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REGISTERING SCIENTIFIC JOURNALS IN UKRAINE: PROBLEMS, DEVELOPMENT OF INFORMATION SYSTEMS ABOUT JOURNALS AND ONTOLOGICAL APPROACH

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Abstract. *The classification and management of scientific journals in Ukraine remain fragmented, with multiple registries operating independently and lacking interoperability. This study examines the structural deficiencies of existing journal databases and proposes a centralized, government-backed registry within the* ***National Electronic Scientific Information System (NAUKA)*** *to serve as the primary authoritative source for journal classification. The research identifies key shortcomings in current repositories, including the absence of unique identifiers, non-standardized data formats, lack of historical tracking, and reliance on manual updates. Through an analysis of existing classification mechanisms, this paper underscores the need for a unified system with* ***automated validation, version control, and ministerial oversight through electronic signature authentication.***

The proposed system aims to enhance transparency and accessibility by integrating ***advanced search functionalities, automated categorization updates, and structured metadata fields*** *such as ISSN, publisher details, indexing status, and classification history. A critical component of this framework is the introduction of a* ***mechanism ensuring Mistry representatives data inputting or approval****, ensuring that modifications to the registry are* ***securely verified and legally sanctioned****. The implementation of this system would* ***eliminate redundant manual processes, prevent discrepancies in classification, and facilitate seamless integration with national and international scientometric databases****. This paper concludes by outlining a structured development roadmap for integrating the proposed module into NAUKA, emphasizing its role in fostering a transparent and standardized academic publishing environment in Ukraine.*

Keywords: *scientific journal classification, research database, NAUKA system, metadata standardization, journal registry automation, ministerial oversight.*

1. INTRODUCTION

The development and proliferation of scientific journal searching tools have significantly transformed the landscape of research accessibility and evaluation. These searching tools serve as a centralized catalogue, aggregating peer-reviewed journals, articles, and other scholarly outputs to facilitate discovery and analysis. Notable examples include Scopus, Web of Science, and PubMed, which are widely recognized for their extensive coverage and rigorous indexing standards. Many of these platforms are guided by recommendation lists curated by governmental or academic bodies, such as the Ministry of Education and Science (MoES) in various countries, which aim to ensure quality and relevance in scholarly communication. For instance, in Poland, the Ministry of Science and Higher Education publishes an annual list of scored journals. When the author publishes in those journals, his paper also receives those points and then accounts for scientific accreditations or during decision making during analyzing proposals' team part to decide if it is worth having funding. Similarly, other countries maintain curated lists to promote reputable journals and combat the rise of predatory publishing, providing researchers with trusted resources for dissemination and citation.

2. LITERATURE REVIEW

Scientific publication indexing tools have become essential ones for accessing and analyzing scholarly literature. These search tools, such as Scilit, Elsevier, and Google Scholar, offer researchers instant access to a vast array of publications, including journal articles, book chapters, and preprints (Arı, 2024; Kocira et al., 2019). Academic teachers and students frequently utilize these resources, with a preference for internet-based publications and open-access databases (Kocira et al., 2019). Recent advancements in open data and software have enabled more sophisticated, reproducible publication studies using desktop tools and embedded relational databases (Spinellis, 2023). The integration of alternative metrics into traditional bibliometric tools further enriches the assessment capabilities, allowing for a more nuanced understanding of scientific influence and outreach beyond traditional citation counts (Yaroshenko & Yaroshenko, 2024)

Current Research Information Systems (CRIS) and scholarly databases are crucial in managing and disseminating research information. ERIH PLUS provides a standardized register of journals in social sciences and humanities, enhancing data comparability across CRIS systems (Lavik & Sivertsen, 2017). A comparative analysis of Web of Science, Scopus, and Dimensions revealed significant differences in journal coverage, with Dimensions being the most comprehensive (Singh et al., 2020). These databases exhibit variations in research output volume, ranking, and subject area composition for different countries (Singh et al., 2021). While Dimensions offers broad coverage of CRIS-related literature, Scopus and Web of Science provide more selective content (Suárez et al., 2022). The inclusion of journals in reputable databases amplifies their reach and impact, fostering collaboration and interdisciplinary research (Thippanna, 2024). However, challenges such as bias and predatory journals necessitate robust quality control mechanisms to maintain the integrity of indexed journals (Thippanna, 2024).

Recent research highlights the importance of publication databases in accounting for scientific activities. Automated systems using APIs from databases like ORCID can efficiently track and manage publication data, addressing issues of duplication through algorithms and database design (Ivanov et al., 2024). Web-based systems have been developed to provide comprehensive information on researchers' outputs, including publications, reports, and copyright certificates, with features to handle equivalent objects and funding sources. Publication databases can also be used to analyze institutional scientific cooperation by examining co-authorship patterns, for example via using the VoS viewer (Jalal, 2019). The use of international open access scientometric platforms has become crucial for disseminating research results and evaluating scientific impact. These platforms offer t ools for citation analysis and collaboration, providing quantitative and qualitative indicators of research performance (Koval, 2022). Overall, these studies emphasize the growing role of digital systems in managing and accessing scientific activities.

One innovative addition to the global ecosystem of scientific databases is the Open Ukrainian Citation Index (OUCI), launched in 2018 by the State Scientific and Technical Library of Ukraine (SSTL). OUCI is an open-access platform designed to index and analyze scholarly publications from Ukraine, integrating them into the international research community. Unlike proprietary tools such as Scopus or Web of Science, OUCI prioritizes transparency and accessibility, offering free access to citation data and metadata for journals, articles, and conference proceedings. It leverages data from sources like CrossRef and other open repositories, enabling researchers to track citation networks and evaluate scientific impact within and beyond Ukraine. Recent studies highlight OUCI's role in enhancing the visibility of Ukrainian research (Shapovalov & Shapovalova, 2023; Струнгар & Плисенко, 2023; Франчук, 2023), particularly in fields like engineering and natural sciences, though its coverage remains narrower compared to larger commercial databases. The platform also supports the development of national scientometric tools, aligning with global

trends toward open science and reproducible research practices.

The integration of recommendation lists and platforms like OUCI into the broader framework of scientific journal databases underscores the dual priorities of quality assurance and inclusivity in modern research. While established tools like Scopus and Web of Science offer comprehensive indexing and advanced analytical tools, they often require institutional subscriptions, limiting access for independent researchers or those in under-resourced regions. In contrast, open-access initiatives, including OUCI and the Directory of Open Access Journals (DOAJ), democratize access to scholarly literature, aligning with the principles of the open science movement. However, the trade-off often lies in the scope and depth of coverage, as well as the sophistication of search and analysis features. Recent analyses suggest that combining data from multiple databases—both proprietary and open-access—can provide a more holistic view of research output, mitigating biases inherent in any single system (Martín-Martín et al., 2021). As scientific journal databases continue to evolve, they remain indispensable for literature reviews, citation analysis, and the broader assessment of scientific progress, bridging traditional scholarship with cutting-edge digital tools.

