimulating changes in the expectations of end users, simultaneously creates completely new user and business experiences" (Čelik, 2021, p. 5), which is an extremely important determinant in the sphere of scientific research work.

The degree of digitalization in modern work and business is most often assessed by monitoring the following parameters: "presence, accessibility, reliability, speed, usability and skill" (D'Souza and Williams, 2017, p. 6). It should also be said that innovations "which have increasingly expanded during the 21st century, showing the changeability and adaptability of people's lives and business around the world. There is an increasing demand for the commercialization of the results of scientific research and intellectual property, and close cooperation between scientific research institutions and the economy is recognized as a driving force for the further development of national economies. The relevance of innovation and the transfer of knowledge and technologies has been in national and EU strategic plans for years" (Stefanović et. al., 2021, p. 10).

According to authors in contemporary theory, "digitalization itself brings new opportunities and challenges" (Todosijević and Hristić, 2022, p. 197). If we take a closer look at the situation in science, in the last three decades, primarily as a reflection of the extremely rapid development of information and communication technologies, there have been significant changes in the way of preparation, publication and generally in the way of dissemination of scientific results. According to some authors, "the digitalization process enabled a technically simple and fast way of publishing, saving, searching and downloading publications, and scientific results became available to everyone" (Banović and Bradić Martinović, 2021, p. 397). According to the same authors, »globalization and the development of digital technologies in recent decades are transforming all fields of science, and information and data are becoming available to everyone, in a technically simple way. The development of digital technology has also significantly changed communication among researchers" (Banović and Bradić Martinović, 2021, p. 397).

Finally, the digital format of scientific results for modern researchers is an extremely important way of their storage and exchange, bearing in mind that "digitalization of information facilitates their storage, access, presentation and sharing" (Zdravković, 2022, p. 1).

According to the official data of the Ministry, "The Ministry of science, technological development and innovation, in cooperation with the Office for information technology and electronic administration, created the necessary conditions for the dynamic development of the scientific research and innovation system, especially in relation to the process of digitalization and the establishment of an information platform, in the form of a unified national information system of scientific research activity: eNauka [eScience]. Modernizing the management of the scientific research sector using information and communication technologies aims to connect all available data, record scientific results and, for the first time, implement the electronic business model in the implementation of relevant administrative procedures that lead to the development of scientific research personnel and the improvement of the quality of scientific research work of general interest" (eNauka, Ministry of science, technological development and innovation, 2024).

The end result of this project is of essential importance for the scientific community of the Republic of Serbia, as well as for society as a whole is the fully functional informational system eNauka, with the aim to unify complete scientific production at the one place and to enable verification of scientific results of institutions and researchers as well.

Also, the Strategy for scientific and technological development of the Republic of Serbia for the period from 2021 to 2025, "The Power of Knowledge" (hereinafter referred to as the Strategy), recognized the relevance of scientific research work, which can be seen from the defined general goal of the Strategy "to accelerate development of the Republic of Serbia through improving the quality and efficiency of science, technological development and innovation." The strategy envisages a series of measures that

will at the same time strengthen "1) institutions, 2) researchers and 3) research teams in the scientific research and innovation system". In this Strategy, science is recognized as "an important component of the development of the Republic of Serbia, just like any other society. Technological progress, health, safety, education and national identity rest on the power of science to create, expand and apply knowledge, which determines the overall quality of life of citizens. In the 21st century, the need for top science is even more pronounced, because the further development of the economy and society is increasingly based on knowledge as a key resource, while the number of social challenges that can only be solved with new knowledge is increasing."

The eNauka was opened in full capacity to all active researchers in Serbia on July 3, 2023. The goal of the work is to bring closer to the academic societythe capabilities and performance of the eNauka portal, its structure, the way and importance of data editing, with special reference to issues related to researchers' profiles and their editing.

