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National infrastructure for technical and scientific information – a cornerstone of Open Science and research visibility in the Republic of Moldova

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Abstract. The national technical and scientific information infrastructure is a strategic component of the research ecosystem in the Republic of Moldova, facilitating open access to knowledge and enhancing the visibility of scientific results. Platforms such as the National Bibliometric Instrument (IBN), the AGEPI databases, and institutional repositories contribute to the archiving, indexing, and sustainable dissemination of scientific output. These digital structures ensure interoperability with international open data networks, in line with the principles promoted by UNESCO. Strengthening the national information infrastructure is an essential prerequisite for increasing the competitiveness of science, fostering international cooperation, and maximizing the societal impact of research results.

Keywords: technical and scientific information infrastructure; Open Science; Open Access; Digital repositories; Republic of Moldova; scientific visibility

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Национальная инфраструктура научно-технической информации — краеугольный камень открытости науки и видимости исследований в Республике Молдова

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Аннотация. Национальная инфраструктура научно-технической информации является стратегическим элементом исследовательской экосистемы Республики Молдова, способствуя открытому доступу к знаниям и повышению видимости научных результатов. Такие платформы, как Национальный библиометрический инструмент (IBN), базы данных Государственного агентства по интеллектуальной собственности Республики Молдова (AGEPI) и институциональные репозитории, способствуют архивированию, индексированию и устойчивому распространению научной продукции. Эти цифровые структуры обеспечивают взаимодействие с международными сетями открытых данных, поддерживая принципы, продвигаемые ЮНЕСКО. Укрепление национальной информационной инфраструктуры является необходимым условием для повышения конкурентоспособности науки, международного сотрудничества и использования результатов исследований на благо общества.

Ключевые слова: инфраструктура технико-научной информации; Открытая наука; Открытый доступ; Цифровые репозитории; Республика Молдова; научная видимость

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INTRODUCTION

Recent technological developments and trends in Open Science and Open Access have had a significant impact on modern research practices, leading to transformations in both the conduct of scientific activities and the dissemination of results. These transformations generate multiple benefits but also pose specific challenges [1].

In the knowledge society, education and scientific research play a decisive role in the economic, technological, and cultural advancement of a nation. However, the true value of these activities is measured not only by the production of results but also by the ability to preserve, organize, and disseminate them in a sustainable manner. In this context, the archiving of research results and scientific outputs becomes a fundamental element for the development and visibility of national science, enabling its interconnection with the international academic environment through various open digital systems and tools.

In this regard, the UNESCO Recommendation on Open Science (2021) promotes open access to scientific knowledge, including research data, through open data infrastructures and research practices that foster collaboration and transparency. UNESCO emphasizes the importance of an open and inclusive scientific ecosystem that reduces disparities in access to knowledge and stimulates innovation and sustainable development [2].

INSTITUTIONAL RESEARCH AND INNOVATION INFRASTRUCTURE IN THE REPUBLIC OF MOLDOVA

The academic community of the Republic of Moldova supports UNESCO's Open Science initiatives through the publication and dissemination of scientific results in various databases and digital libraries. This activity

is supported by competent government institutions through the approval of national strategic programs aimed at improving the quality of public research and increasing its visibility within the global research and innovation space.

In addition, the reform of the national research and innovation system, launched in 2022, is currently underway. According to recent data provided by the National Bureau of Statistics of the RM (2024), research and development activities were carried out in 47 entities, of which 20 were research institutes and centers, 16 higher education institutions, and 11 other types of units. The reduction in the number of entities (20 fewer compared to 2022) resulted from the reorganization of public higher education institutions through the merger of 18 public research institutes with major universities in the country. Of the total number of entities involved in research and development, 30 are state-owned, representing 63.8% [3].

National programs and policies for the development of the research and innovation field

Research and innovation activities in the Republic of Moldova are regulated through state programs such as the *National Program in the Fields of Research and Innovation 2024–2027*, which aims to stabilize the national research and innovation system and progressively transform it to increase the efficiency and impact of investments in research, development, and the modernization of research infrastructures, as well as to support collaboration between the scientific and business sectors [4]. The *National Smart Specialization Program of the Republic of Moldova for 2024–2027 – “Smart Moldova”* – adopts a territorially focused approach based on the country's existing assets and resources, while

also taking into account the specific socio-economic challenges of each region [5].