This paper aims to define problems of the journal information is used and identify the way how to use it

3. RESEARCH METHODOLOGY

In the context of our research, we meticulously formulated a series of specific tasks aimed at conducting an in-depth evaluation and enhancement of the current state of journal databases within Ukraine. Our primary objectives were twofold: first, to perform a comprehensive analysis of the existing data housed within these database systems, and second, to investigate and propose innovative methodologies that could significantly contribute to the advancement and systematic development of scientific registers and databases across the nation. This dual-purpose approach was designed to address both the assessment of the present infrastructure and the exploration of future-oriented strategies for improvement.

Data Collection and Analytical Methodology. To facilitate a robust and thorough data analysis, we undertook an extensive observational study encompassing a diverse array of data sources directly associated with scientific journals in Ukraine. These sources included, but were not limited to, publicly accessible web pages, open data repositories, and official governmental or institutional documents. Each of these resources provided unique insights into the operational frameworks and content repositories of Ukrainian scientific journals. Through this observational process, we systematically identified and delineated the mechanisms employed for data collection, as well as the subsequent processes of interpretation and presentation of this data to end-users. Moreover, we explored potential avenues for the practical utilization of this data, such as leveraging existing Application Programming Interfaces (APIs) or converting the data into machine-readable formats to enhance accessibility and usability for computational analysis.

Development of an Organizational Framework. Drawing upon the findings derived from our comprehensive analysis, we proceeded to devise a structured organizational approach intended to streamline the acquisition and management of official data pertaining to scientific journals and their respective rankings within a unified, centralized system. This proposed framework is engineered to ensure the seamless integration of data from disparate sources while simultaneously enabling real-time updates. Such a capability is paramount in maintaining the accuracy, timeliness, and relevance of the information contained within the system, thereby reflecting the dynamic and ever-evolving nature of scientific publishing in Ukraine.

Visualization and Process Modeling. To effectively communicate and illustrate the intricacies of this proposed scheme, we employed the Business Process Model and Notation (BPMN) methodology to construct a detailed workflow diagram. This BPMN model meticulously outlines each procedural step—from initial data ac-

quisition through to its integration and eventual dissemination—while clearly defining the roles and responsibilities of all involved stakeholders, including data providers, system administrators, and end-users. Subsequently, to enhance clarity and ensure accessibility for a broader audience of stakeholders, we distilled the complex BPMN diagram into a simplified, basic-steps scheme. This condensed visualization retains the core elements of the process, presenting them in an easily digestible format without sacrificing the integrity of the underlying workflow.

Addressing Challenges in the Current Landscape. Our investigation into the existing journal database ecosystem in Ukraine revealed a highly fragmented landscape, characterized by a multiplicity of disparate data sources exhibiting varying degrees of accessibility and standardization. Many of these sources lacked uniformity in data formats, which posed significant challenges to efficient aggregation, interoperability, and subsequent analysis. In response to these identified shortcomings, our organizational approach places a strong emphasis on the standardization of data collection protocols and presentation methodologies. By advocating for the adoption of uniform data formats and consistent procedural standards, we aim to facilitate the seamless integration of heterogeneous data sources into a cohesive and functional system.

Development Real-Time Data Synchronization Approach. A critical insight from our analysis underscored the necessity for real-time data synchronization to accurately capture the dynamic fluctuations inherent in scientific publishing. Journals in Ukraine frequently undergo updates to their rankings, editorial boards, and publication metrics, all of which demand a database system capable of promptly reflecting these changes. To address this requirement, our proposed framework incorporates advanced mechanisms for automated data retrieval and continuous updating. Where feasible, this includes strict data input and further utilization of APIs to establish direct data feeds from centralized sources, ensuring that the system remains current and reflective and used by other users, including the latest data with historical logging.

4. RESULTS AND DISCUSSION

4.1. Current issues of the information about the journals: analysing existing approaches that contained data about the journals

The classification and management of scientific journals in Ukraine face considerable challenges due to the fragmented nature of existing databases and registries. Multiple sources, including official government lists, institutional repositories, and open-access platforms support the Ukrainian scientific publishing ecosystem. However, inconsistencies in data formats, restricted interoperability, and reliance on manual data maintenance hinder the seamless consolidation of these sources into a cohesive journal management framework. The NAUKA journal module, designed to facilitate the organization and evaluation of Ukrainian scientific periodicals, must address these limitations to provide a more reliable and functional solution for researchers, institutions, and policymakers.

The primary authoritative source for journal classification in Ukraine is the official list published by the Ministry of Education and Science of Ukraine, which is formed in accordance with the *Order on the Formation of the List of Scientific Specialized Publications of Ukraine* (with recent updates by order No.433 10.03.2025). This document, available exclusively in PDF format, serves as the official reference for journal categorization but presents several operational limitations shown in Fig. 1. Because it is not structured as a database, retrieving and processing information for integration into digital systems becomes inefficient and technically challenging. Moreover, the lack of built-in search and filtering functionalities limits accessibility, requiring users to sift through extensive records manually. Since updates are performed without automated workflows, maintaining accuracy and consistency across versions is labour-intensive and prone to human error.

A significant shortcoming of this system is the lack of standardized journal identifiers, such as ISSN numbers, which complicates the accurate identification and differentiation of journals. Furthermore, monitoring changes in journal clas-

sification requires continuous tracking of new orders issued by the Ministry. Despite these drawbacks, the list does include a dedicated field indicating the date of a journal's category change, which allows users to trace modifications over time, albeit through a manual review of successive versions.

An alternative digital resource for journal classification is the Data related to Scientific Specialized Journals of Ukraine, accessible through the Diia Open Data Portal (see Fig. 2). This registry provides an XLSX-format dataset that includes journal names, publisher information, specialization codes, inclusion dates, and category designations see Fig.3. While the structured format offers advantages over the static PDF list, downloadable file that does not support real-time updates. Users must manually retrieve and compare new versions of the dataset to track modifications. Moreover, the dataset lacks metadata related to journal indexing in international databases, editorial policies, and historical classification changes. The absence of a version control system further complicates the validation of data corrections and updates. Additionally, the lack of interoperability with other scientometric databases decreases usability of this list.

A more dynamic, web-based solution is offered by the Ukrainian Institute of Scientific and Technical Expertise and Information (UkrISTEI) through the IAS "Ukrainian Scientific Periodicals" platform shown in Fig. X. This system provides categorized lists of scientific journals, including those classified as Category A, Category B, and non-specialized periodicals. Compared to the previous sources, the IAS system offers improved search and filtering functionalities, allowing users to locate journals based on subject areas and indexing status. Moreover, individual

I. Категорія «А»

№	Назва видання	Засновник (співзасновники)	Галузь науки, код (шифр) спеціальності або галузь знань	Дата включення (внесення змін), категорія
1.	Advances in Astronomy and Space Physics (Здобутки астрономії та фізики космосу)	Київський національний університет імені Тараса Шевченка, Головна астрономічна обсерваторія НАН України	фізико-математичні (астрономія, 01.04.08, 04.00.22, 05.07.12) спеціальності - 104	16.07.2018 «А»
2.	Agricultural Science and Practice (Сільськогосподарська наука і практика)	Національна академія аграрних наук України	біологічні сільськогосподарські спеціальності – 091, 201, 204, 211	02.07.2020 «А»
3.	Algebra and discrete mathematics	ДЗ «Луганський національний університет імені Тараса Шевченка»	фізико-математичні (01.01.06) спеціальності – 111	07.05.2019 «А»
4.	Biopolymers and cell	НАН України, Інститут молекулярної біології і генетики НАН України	біологічні технічні	02.07.2020 «А»