The performances of the enauka portal and the importance of the unique digital format of scientific production

Digitalization of science is part of the overall process of digitalization of society and economy (Pleskach, et al., 2020). Many authors point to the fact that digitalization is one of the key, if not decisive, characteristics of the modern world (Wachal, 1971). It is emphasized that the scientific community is well on its way to achieving a unique communication infrastructure, and that digitalization - by reducing communication to its basic components - produces a *lingua franca* capable of facilitating universal communication (Dijk, 2006). The digital format and newer media as ways of their preservation and dissemination were recognized in theory even before the national scientific communities started implementing digital technologies (Sassen, 1998; Sanders, 1974). Regardless of omnipresence and visible longstanding influence of digital transformation, it should benoted that until recently, academic literature paid surprisingly little attention to this development. It has only recently begun to deal with the topics of digitalization and digital transformation (Venkatraman, 2017; Verhoef, et al., 2021). Research today points to the fact that digital media have already become the central pillar of global trends in the field of science at the global level (Gorenšek and Kohont, 2019). It is precisely the digital format of scientific production that is the foundation and support of the concept of open science, which can be defined in several ways; many theorists point out that it "actually represents the transformation of science - from closed and traditional learning, to opening, sharing and digital news" (Portal eNauka, 2024), and that "open science is much more than the application of new technologies in the classical process of scientific production" (Smederevac et al., 2020, p. 23). Open science primarily implies "open access to scientific publications, open access to primary data, transparency of scientific communication and methodologies and also a development of digital infrastructure" (Open Science and Open Data, 2024).

The legal and strategic framework in the Republic of Serbia follows the contemporary trends of the concept of open science, open knowledge, digital transformation and a unique digital format of scientific production.

According to Article 3 of the Law on science and research, "Science and research are systematic creative work undertaken for the purpose of creating new knowledge, with the aim of raising the general civilizational level of society and using that knowledge in all areas of social development". According to Article 4 of the same law, "science and research are based on the following principles: freedom and autonomy of scientific and research work; to the public access to scientific and research work and the results of that work, in accordance with the law; scientific and professional criticism; respecting the standards of science and profession; application of international standards and criteria in evaluating the quality of scientific and research work in each field separately, in relation to its specificity; competitiveness and excellence of scientific programs and projects; ethics of scientific and research work, in accordance with the principles of good scientific practice; gender equality in science and research, as well as in decision-making bodies; connections with the education system and especially with the higher education system; openness to international scientific and technological cooperation; conducting research in accordance with the principles of open science; concerns for sustainable development and environmental protection; originality and authenticity".

Article 6 of the Law on science and research regulates with its provisions that in order to increase the

quality and visibility of scientific work, "research should be conducted in accordance with the principles of open science, with optimal use of the scientific research infrastructure." The principle of open science and open access to scientific publications and primary data is based on the recommendations of the European Commission and international good practice. Scientific research infrastructure includes facilities, capital scientific equipment, machinery and objects, information within collections, archives and scientific data, e-infrastructures as well as databases, computer systems and communication networks, services and any other tools necessary to achieve excellence in science and research".

Pursuant to the provisions of Article 8 of the Law on science and research, the goals of the implementation of scientific research activity are: »creating new knowledge to encourage social, technological, cultural, artistic and economic development, increase the social product and raise the standard of citizens and the quality of life; preserving and improving the general fund of knowledge, as a condition for understanding, strengthening and contributing to world development processes; improvement of overall scientific research capacities (human resources and institutions); raising the general level of technologies in the economy and ensuring the competitiveness of goods and services on the domestic and world markets; strengthening of international scientific cooperation and contribution in the regional, European and global research area; support for the creation of innovations for the economy, the transfer of technologies and the strengthening of engineering capacities with the aim of creating comparative advantages on the global market and promoting entrepreneurship; improvement and expansion of the cultural and artistic environment and creative education, with the aim of preserving and affirming national identity as a part of civilizational heritage; systemic encouragement of cooperation between institutions, as well as the mobility of researchers, that is, research and administrative staff within the Serbian, regional, European and global research space".