Additionally, several national government development documents of the Republic of Moldova are noteworthy, such as the *National Development Strategy "European Moldova 2030"* and the *Digital Transformation Strategy of the Republic of Moldova 2023–2030*, among others. These strategic frameworks aim to achieve their major objectives by facilitating private sector access to research and innovation infrastructure, promoting continuous dialogue between science and society, disseminating knowledge, and capitalizing on research results that address global trends and challenges, which also affect the Republic of Moldova through research and innovation activities [6].

Strategic development documents related to the field of research and innovation demonstrate the state's commitment to strengthening the national scientific system and shifting the focus of science toward openness, internationalization, and cooperation between the academic and economic sectors. This is achieved through the creation of an ecosystem in which science becomes better grounded, more transparent, reproducible, efficient, and cumulative. The overarching goal is to democratize access to knowledge, making it useful for education and training, as well as for the economy, public policy, citizens, and society as a whole.

In the Republic of Moldova, support for Open Access is based on two synergistic models: self-archiving in institutional repositories and publishing in open access journals. The implementation of Open Science principles at the national level is regulated by the *Methodology for Financing Research and Innovation Projects*, which stipulates that the results obtained from projects funded by the state budget must be published in

open access — a requirement explicitly included in project funding contracts [7].

Research institutions and universities in the Republic of Moldova, in partnership with various stakeholders, are actively mobilizing and cooperating to generate technical and scientific data and knowledge, and to contribute practical solutions to the global challenges and requirements of open access publishing. As of 2024, there are four national digital collections (repositories) and eleven institutional digital collections being developed in the Republic of Moldova [7, IBN, 2024].

The National Bibliometric Instrument (IBN)

The largest open-access digital repository in the Republic of Moldova is the National Bibliometric Instrument (IBN), developed and maintained by the Institute of Information Society Development in collaboration with research institutes and higher education institutions, the Ministry of Education and Research, the Academy of Sciences of Moldova, the National Agency for Quality Assurance in Education and Research (ANACEC), the National Agency for Research and Development (ANCD), the Association of Libraries of the Republic of Moldova, the Electronic Resources Consortium of Moldova, and other partners.

This platform includes articles published in scientific journals, conference proceedings, science popularization journals, and socio-cultural magazines from the Republic of Moldova, covering the period from 1993 to the present.

Currently, the IBN hosts over 231,000 registered scientific articles, of which 188,000 are indexed in Google Scholar, making it an essential resource for researchers and professionals across various fields. The platform also features over 40 local scientific journals officially accredited and recognized by

ANACEC, including 34 journals indexed in DOAJ, 12 in Scopus, and 5 in Web of Science.

IBN also contains more than 500 national and institutional clinical protocols, providing easy access to essential information in the medical field. With over 145,000 accesses, IBN continues to serve as one of the main sources of information for the scientific community in the Republic of Moldova, as well as a major access platform for researchers, students, entrepreneurs, and the general public from other countries — exceeding 2.65 million unique visitors. In terms of human resource indicators, the publications have been authored by more than 105,000 contributors affiliated with over 14,600 institutions.

At the international level, the National Bibliometric Instrument (IBN) is registered in various international platforms and directories, and its content is indexed by scientific search engines such as Google Scholar, which harvests more than 93% of the total informational content recorded in IBN, based on an agreement signed in 2017.

The National Bibliometric Instrument is also listed in the *ROAR (Registry of Open Access Repositories)*, *OpenDOAR (Directory of Open Access Repositories)*, *OpenAIRE Graph*, as well as on the *WEBOMETRICS.info* and *BASE (Bielefeld Academic Search Engine)* platforms. Through these integrations, scientific research from the Republic of Moldova is connected to the international academic community.

To support and promote local research, institutional journals are also indexed in other international open-access databases such as *ZENODO*, *Index Copernicus*, *AGRIS*, *eLIBRARY.RU*, *RePEc*, and others. For example, on the digital scientific library platform *eLIBRARY.RU*, 122 publications from the Republic of Moldova are indexed. Among them, 12 works have a high rating and are

included in the core of the *Russian Science Citation Index (RSCI)*.