Fig. 1. List of the journals updated by Order of the Ministry of Education and Science of Ukraine with recent updates by order No. 1721, 10.12.2024

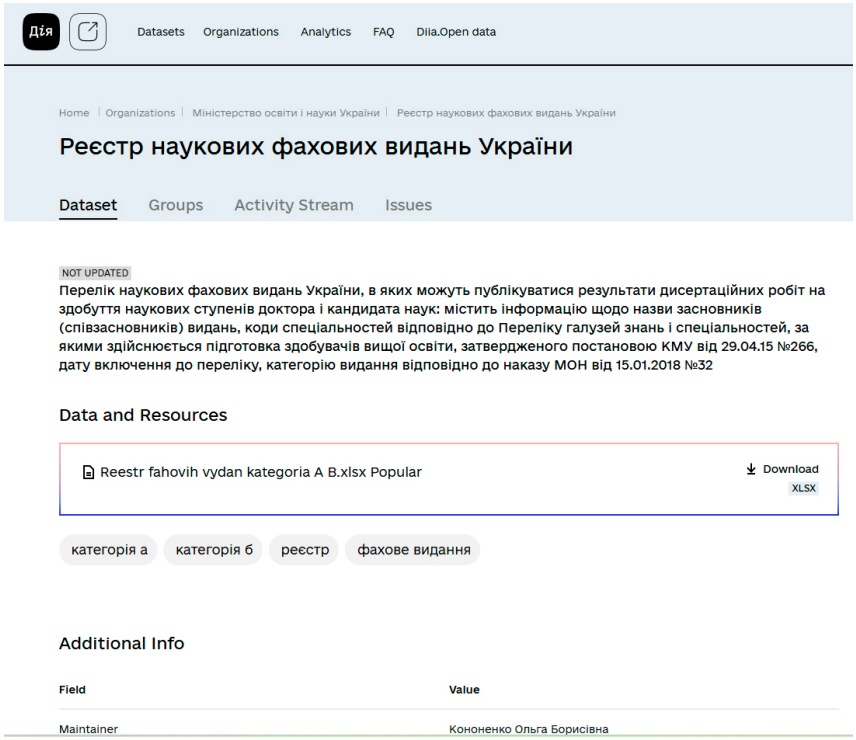


Fig. 2. General view of the Diia Open Data Portal

	A	B	C	D	E	F
1	НазваВидання	ЗасновникСпівзасновники	КодСпеціальності	ДатаВключення	Категорія	
2	Advanced Space Law	Науково-дослідний інститут публічного	081	2021-04-15	Б	
3	Advances in Astronomy and Space Physics (Здобутки астрономії та фізики космосу)	Київський національний університет імені Тараса Шевченка, Головна астрономічна обсерваторія НАН	104	2018-07-16	А	
4	Agricultural and Resource Economics: International Scientific E-Journal	ГО «Інститут східноєвропейських досліджень і дорадництва», Інститут економічних і соціальних наук	051, 071, 072, 073, 075, 076, 242, 281, 292	2021-02-09	А	
5	Agricultural Science and Practice (Сільськогосподарська наука і практика)	Національна академія аграрних наук України	091, 201, 204, 211	2020-07-02	А	
6	Algebra and discrete mathematics	ДЗ «Луганський національний університет імені Тараса Шевченка»	111	2019-05-07	А	
7	Art and Design	Київський національний університет технологій та дизайну	132, 182	2018-07-16	Б	
8	Art and Design	Київський національний університет технологій та дизайну	022, 023	2018-11-07	Б	
9	Art of medicine	ДВНЗ «Івано-Франківський національний медичний університет»	221, 222, 227, 228	2019-10-15	Б	
10	Biopolymers and cell	НАН України, Інститут молекулярної біології і генетики НАН України	091, 162	2020-07-02	А	
11	Biopolymers and cell	НАН України, Інститут молекулярної біології і генетики НАН України	102	2020-09-24	А	
12	Biosystems Diversity	Дніпровський національний університет імені Олеся Гончара	091, 101	2018-12-18	А	
13	Chemistry & Chemical	Національний університет «Львівська	102, 161	2019-07-11	А	
14	Computational Problems of Electrical Engineering	Національний університет «Львівська політехніка»	141, 171	2020-07-02	Б	
15	Computational Problems of Electrical Engineering	Національний університет «Львівська політехніка»	105, 275	2020-09-24	Б	
16	Computational Problems of Electrical Engineering	Національний університет «Львівська політехніка»	121, 122, 123, 151, 152	2020-11-26	Б	
17	Customs Scientific Journal	Університет митної справи та фінансів	051, 071, 072, 073, 075, 076, 081, 262,	2020-03-17	Б	

Фахові видання категорія А і Б

Fig. 3. Xlsx data related to journals located on Diia Open Data Portal

journal profiles contain detailed information, such as editorial board composition, thematic focus, and inclusion in international citation databases. However, the platform has notable limitations, including the absence of historical records indicating when a journal's classification was modified. Additionally, the validation of journal information relies on manual verification processes, which introduces the potential for inconsistencies and unverified data entries. Although the system enables publishers to create and manage journal profiles through email-based authentication, the manual nature of data updates raises concerns regarding accuracy and reliability. A list of the journals on IAS "Ukrainian Scientific Periodicals" is shown in Fig. 4 and the card of the Journal on IAS "Ukrainian Scientific Periodicals" is shown in Fig. 5.

Beyond these national registries, the Open Ukrainian Citation Index (OUCI) represents an alternative approach to journal classification by leveraging citation analysis. Developed by the SSTL, OUCI functions as both a search engine and a citation database, aggregating data from journals that participate in Crossref's Cited-by service and support the Initiative for Open Citations. The platform currently includes records for nearly 1,900 Ukrainian scientific journals across various disciplines. Unlike the Ministry's PDF list and the Diia.Open Data registry, OUCI employs ISSN identifiers and DOI prefixes to match journal metadata with publisher records, facilitating improved journal identification and citation tracking. However, despite these advantages, the platform has notable drawbacks. The addition of journal data remains a manual process, increasing the risk of errors in metadata entry. Furthermore, OUCI does not provide historical tracking of journal category changes, limiting its applicability for assessing the evolution of journal classification over time. OUCI journal's interface is shown in Fig. 6.