Serbian scientists and researchers recently received a unique information system called e-Nauka, which represents a significant step forward in the digitalization of scientific processes. This system allows researchers to access all scientific works on the system in one place, which facilitates access to relevant information. "The portal was developed on the basis of the open-source software DSpace-CRIS optimized by 4SCIENCE, which enables maintaining profiles of researchers and scientific research organizations, collecting scientific production, monitoring citations and the like. The eNauka portal is aligned with international standards and practices to enable interoperability and data transfer" (eNauka - instructions, 2024).

The eNauka portal consists of two parts: administrative and scientific. The administrative part is not publicly visible, and contains detailed administrative data about scientific research organizations and researchers. A scientific research organization (NIO) is an accredited institute or higher education institution, as well as an institution of national importance, which meets the requirements for carrying out scientific research activities according to the provisions of the Law on science and research, and which is registered in the Register of scientific research organizations. A researcher is a person who is registered in the Register of researchers, according to the provisions of the Law on science and research. By registering in the Register of researchers, the researcher receives a profile on the eNauka portal, which is linked to their ORCID profile. Each researcher also has a Researcher Identification Number [IBI – Identifikacioni broj istraživača], which is assigned to him or her in the administrative software portal (Portal eNauka, 2024).

The NIO officer, the NIO editor and the researcher are responsible for the editing and accuracy of the data on the eNauka portal.

The NIO officer is a person authorized by the scientific research organization, in charge of editing basic data about the scientific research organization and its researchers (Register of researchers and Register of scientific research organizations in the Republic of Serbia - basic information, 2024).

The scientific part of the eNauka portal is publicly visible, it contains part of the basic data on scientific research organizations, it is edited by NIO editors and researchers, all with the aim of insight into the scientific results of both scientific research organizations and researchers in the Republic of Serbia. The NIO editor is responsible for the accuracy and quality of the data within his scientific research organization, including data on scientific results submitted by researchers. The name of the authorized

NIO editor is publicly available within the detailed data on the profile of the scientific research organization in eNauka. In most cases, the NIO editor is a librarian, less often a researcher. Each scientific research organization decides who would perform this function individually.

A researcher is a person in an active scientific or research title, registered by the NIO officer. Their responsibility is to edit their profile, as well as data on their scientific results.

Regarding the structure of the platform, the eNauka portal consists of four main segments: Scientific and research organizations, Researchers, Results and Statistics.

The results represent publications, technical solutions, patents and the like, which the researcher achieved in their scientific research work. All results are linked to researchers and their NIO (eNauka - instructions, 2024). The results »are displayed with available information (title, list of all authors, publisher, data source, etc.), including all internationally recognized permanent identifiers (e.g. DOI, WoS-ID, Scopus-ID, PubMed-ID). For the results that were downloaded from institutional repositories, a link indicating the original content in the original repository of the institution where the work was deposited is shown. The page for displaying an individual result also shows other data obtained through the normalization process, such as the proposed value of the scientific result (M category), more detailed data on the source of publication (ISSN, journal, ISBN...), as well as all established identifiers. This page is connected to all external sources, so it facilitates the verifiability of data, but also enables the counting of citations" (eNauka, Ministry of science, technological development and innovation, 2024).

On the statistics page, "one can gain insight into the number of publications, citations and the number of active researchers for each NIO" (Portal eNauka, 2024).

As of April 15, 2022, the eNauka portal has downloaded data on scientific results from the Register of researchers of Serbia, the so-called RIS system. Also, scientific results are deposited in eNauka through regular weekly downloads from COBISS, then the National repository of doctoral dissertations and compatible institutional repositories (eNauka - instructions, 2024). Researchers can transpose their scientific results from ORCID.