Additionally, 34 agreements have been signed with *eLIBRARY.RU* to host journals from the Republic of Moldova. As of 2025, more than 14000 articles from Moldova have been cited within the RSCI core. Besides journals, the platform also hosts 119 books, which have received over 1600 citations.

The RePEc platform includes 12 academic institutions and 3 Government structures of the Republic of Moldova, such as the National Bureau for Statistics, Ministry of Finance and Ministry of Social Protection, Family and Child. Over 50% of all publications indexed on the RePEc platform and registered authors are Academy of Economic Studies of Moldova affiliates [10].

Digital Archive of Doctoral Theses

Another digital product is the digital archive of the National Council for Accreditation and Attestation (CNAA), which contains a total - 3059 full-text theses, of which 321 are habilitation theses. Since, March 2023, this repository has no longer been updated. All doctoral theses have been transferred to and are available in the institutional repositories of the universities where they were defended. Additionally, on the website of the National Agency for Quality Assurance in Education and Research (ANACEC), one can find the annual register of defended theses: <https://anacec.md/>.

AGEPI Databases

The State Agency on Intellectual Property (AGEPI) develops and maintains an open digital platform for research and innovation, available online on the agency's official website: www.agepi.gov.md. AGEPI's databases represent a comprehensive set of electronic information resources containing data on intellectual property rights registered in the Re-

public of Moldova. They provide public access to information on patents, trademarks, industrial designs, geographical indications, and works protected by copyright, among others. At the same time, these databases serve as an effective analytical tool for examining trends in the field of intellectual property.

Institutional Digital Repositories

Although major measures have been undertaken to advance digitization, a significant part of the scientific heritage has not yet been converted into digital format—a fact identified as a challenge in the *National Strategy for Digital Transformation 2023–2030*. In this regard, university and specialized scientific libraries play a key role by developing and maintaining digital archives that store and provide access to the scientific output of the academic community, thereby ensuring reliable and sustainable access to knowledge.

University repositories are based on *DSpace software*. Currently, the Republic of Moldova hosts 11 institutional digital repositories belonging to universities and research institutions, which together index over 67000 scientific and didactic publications. These platforms operate under institutional policy documents on Open Science and Open Access, through which institutions commit to disseminating scientific results, promoting science as a public good, and adopting practices of open, reproducible, and responsible research.

University policies on open access, following the Green Open Access model, have been registered in the ROARMAP (*Registry of Open Access Repository Mandatory Archiving Policies*) as institutional mandates that authorize open access to research results financed from public funds.

The establishment within universities of a reliable and centralized digital archiving system—long-term, publicly accessible, and

universally available—extends access to academic research, enhances the visibility and reputation of universities and their researchers, and strengthens the **competitiveness**, impact, and international recognition of scientific achievements.

Technological Developments and Research Practices

Recent technological advances, such as the development of e-research infrastructures, have had a significant impact on modern research practices, transforming both the conduct of scientific activities and the ways in which results are disseminated. This is evidenced by the growing number of Moldovan scientific works indexed in global scient metric databases: more than 1720 articles in *Web of Science (WoS)* and over 4930 papers in *Scopus*, authored by Moldovan researchers [9].

CONCLUSION

The archiving of research outputs represents an essential process for consolidating and capitalizing on the national scientific heritage. Through the systematic preservation of publications, data, and scientific materials, not only is the knowledge generated safeguarded, but its accessibility for the academic community, policymakers, and society at large is also ensured. A robust archiving infrastructure enhances the international visibility of national research, facilitates institutional cooperation, and stimulates innovation. Therefore, archiving is not merely an act of preservation but also a strategic instrument for the development of science and its integration into the global knowledge ecosystem. The technical-scientific information infrastructure of the Republic of Moldova ensures not only the preservation of publications but also their long-term curation, storage, sharing, and access to research data.

CONTRIBUTION OF THE AUTHORS

Alexandru Stratan – conceptualization, methodology, writing-review and editing.

Elena Bordian – research implementation, writing-original draft writing-review and editing.

ВКЛАД АВТОРОВ

А. Стратан – концептуализация, методология, создание рукописи и ее редактирование.

Е. Бордиан – методология, создание черновика рукописи, создание рукописи и ее редактирование.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

КОНФЛИКТ ИНТЕРЕСОВ

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