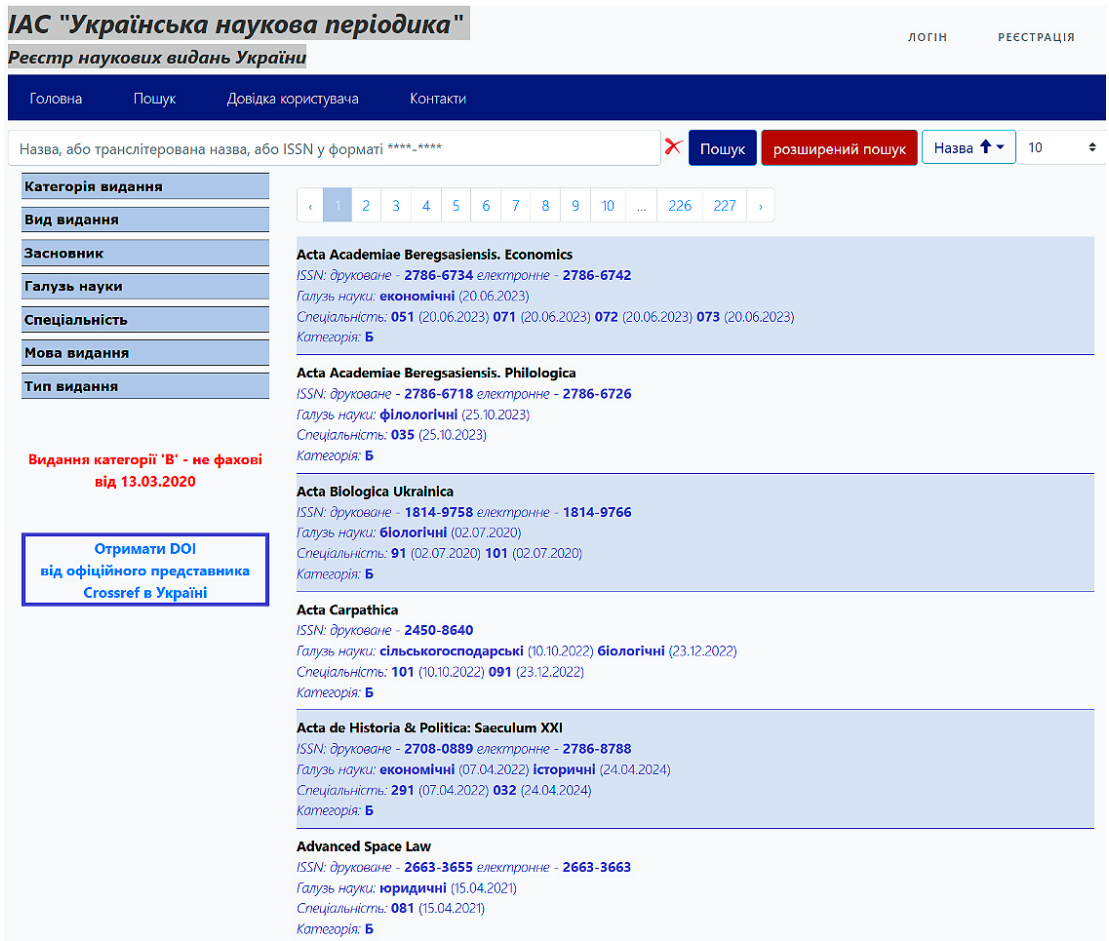
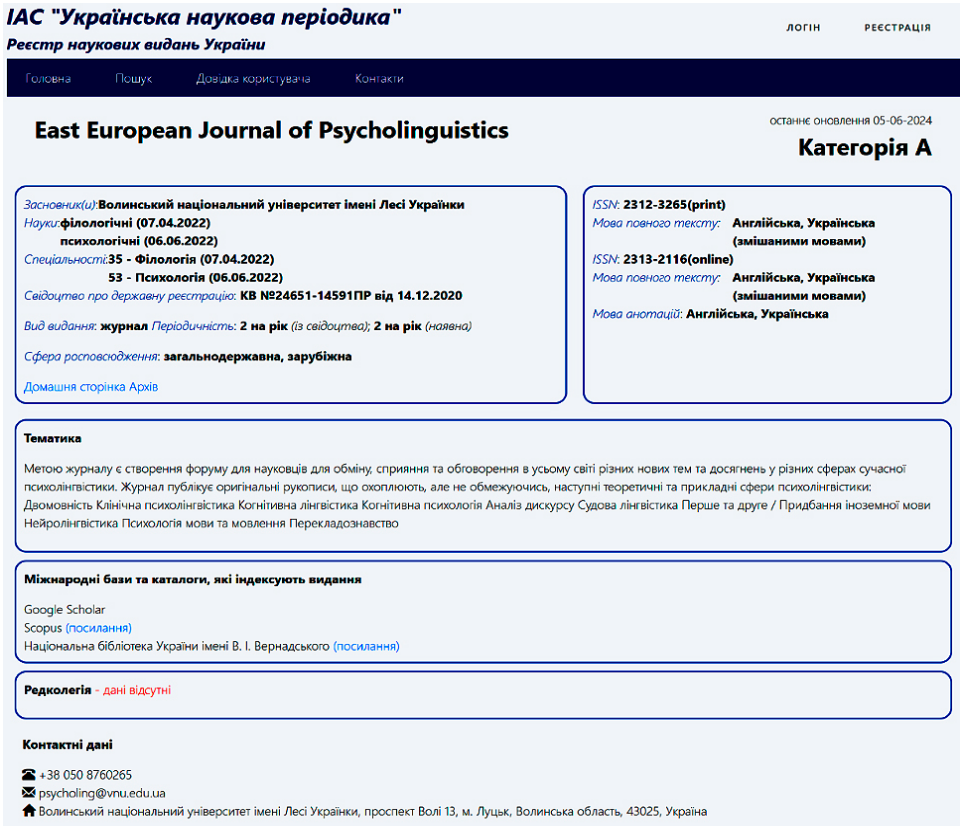


Fig. 4. List of Journals on IAS «Ukrainian Scientific Periodicals»



ІАС "Українська наукова періодика"

Реєстр наукових видань України

ЛОГІН РЕЄСТРАЦІЯ

Головна Пошук Довідка користувача Контакти

East European Journal of Psycholinguistics

останнє оновлення 05-06-2024

Категорія А

Засновник(и): **Волинський національний університет імені Лесі Українки**
Науки: **філологічні (07.04.2022)**
психологічні (06.06.2022)
Спеціальності: **35 - Філологія (07.04.2022)**
53 - Психологія (06.06.2022)
Свідоцтво про державну реєстрацію: **КВ №24651-14591ПР від 14.12.2020**

Вид видання: **журнал** *Періодичність:* **2 на рік** *(із свідоцтва)*; **2 на рік** *(наявна)*

Сфера розповсюдження: **загальнодержавна, зарубіжна**

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Мова анотацій: **Англійська, Українська**

Тематика

Метою журналу є створення форуму для науковців для обміну, сприяння та обговорення в усьому світі різних нових тем та досягнень у різних сферах сучасної психолінгвістики. Журнал публікує оригінальні рукописи, що охоплюють, але не обмежуючись, наступні теоретичні та прикладні сфери психолінгвістики: Двомовність Клінічна психолінгвістика Когнітивна лінгвістика Когнітивна психологія Аналіз дискурсу Судова лінгвістика Перше та друге / Придбання іноземної мови Нейролінгвістика Психологія мови та мовлення Перекладознавство

Міжнародні бази та каталоги, які індексують видання

Google Scholar
Scopus (посилання)
Національна бібліотека України імені В. І. Вернадського (посилання)