In addition to the automatic download of results from existing institutional repositories, the COBISS library system, the NaRDUS repository of doctoral dissertations defended, the "Naši u WoS" service, the National Library of Serbia, there is also a manual download of results, initiated by the researcher, from the following available sources: ORCID, by selecting the results taken from the researcher's ORCID profile; Scopus, by specifying the Scopus ID of the work; PubMed, by specifying the PubMed ID of the paper; CrossRef, citing the DOI of the paper. These results will be publicly visible only after verification and approval by the NIO editors (Register of researchers and Register of scientific research organizations in the Republic of Serbia - Basic Information, 2023).

ORCID (Open Researcher and Contributor ID) is an organization that maintains an open and independent database of researchers and their scientific work worldwide. Based on the entered personal and professional data, an alphanumeric code is generated that represents a unique tag for the identification of the researcher. In this way, the problem of recognition of the author is solved and his identifier in the scientific world is permanently defined, being expressed through the ID mark. "This database is interoperable, which means that metadata from other systems can be imported and exported to or from it. It is linked to WoS and Scopus – these two databases supply metadata to ORCID. On the other hand, Web of Science and Scopus use publicly available metadata from ORCID to improve the quality of data on authors (WoS), that is, the quality of author profiles (Scopus) within their systems. Thanks to this integration, both databases can be searched by author's ORCID identifier. If the works cannot be downloaded from any publicly available database, the metadata can be entered in ORCID manually, which means that it is possible to form a complete personal bibliography" (Albahari, 2017).

Nevertheless, the eNauka portal places special emphasis on institutional repositories where all scientific results are deposited in open access. Having said that, it should be also said that open access to scientific publications "implies the right of every Internet user to read, download, save, print and use the digital content of publications without financial expenses, with the obligation to correctly indicate the source of information, and use the content exclusively in accordance with the corresponding license" (Open Science Platform, 2018). Institutional repositories work on the dissemination and improvement of the preservation of the research results of an institution, they increase the visibility of the content whose influence affects potential research. Through their open platforms, they are in the true sense canceling the "one-sided attack" that commercial publishers are making on the research community (Bashir,

2022). Certain metadata about a certain scientific result (article, textbook, monograph, patent, etc.) are deposited in the repository, which are publicly visible even when the full text is not. The obligations of depositing scientific publications in the repository are also stipulated by the Open Science Platform (Open Science Platform, 2018). A special topic, we can even say a doubt, is the depositing of scientific results in repositories, as well as the issue of copyright (Šefkušić, 2018; Šefkušić, 2017).

Methodology and source of research data

The subject of the analysis in the paper is the researcher's profile on the eNauka portal, i.e. the structure and meaning of the tabs that make up the profile of a researcher, as well as ways to edit the profile. The authors of the paper decided to devote research to this topic, bearing in mind that eNauka is a relatively new concept of the Ministry of science, technological development and innovation of the Republic of Serbia, and certainly a new portal that technically supports this concept and operationally realizes it in practice, with the aim of creating unique digital format of scientific production of all researchers, from all scientific research institutions in the Republic of Serbia. Indisputably, in the practical realization of all the performances of the eNauka portal, the role of the NIO officer and the NIO editor is significant, but the key role in editing one's own profile on the eNauka portal is played by the researcher himself.

The paper is methodologically based on a theoretical, preliminary desk analysis of relevant contemporary standpoints in domestic and foreign theory, a normative analysis of current legislative sources, an inductive and deductive approach in researching the operational performance and advantages of the eNauka portal, whose founder and creator is the Ministry of science, technological development and innovation of the Republic of Serbia, as well as the quantitative analysis of relevant statistical indicators of relevant parameters regarding the profile that each researcher has on the eNauka portal, regardless of which scientific field they belong to and regardless of in which scientific research organization they are based and employed.

The research is based on the official data of the portal eNauka, Ministry of science, technological development and innovation, which are available to all registered researchers in the Republic of Serbia (eNauka, Ministry of science, technological development and innovation, 2024). The research includes an analysis of the parameters of all the tabs that make up the structure of the researcher's profile on the portal.

Editing the researcher's profile - opportunities offered by the eNauka portal and discussion

Every researcher who is active and/or employed in a scientific research institution has the opportunity to access or log in to their profile in eNauka. Data that researchers can add to their profile are variants of surname and first name, biography, interests, photos, as well as the addition of certain identifiers (Scopus ID, Researcher ID, Google Scholar ID). In addition to the above, every researcher has the possibility to download data about their scientific results from their ORCID profile, from CrossRef, Scopus and PubMed. When downloading this information, which is not on his profile in eNauka, and in order not to duplicate it, the researcher should first take a closer look at the record that he wants to send to the NIO editor for verification.

It should be noted here that the NIO editor is a person authorized by the NIO, in charge of editing the public profile of the NIO and verifying data on the scientific results of researchers, with possible changes or additions to these data, but not their entry (Register of researchers and Register of scientific research organizations in the Republic of Serbia - basic information, 2024).

The eNauka portal also provides an option for publications, that is, scientific results that already exist in eNauka, but are not attached to the researcher's profile, by using the «Add information to your profile» [Pridružite informacije svom profilu] option. By using this possibility, the researcher actually confirms the authorship, or permanently rejects (removes) it, depending on whether he is the author (or co-author) of a particular paper. The reason for introducing this option is the fact that there are researchers who have the same (or similar) last name and first name, and in this way researchers are involved in order to recognize their scientific results and add them to their profile.

Every researcher has the opportunity to see the list of edited and approved publications (scientific results) that they downloaded from external services and are verified by the NIO editor. Having in mind that certain scientific results are taken from other systems, the researcher can use the «Publications on my profile» [Publikacije na mom profilu] option. By using this option, the researcher has the possibility to view all the scientific results that are on his profile, which were edited and approved by the NIO editor. By using certain filters, the researcher can view the type of his results (conference paper, scientific article, chapter in a monograph, doctoral dissertation, textbook, monograph, etc.), which are numerically expressed for each type of the listed results. Also, the researcher has the possibility to look at how many scientific results there are in a certain period of time. In addition to the above options, by which the researcher can add certain scientific results to their profile and have insight into them, the researcher also has insight into information regarding his employment in a specific scientific research institution, the percentage of full-time employment, the beginning and end of employment, as well as the scientific title, date when theywere elected to the same and the completion of the election to the title, the name of the scientific research institution where he obtained it, as well as the scientific field, scientific branch and narrower scientific field in which they were elected. The researcher does not have the possibility to change the information concerning their scientific title, because it is edited by the NIO officer. However, if theynotice that certain information is incomplete or incorrect, they can contact the NIO officer, whose name is publicly available within the detailed data in the profile of the scientific research organization ueNauka.

Every researcher who is active, i.e. who is employed in a scientific research institution, has an open profile on the eNauka portal, which anyone who is interested (the so-called unregistered user) can have an insight into. The data available on the eNauka portal about each researcher comprise of the following options: profile, details, results, secondary authorships, indicators and statistics.

The profile of each researcher contains certain data about him or her, namely their name and surname, IBI (researcher identification number), their ORCID ID, information about the researcher's status (active or passive). If the researcher is passive, they do not have the possibility to access their profile. As of June 4, 2024, the number of passive researchers is 10,912, while the number of active researchers is 20,352 (eNauka, Researchers, 2024).

By looking at the second option, „detailed", there is an insight into the variants of the name of the researcher, the ID of the Scientific Record of the Autonomous Province of Vojvodina, the affiliation of the researcher and the eCris ID.

When it comes to the title, within this option we have data on the type of title, the title, the name of the scientific research institution where the title was obtained, the scientific field in which the researcher was elected, the scientific branch and the narrower scientific field.