Редколегія - дані відсутні

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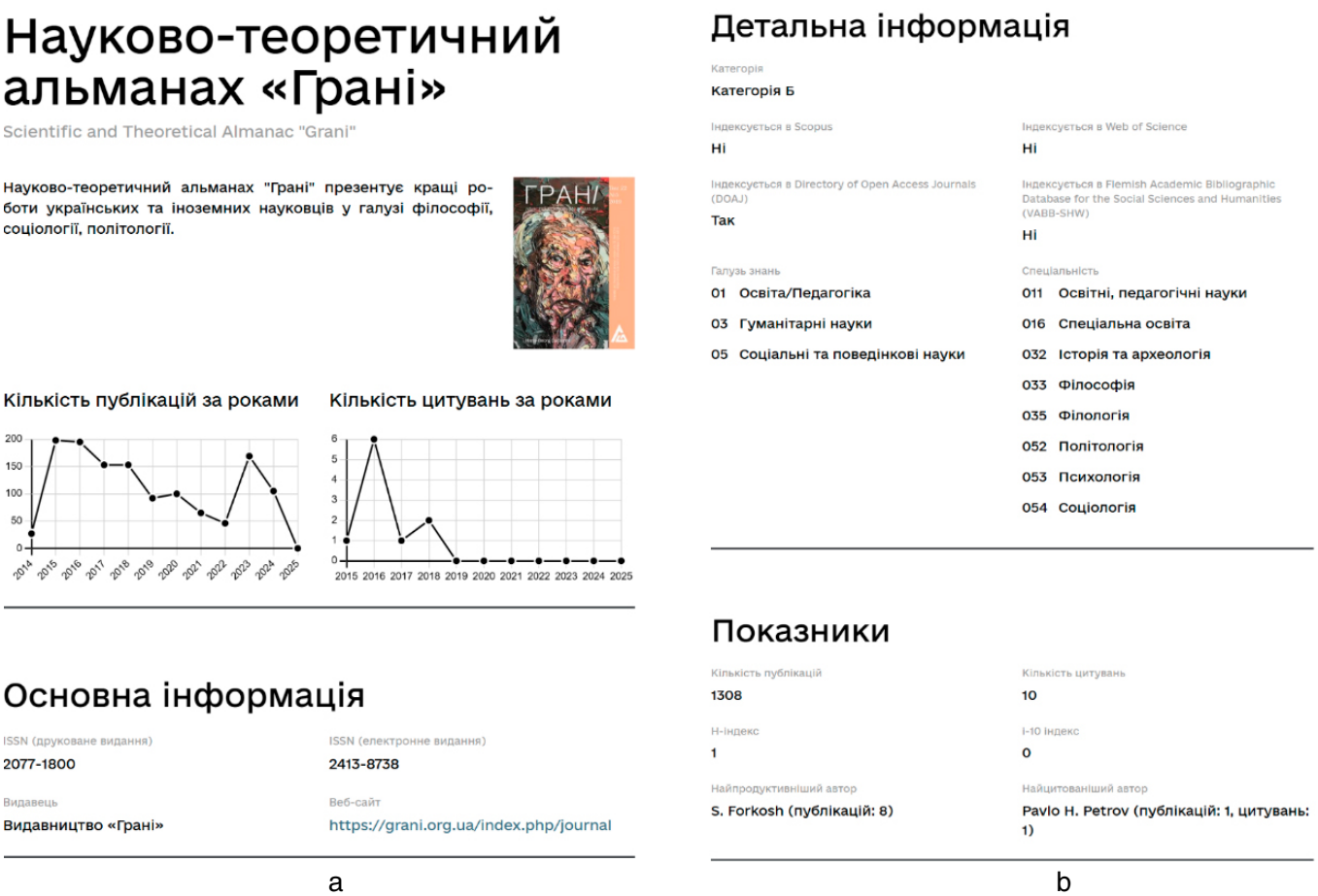
Fig. 5. Card of Journal on IAS «Ukrainian Scientific Periodicals»



Науково-теоретичний альманах «Грані»

Scientific and Theoretical Almanac "Grani"

Науково-теоретичний альманах "Грані" презентує кращі роботи українських та іноземних науковців у галузі філософії, соціології, політології.

Кількість публікацій за роками

Кількість цитувань за роками

Основна інформація

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Видавець Видавництво «Грані»

Веб-сайт https://grani.org.ua/index.php/journal

Детальна інформація

Категорія Категорія Б

Індексується в Scopus Ні

Індексується в Web of Science Ні

Індексується в Directory of Open Access Journals (DOAJ) Так

Індексується в Flemish Academic Bibliographic Database for the Social Sciences and Humanities (VABB-SHW) Ні

Галузь знань
01 Освіта/Педагогіка
03 Гуманітарні науки
05 Соціальні та поведінкові науки

Спеціальність
011 Освітні, педагогічні науки
016 Спеціальна освіта
032 Історія та археологія
033 Філософія
035 Філологія
052 Політологія
053 Психологія
054 Соціологія

Показники

Кількість публікацій 1308

Кількість цитувань 10

H-індекс 1

i-10 індекс 0

Найпродуктивніший автор S. Forkosh (публікацій: 8)

Найцитованіший автор Pavlo H. Petrov (публікацій: 1, цитувань: 1)

a b

Fig. 6. OUCI journal's interface: a — the first part, b — the second part

4.2. Using the information about the journals in NAUKA informational system

A final initiative relevant to journal classification in Ukraine is the National Electronic Scientific Information System (NAUKA). Unlike the previously discussed platforms, NAUKA does not function as a dedicated journal registry but instead serves as a comprehensive repository of Ukrainian scientific publications. The system is designed to integrate research-related data and provide advanced search and filtering capabilities for academic outputs. While NAUKA facilitates access to scientific literature, it does not include a structured classification of journals, making it unsuitable as a primary resource for journal assessment within the NAUKA scientist and publication modules. List of the publications and usage of journals on NAUKA portal is shown on Fig 7.

Existing journal databases, systems and other types of data in Ukraine analysis highlight a fundamental challenge: the lack of a unified, interoperable, and dynamically updated database for scientific periodicals. Each platform offers distinct advantages, but none provide a comprehensive solution. The Ministry's official list is authoritative but lacks digital accessibility and automated updates. The Diia Open Data dataset offers structured data but is static and disconnected from broader scientometric ecosystems. The IAS "Ukrainian Scientific Periodicals" system improves usability but suffers from manual validation issues. OUCI enhances citation-based journal visibility but does not track classification changes. NAUKA serves as a valuable publication repository but does not contribute directly to journal categorization. A future-oriented approach would involve the development of an automated system that cross-references journal records across registries, implements version control for historical tracking, and provides an API for seamless data integration