Taking the social sciences as an example, the number of researchers in the field of teaching and associate professions will be listed below.

Table 1. *Teaching and scientific titles in social sciences*

Teachingtitles	Active	Passive	Total
Professor	855	18	873
Asociate professor	651	2	653
Assistant professor	695	6	701
Teaching assistant	399	1	400
Teaching associate	86	/	86
Total	2.686	27	2.713

Source: eNauka – researchers – social sciences, 2024.Accessed on June 4, 2024.

The Results tab contains specific information about the researcher's results. This tab is divided into five columns: year, title, authors, result type and mp-category. Table 2 shows the total number of scientific results by type of publication, expressed numerically. Based on these data, we find out which type of scientific results is represented to the greatest extent in the scientific production of researchers in the Republic of Serbia.

Table 2.*Scientific results by type of publications*

Type of publication	Number
Article	273.566
Conference paper	261.551
Book parts	59.145
Monograph	27.109
Doctoral thesis	21.218
Other*	16.588
Textbook	14.936
Reviews	3.304
Editorial work	13.305
Contribution to periodical	13.116
Encyclopedia entries	8.809
Technical reports	5.336
Arch works	3.539
Patent	2.771
Report works	1.316
Dataset	201
Public policies	156

* Includescritical reviews, abstracts etc.

Source: eNauka – Results, 2024. Accessed on June 16, 2024.

Based on the displayed information on the type of results, in Table 2 we see that researchers mostly publish scientific articles, followed by conference papers.

The Secondary authorship tab located on the researcher's profile also contains five columns; the result type field contains information about the editorial work or doctoral dissertation. This means that a particular researcher was the editor of a certain collection of papers or a magazine, or a mentor or committee member, for a certain candidate (whose name is visible in the column Authors), and the name of the dissertation is shown in the Title column. In order to have insight into whether the researcher was a mentor or a committee member, we need to «open» the record.

In the Indicators tab, the citations of each researcher's scientific results are shown separately in certain citation databases (Scopus, Web of science, Pub med, Open Citations and Dimensions). At this point, it should be emphasized that it is possible to check the citations of individual scientific research institutions, as well as of the entire University.

Evaluating an author's scientific performance is a very demanding and delicate job. A relevant indicator on the basis of which the author's scientific performance is evaluated is the fact of how many times a certain paper is cited, i.e. used as a source in another work, by another author, but with a similar topic. It is clear that we are referring to citations, which is an indicator of the author's scientific performance (Despotov and Ferizović, 2012).

The eNauka portal allows us to see for each researcher the total number of citations in the specified databases, the total number of results (articles) in those and the h-index. It is important to point out that the number of citations shows the citations achieved for works published in that year, and only for those works that are referenced in that (certain) service. The total number of citations in the service is higher in most cases, because it also includes works that are not referenced in that service.

In the next tab, Statistics, every researcher can see their scientific results according to the preliminary M categories, which are expressed numerically, but also in percentage. Also, the results are shown according to the openness of access, as well as according to the type of results in the last ten years, which are also expressed both numerically and as percentage. The abovementioned M categories are of great importance for researchers because they serve to evaluate the quality of scientific results and are relevant in the process of obtaining scientific and research titles, as well as in the process of

re-election to the title, which is regulated by the Rulebook on the procedure, method of valuation and quantitative presentation of scientific research results of the researchers (Official Gazette of RS, no. 24/2016 and 21/2016).

On the right-hand side, next to the mentioned tabs, there is a field called Cooperation. When the researcher «clicks» on this field, the name of the researcher is displayed in the centerof a round diagram, surrounded by the names of the researchers with whom they collaborated, that is, published the works. It is interesting that by clicking on any name of the researcher (from those offered), information about the affiliation of the researcher or co-author can be found. Also, at the very end, each researcher has a Contact field, through which it is possible to contact the researcher, that is, to send them an email.