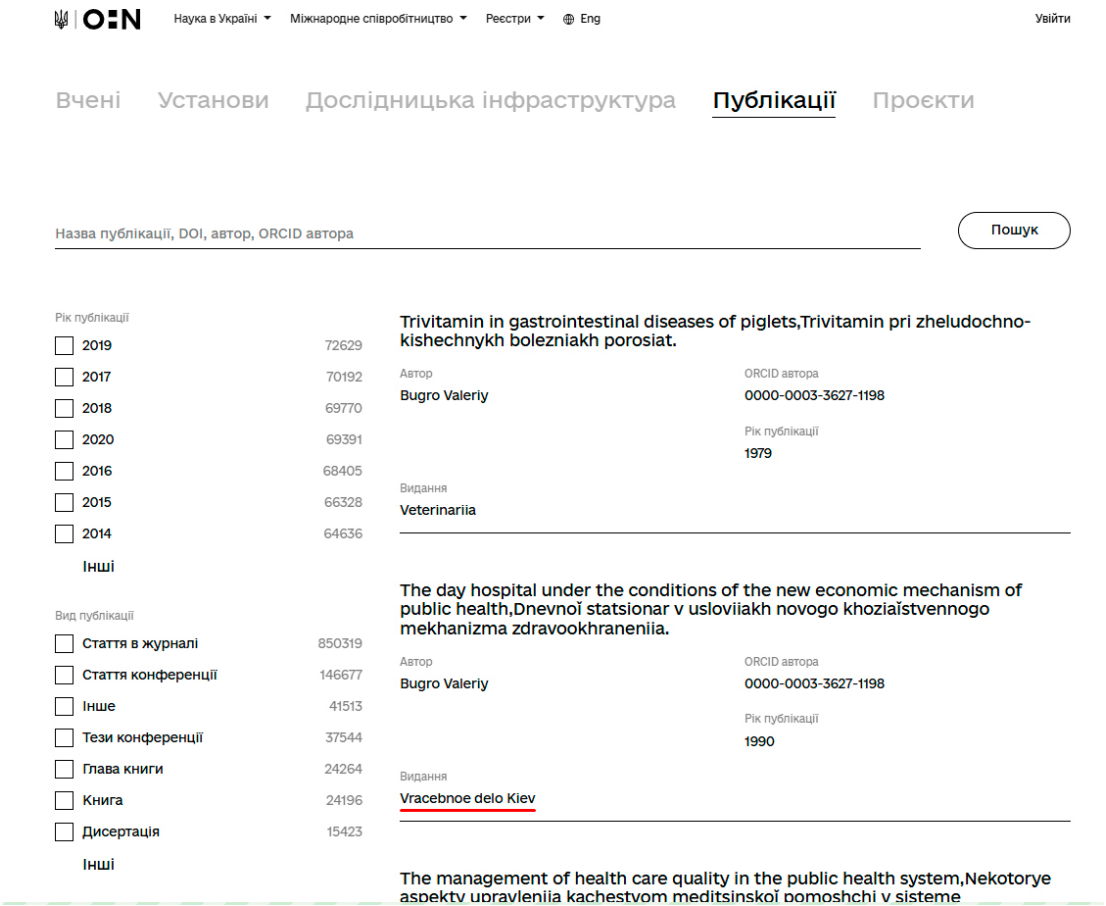

Fig. 7. List of the publications and usage of journals on NAUKA portal

with institutional and international databases. Such a system would significantly enhance the transparency, accessibility, and reliability of journal classification in Ukraine, addressing the current inefficiencies that hinder effective research evaluation and dissemination.

Comparative Analysis of Existing Scientific Journal Registries in Ukraine

To assess the limitations and advantages of the current systems managing scientific journal classification in Ukraine, a comparative analysis of key registries is necessary. The following table presents a structured comparison based on essential criteria such as **data structure, update mechanisms, searchability, validation processes, and interoperability**.

The analysis reveals that **none of the existing registries provide a fully comprehensive, authoritative, and dynamic system for journal classification and tracking in Ukraine**. The **Ministry's official list**, while being the primary legal reference, is **static and non-interactive**, making it difficult to use for research and evaluation. The **Diia Open Data registry** provides structured tabular data but lacks **real-time updates and validation mechanisms**. The **IAS "Ukrainian Scientific Periodicals" system** offers **better searchability and metadata tracking** but does not systematically record classification history. The **OUCI index**, while advanced in terms of **citation tracking and metadata cross-referencing**, does not function as an **official classification system** for Ukrainian scientific journals. Finally, the **NAUKA system**, despite its broad national research integration, **does not contain a dedicated journal registry module**.

These findings highlight the **urgent need for a unified, government-backed journal registry module within the NAUKA system**. Such a system must incorporate **real-time validation, historical tracking of classification changes, standardized identifiers, and automated integration with national and international databases**. Establishing this **centralized source of truth** will enhance **transparency, usability, and scientific integrity** in the Ukrainian academic publishing landscape.

4.3. Proposed approach to collect journal data

The establishment of a dedicated journal registry module within the National Electronic Scientific Information System (NAUKA) represents a crucial step toward creating a single authoritative source for scientific journal classification in Ukraine. The current landscape is characterized by fragmented, inconsistent, and manually maintained registries, each with its own limitations in terms of accessibility, verification, and update mechanisms. A centralized, government-managed database would resolve these issues by serving as the sole trusted reference point, ensuring data integrity, transparency, and real-time updates for all stakeholders, including researchers, institutions, and funding bodies.

The core advantage of such a module is that it would no longer rely on external datasets or require synchronization with disparate sources such as the Ministry's official PDF list, the Diia Open Data registry, or institutional platforms like the IAS "Ukrainian Scientific Periodicals" system. Instead, it would operate as an independent and primary source of validated journal data, providing a structured, searchable, and continuously updated registry of all recognized Ukrainian scientific periodicals. This would eliminate ambiguities in journal classification, duplication errors, and the delays inherent in manual data updates.

To ensure the reliability and credibility of the registry, it is essential to introduce a government-backed validation process. The module must include a role for authorized representatives from the Ministry of Education and Science of Ukraine, who will be responsible for verifying, updating, and approving all journal records before they are officially listed. The implementation of secure authentication mechanisms, such as electronic signature verification or BankID authorization, will enable only designated ministry officials to modify the registry, preventing unauthorized changes and ensuring data accuracy.

A key advantage of this centralized module is the elimination of redundant manual processes. The current approach, which requires re-

Table 1

Comparative Overview of Existing Scientific Journal Registries in Ukraine

Registry	Managing Institution	Data Format	Search & Filtering Capabilities	Update Mechanism	Validation & Oversight	Integration with Other Databases	Limitations
MoES Official List	MoES	PDF document	None	Manual updates by Ministry	No real-time validation; manually compiled	No direct integration	Static format, lacks searchability and identifiers, requires manual tracking of updates
Diia Open Data Portal	MoES	XLSX (Excel) file	Limited (manual filtering possible)	Periodic dataset publication	No validation; data inconsistencies possible	No real-time synchronization	No historical record tracking, requires manual downloads for updates
IAS "Ukrainian Scientific Periodicals"	Ukrainian Institute of Scientific and Technical Expertise and Information	Online database	Advanced search & filtering	Semi-automated, but manual validation	Basic validation by editorial teams	No automatic cross-referencing	Lacks version control, no tracking of classification history
OUCI	SSTL	Online database	Advanced search & citation tracking	Data sourced from Crossref	ISSN-based metadata verification	Integrated with Crossref & citation networks	No direct classification by Ministry, manual journal profile updates
NAUKA National Electronic System	SSTL	Online research database	Full-text search available	Not specialized for journals	No official journal registry function; but it's planned	Integrated with research outputs database	Lacks a structured journal registry module

searchers and institutions to cross-reference multiple independent registries, is inefficient and prone to discrepancies in journal classification. By consolidating all essential journal metadata into a single, government-controlled platform, the proposed system will enhance data accessibility, simplify compliance tracking, and provide a definitive reference for scientometric evaluation in Ukraine.