The following is a statistical presentation of the results of the scientific performance of researchers in the Republic of Serbia, which are available on the eNauka portal and are relevant for the presentation and evaluation of scientific results.

Table 3 summarizes the citations in eNauka in certain databases, as well as the number of indexed works in those.

Table 3. *Cumulative citation of scientific results in eNauka*

Base	Total number of citations	Indexed works
SCOPUS	1.668.640	102.528
PubMed	301.000	61.380
Dimensions	1.361.060	107.126
OpenCitations	1.463.307	302.853

Source: eNauka – Statistics, 2024. Accessed on July 5, 2023

Based on the data from Table 3, we come to know that the largest number of citations is in the SCOPUS database, although the OpenCitations database contains almost three times the number of indexed works. At this point, it is necessary to emphasize that for precisely expressed citation it is necessary that each scientific result contains certain data. More precisely, if it is a scientific article found in the SCOPUS database, it is necessary that the same one found in eNauka contains the ScopusID in order to display its citations, if the work is cited. For a precise display of citations in the Dimensions and OpenCitations databases, it is necessary that the result contains the correct DOI number, while for citations in PubMed, the result must contain the PubMed Central Id.

Table 4 contains information on the total number of active scientific researchers containing certain identifiers, as well as on the number of male and female researchers.

Table 4. *Total number of active researchers - indicators*

Active researchers	Number	Percent
ORCID	18.256	89,49
eCrisID	19.026	93,27
ResarcherID in WOS	1.558	7.64
ScopusID (Scopus Author Identifier)	4.591	22,51
males	9.338	45,78
females	11.061	54,22

Source: eNauka – Statistics, 2024. Accessed on June 15, 2024.

Based on the data shown in Table 4, we see that the largest number of researchers have eCrisID, almost 94%, while almost 90% of researchers have ORCID. Although we can say that a large number of researchers have ORCID, we believe that it is insufficient because it is necessary for the researcher to have access to their profile and to be able to «log in» to the eNauka portal, so it is necessary that this percentage reach 100%. Also, a small number of researchers have a ScopusID. This is a unique permanent identifier assigned to an author who has published a work in journals that are indexed in the SCOPUS database. (Scopus ID and author profile). Since it is automatically assigned to the researcher, we can conclude that not even a quarter of researchers in the Republic of Serbia have published a work in a journal that is indexed in this database. On the other hand, researchers can register themselves in WOS and thus get their ResarcherID in WOS, but it is obvious that they did not use this possibility because

only 7.64% of researchers have this identifier, or researchers did not enter this information in their profile, which is therefore not visible here. When it comes to female and male researchers, we see that there are about 5% more female researchers in eNauka.

Table 5 contains the cumulative number of works by a certain PID, that is, the number and percentage of works containing a certain PID.

Table 5.*Cumulative number of works by specific PID*

PID number	Number of works	Percent
DOI number	179.326	24,7
WOS-UT	142.266	19,6
ScopusID	127.625	17,58
CobissID	223.545	30,79
PubMedID	23.331	3,21
PMCID	9.957	1.37
Unpaywall*	109.475	15.08

* Information available in open access

Source: eNauka – Statistics, 2024. Accessed on June 6, 2024

Based on the data shown in table 5, the largest number of works contain CobissID, based on which we can conclude that a large number of works have been entered into the COBIS database. A slightly smaller percentage, 24.7%, contains a DOI number, while the smallest number of papers contains a PMCID, which is the number assigned by the National Library of Medicine to papers indexed in PubMed (PMID vs PMCID: What's the Difference?). The reason for the, we can say, small presence of certain PIDs in the scientific results of researchers can be twofold. First, certain scientific results, such as e.g. scientific papers published in proceedings very rarely contain specific PIDs and are rarely in open access. Second, it is possible that a large number of scientific papers «accidentally» do not contain a particular PID because the researchers did not enter it. Therefore, it is necessary to appeal that each researcher examines their scientific results in detail and to contact the NIO editor if a certain PID is missing, because it is possible to supplement each scientific result. As far as availability in open access is concerned, there is a tendency of increasing it, with the introduction of a repository that will contain scientific results in open access.

Table 6 summarizes the data on certain identifiers, which are shown in numbers and percentages.

Table 6.*Summary of data on certain identifiers*

NIO that have a repository	123	59,13
NIO with included EC PIC*	166	79,18
NIO with NIO editor registered	202	97,12
NIO with NIO officer registered	204	98,08

*Unique identifier for legal entities included in European funding programmes

Source: eNauka – Statistics, 2024. Accessed on June 15, 2024.

Based on the data presented in Table 6, we see that almost all NIOs are active in eNauka, which is confirmed by the data that 97.12% of NIOs have a registered NIO editor, and 98.5% have a registered NIO officer. The situation is not perfect, but we believe that this percentage will soon reach 100%. When it comes to the number of repositories, we see that it exists in 123 NIOs, which in our opinion is insufficient, but it is necessary to take into account that this platform is still in its «infancy» and over time the situation will improve in this area as well.

Finally, it should be noted that one of the key functions of eNauka is the evaluation of scientific results. More precisely, the system provides the possibility of monitoring and evaluating research results, which is of great importance for the academic community. As it was said at the beginning of the paper, eNauka is based on the principles of open science, and all scientific results of researchers should, accordingly, be available, i.e. in open access. In this way, researchers can better understand the impact of their work and identify areas that require further research.

Conclusion

The eNauka concept is an innovative tool that improves the efficiency and transparency of scientific processes in Serbia. This system enables better monitoring of scientific works, evaluation of scientific research results and more efficient management of administrative affairs at faculties, which contributes to the development of the scientific community and encourages further progress in scientific research.

Every researcher who is active, that is, who is employed in a certain scientific research institution in Serbia, has an open profile on the eNauka portal, which anyone who is interested can have an insight into. The data available on the eNauka portal about each researcher are the following fields: profile, details, results, secondary authorships, indicators and statistics.

The aim of this paper was to bring the capabilities and performance of the eNauka portal closer to the academic public – its structure, method and importance of data editing, with special reference to questions concerning the profile of researchers and their editing. Taking into account that the eNauka portal has been «active» only about a year, as well as the engagement of NIO officers, NIO editors and researchers, as shown by the statistical presentation of the results of the scientific performance of researchers in the Republic of Serbia, shown on the eNauka portal and being relevant for the display and evaluation of scientific results, we conclude that the eNauka portal is of high quality, professionally and successfully set up the entire system, which is also constantly improving.

In order to improve this portal, we believe that it would be of great benefit to the entire scientific community to publish news from the world of science, and, accordingly, to inform the public about the latest scientific discoveries, events and happenings in academic circles. In addition to the above, information about upcoming scientific conferences, symposia, workshops and other events related to science in Serbia can be part of the portal, in order to encourage the exchange of ideas and cooperation among researchers. The portal could provide resources and information about funding for research projects, scholarship opportunities, access to laboratory equipment and everything needed for research work. Apart from the above, the portal could contain educational materials, tutorials and courses from various scientific disciplines, in order to support the continuous education of researchers in the country.

Finally, it should be emphasized once again that one of the key functions of eNauka is the evaluation of scientific results. More precisely, the system provides the possibility of monitoring and evaluating research results, which is of great importance for the academic community. As stated at the beginning of the paper, eNauka is based on the principles of open science, and all scientific results of researchers should, accordingly, be available, that is, they should be in open access. In this way, researchers can better understand the impact of their work and identify areas that require further research.

Conflict of interests

The authors declare no conflict of interest.

Author Contributions

Conceptualization, D.L. and M.D.; writing—original draft preparation, J.M.; writing—review and editing, J.M. and M.D.. All authors have read and agreed to the published version of the manuscript.

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