Furthermore, the implementation of searchable and filterable functionalities will significantly improve usability. Unlike existing PDF-based lists or static spreadsheets, the NAUKA journal registry module will offer:

- Advanced search and filtering by specialization, indexing status, category, and publisher.
- Version control with a detailed history of journal classification changes.
- An API for institutional integration, enabling universities and funding agencies to automatically retrieve verified journal data.

Incorporating these enhancements will solidify the NAUKA registry as the single source of truth for Ukrainian scientific journals. This approach not only aligns with international best practices in academic publishing management but also establishes a transparent and authoritative framework that can adapt to the evolving demands of research evaluation and funding distribution.

The implementation of a structured and transparent workflow within the proposed journal registry module of the National Electronic Scientific Information System (NAUKA) is essential to ensuring the accuracy, reliability, and timeliness of updates. The data processing mechanism must follow a standardized, multi-stage validation process, integrating both automated system functionalities and human oversight to maintain the integrity of the registry. Based on the outlined procedural framework, the following steps define the data processing and approval workflow within the system:

1. A Ministry of Education and Science of Ukraine official **inputs journal-related metadata**, including journal title, publisher details, ISSN identifier, specialization codes, indexing status, and other relevant attributes. This step ensures that all necessary information is systematically recorded and structured within the database.

2. Upon data submission, the system automatically **assigns a unique identifier** to each journal entry, preventing record duplication and ensuring consistency across different platforms. The implementation of persistent identifiers facilitates seamless long-term tracking of journals and their classification history.

3. The entered data pass an internal **validation process**, where **Ministry official review the journal's compliance** with established scientometric and regulatory criteria. At this stage, the category (A, B, or non-specialized) is assigned based on predefined classification rules, and additional metadata is verified to ensure accuracy.

4. Once the validation process is complete, the compiled registry update is forwarded to a designated official (e.g., Department Head or Ministerial Representative) for **final approval**. The approval process is conducted via electronic signature or BankID signature.

5. Upon official approval, the signed ministerial order is uploaded to the system, formally **confirming the inclusion, modification, or removal** of a journal in the registry. This step ensures that changes are documented, legally recognized, and permanently stored within the system's historical records.

6. Once the signed order is incorporated into the system, the **updated registry data becomes officially valid** and publicly accessible. Researchers, academic institutions, funding agencies, and other stakeholders can retrieve real-time, verified journal classification data for reference and analysis.

This workflow ensures that journal classification remains both transparent and authoritative. The structured approval mechanism minimizes the risk of inconsistencies, mitigates human error, and prevents unauthorized modifications to the database. Furthermore, the historical tracking of changes and use of digital authentication establish a secure and tamper-resistant environment, reinforcing the credibility and scientific integrity of Ukraine's academic publishing land-

scape. Proposed temporary mechanism of the journals' registration is shown in Fig. 8.

4.4. Ontological approach

Ontological tools provide a robust solution to these challenges by offering a structured framework to represent and manage journal data. An ontology for journals accounting could define entities such as journals, their subject categories, indexing statuses, and publication metrics, along with the relationships between them. This structured approach enables the standardization of journal classifications, integration of data from disparate sources, and enhanced search and analysis capabilities. Much like the ontological solution for linking different forms of an author's name, this method can unify journal-related information into a coherent system.

Drawing from the example of the "Polyhedron-Researcher" system (Tarasenko et al., 2020; Prykhodnyuk et al., 2023), developed by the National Center of Junior Academy of Sciences of Ukraine, a similar ontological approach can be applied to journals accounting. In addition to NAUKA system approaches designed to incorporate ontologies could be developed.

Looking ahead, this ontological framework could evolve to include more granular metadata, such as article-level analytics or predatory journal flags, enhancing its utility. Integration with machine learning could further enable predictive insights, such as identifying emerging research areas or assessing journal credibility. By leveraging ontological tools, journals accounting can be transformed into a more efficient, accurate, and accessible process, aligning with the broader goals of scientific automation and transparency outlined in this study.

5. CONCLUSION

This study revealed that the classification and management of scientific journals in Ukraine are marked by fragmentation, lack of uniform standards, and insufficient automation. Existing registries, such as the MoES official list, the Diia Open Data portal, the "Ukrainian Scientific Periodicals" system, and OUCI, offer specific strengths but fail to provide a comprehensive solution due to limited interoperability, absence of historical tracking, and reliance on manu-

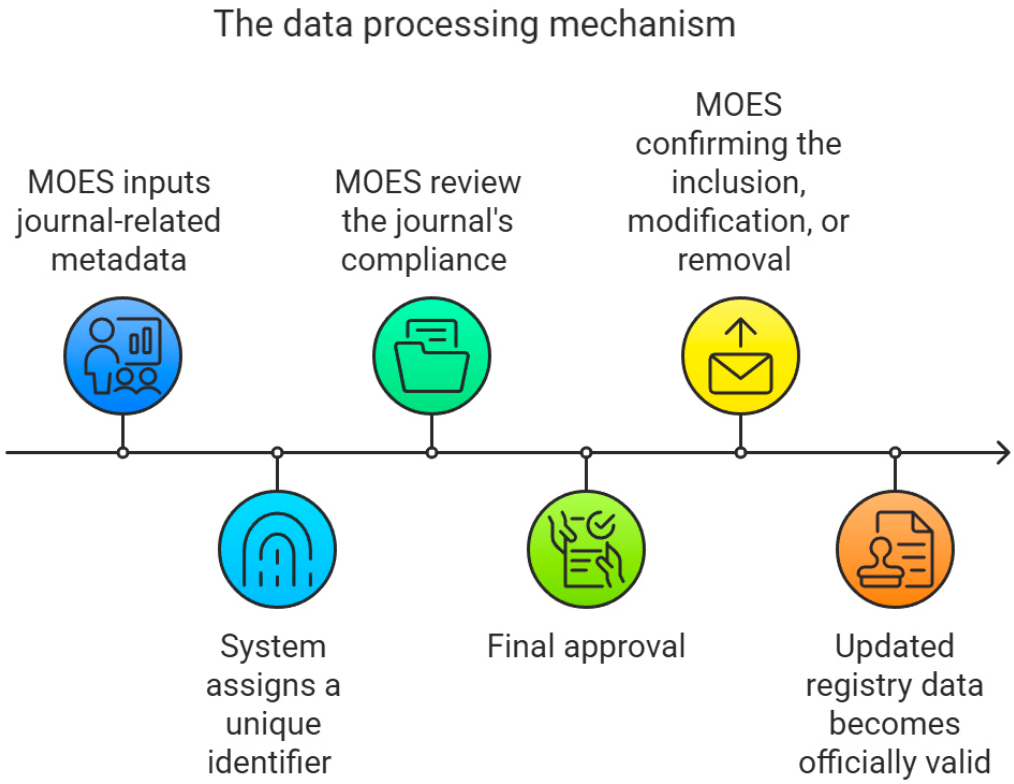

Fig. 8. Proposed temporary mechanism of the journals' registration

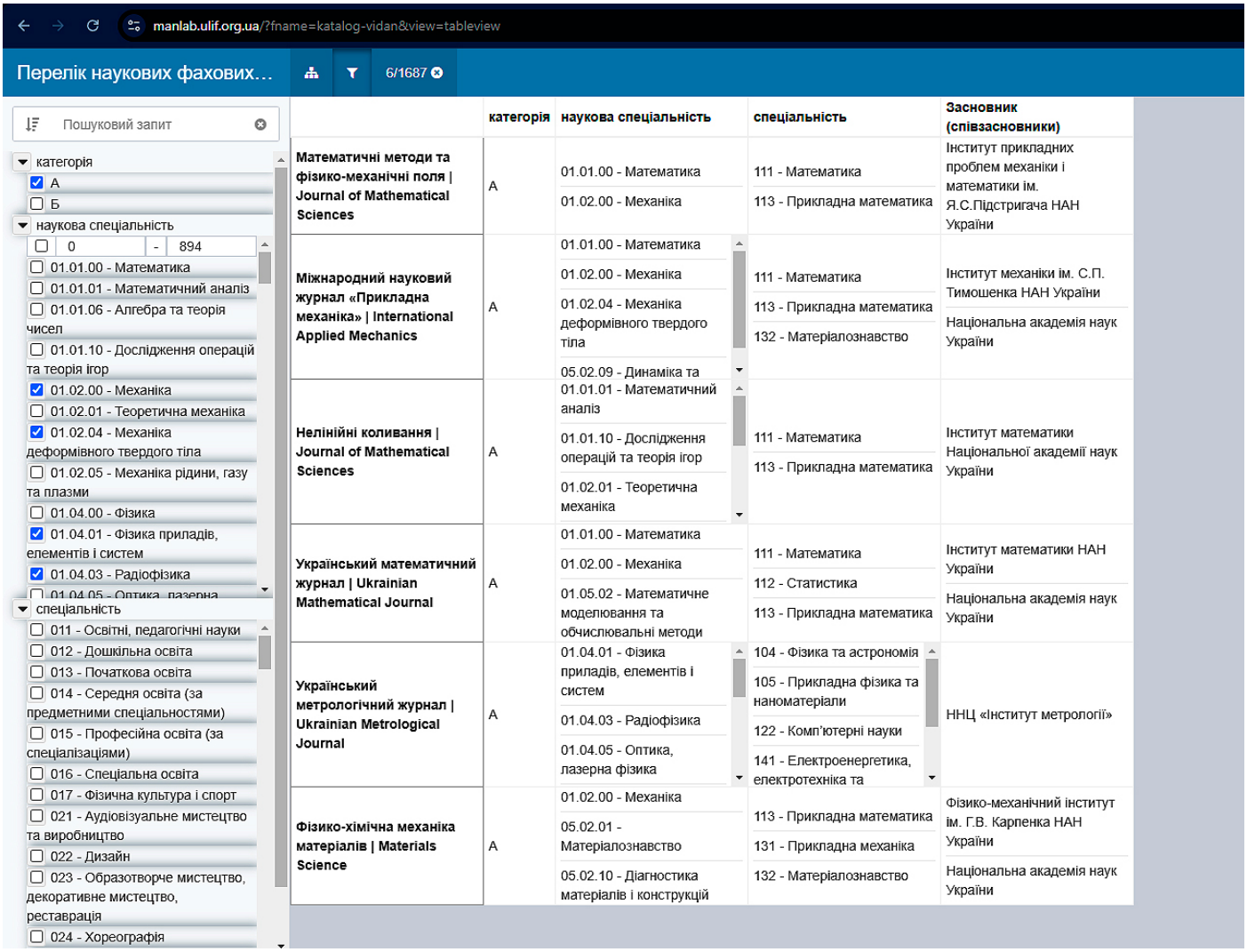

Fig. 9. Table view of the ontology of scientific journals of Ukraine

al updates. These shortcomings hinder journal evaluation, contribute to data duplication, and restrict integration with international scientometric platforms.

The development of a centralized journal registry within the NAUKA system is proposed as the single authoritative source for Ukrainian scientific periodicals. Key recommendations include implementing automated data validation and updates, adopting unique identifiers (e.g., ISSN), introducing version control for tracking classification history, and establishing ministerial oversight via electronic signature authentication. Additional enhancements involve advanced search functionalities, API integration with other databases, and standardized metadata to enhance transparency and accessibility.

Future research should focus on designing a detailed technical framework for the module, including specifications for APIs and real-time data synchronization protocols. A pilot phase involving key stakeholders—publishers, researchers, and MoES representatives — is essential to evaluate the system's effectiveness and adapt it to user needs. The implementation strategy entails a phased approach: starting with foundational infrastructure development and progressing to full integration with national and international platforms, thereby advancing open science and increasing the visibility of Ukrainian research output.

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ОБЛІК ФАХОВИХ ЖУРНАЛІВ В УКРАЇНІ: ПРОБЛЕМИ, РОЗВИТОК ІНФОРМАЦІЙНИХ СИСТЕМ ПРО ЖУРНАЛИ ТА ОНТОЛОГІЧНИЙ ПІДХІД

Анотація. *Класифікація та управління науковими журналами в Україні залишаються фрагментованими, оскільки різні реєстри працюють незалежно та не мають взаємодії між собою. У цьому дослідженні проаналізовано структурні недоліки наявних баз даних наукових журналів та запропоновано створення централізованого державного реєстру в межах* ***Національної електронної науково-інформаційної системи (NAUKA)****, який стане єдиним авторитетним джерелом класифікації журналів. У роботі визначено основні проблеми поточних реєстрів, зокрема* ***нестандартизовані формати даних, брак унікальних ідентифікаторів та історичного відстеження змін і залежність від ручних оновлень.***

На основі аналізу чинних механізмів класифікації в статті обґрунтовано необхідність створення ***уніфікованої системи з автоматизованою валідацією, контролем версій та наглядом із боку Міністерства через автентифікацію електронним підписом.*** *Запропонована система покликана підвищити* ***прозорість і доступність завдяки розширеним можливостям пошуку, автоматизованому оновленню категоризації та впровадженню структурованих метаданих,*** *таких як* ***ISSN, видавець, статус індексації та історія змін класифікації.*** *Ключовим елементом цієї моделі є* ***процедура міністерського затвердження****, що гарантує* ***юридичну чинність і достовірність оновлень у реєстрі.*** *Упровадження цієї системи* ***усуне надлишкові ручні процеси, запобігатиме розбіжностям у класифікації та сприятиме інтеграції з національними й міжнародними наукометричними базами.*** *У висновках окреслено дорожню карту розробки й інтеграції запропонованого модуля в NAUKA, а також його значення для забезпечення* ***прозорого та стандартизованого наукового публікаційного середовища в Україні.***

Ключові слова: *класифікація наукових журналів, база наукових даних, система NAUKA, стандартизація метаданих, автоматизація реєстрів журналів, міністерський нагляд.*

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