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SYSTEM OF THE SCIENTIFIC REGISTERS: RECOMMENDATION FOR DEVELOPMENT OF THE URIS

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Abstract. *The fragmentation of scientific data across disparate systems in Ukraine poses significant challenges to effective research management, strategic planning, and integration into the global scientific community. This article describes the Ukrainian Research Information System (URIS) and proposes the development of a comprehensive framework of interconnected registries aimed at streamlining the management of scientific activities. The registers should be developed in alignment with the Law of Ukraine "On Public Electronic Registries" (No. 1907-IX, dated 18.11.2021), providing URIS with data on research projects, results, institutions, publications, infrastructure, certifications, dissertations, intellectual property, researchers, and supporting documentation. By ensuring compliance with national legislation and incorporating international standards such as ORCID for researcher identification, ROR for organizations, and DOI for digital objects, the system enhances transparency, interoperability, and operational efficiency within Ukraine's scientific ecosystem.*

The literature review examines key areas including methodologies for persistent identifiers (PIDs), development of integrated scientific information systems (CRIS), standards for data quality and confidentiality in public registries, and the impact of interoperability on cross-border data exchange. The analysis draws on global best practices to highlight how standards like CERIF, SDMX, and OAI-PMH enable data harmonization. It also addresses key challenges: data heterogeneity, privacy concerns, and governance structures.

Methodologically, the study employs a multifaceted approach: a detailed review of Ukrainian legislation, conceptual modeling using Entity-Relationship Diagrams (ERD), and analysis of international CRIS implementations to design URIS as a legally compliant, automated system that minimizes administrative burdens through single data entry and validation.

The results provide recommendations for future URIS architecture, comprising nine core registries and an intellectual property integration module. For instance, the Registry of Projects manages funding and status details with unique identifiers; the Registry of Scientific Results documents outputs like technologies and datasets; the Registry of Institutions builds on EDRPOU with scientific specifics; and the Registry of Publications aggregates metadata from sources like Scopus, ensuring deduplication and verification. Interconnections enable seamless data flow, automated dossier generation, and public access to non-sensitive information, while security protocols protect confidentiality.

In conclusion, URIS represents a transformative step toward a unified, efficient scientific infrastructure in Ukraine, fostering evidence-based policymaking, reducing redundancy, and promoting international collaboration. Future enhancements could incorporate AI for advanced analytics, further elevating Ukraine's position in the global research landscape.

Keywords: *Scientific registries, URIS, research information system, data integration, interoperability, Ukraine, public electronic registries, ORCID, DOI, ROR.*

INTRODUCTION

In today's scientific environment, characterized by rapid growth in data volumes and increasing demands for transparency and accessibility, effective information management is becoming critically important. The development of digital technologies opens up new opportunities for automation, integration, and data exchange, but at the same time creates significant challenges related to standardization, compatibility, and quality and security assurance. The lack of unified approaches to identifying digital objects, integrating disparate information systems, and ensuring cross-border interaction hinders scientific progress and reduces the effectiveness of research.

THEORETICAL BACKGROUND

This literature review systematizes empirical data and analytical conclusions from four key areas that form the basis of modern scientific infrastructure. First, it examines methodologies and standards for persistent identifiers (PIDs), which are the foundation for reliable citation and linking of digital objects. Second, it analyzes approaches to the development of integrated scientific information systems (CRIS), similar to the Ukrainian URIS system, which serve as central hubs for the collection and management of scientific information. Third, it examines international standards for ensuring data quality and confidentiality in public electronic registries, which is particularly important in sensitive areas such as healthcare. Finally, the impact of international standards on cross-border data exchange, which is a key factor for global scientific cooperation, is assessed. The purpose of this review is to provide a comprehensive overview of the current state, challenges, and best practices in these interrelated areas.

Methodologies and Standards for Persistent Identifiers (PID). Persistent identifiers (PID) are the cornerstone of modern digital scientific infrastructure, providing stable and unambiguous references to digital objects such as datasets, publications, and software. An analysis of existing research shows that the leading technologies in this field are systems based on the Digital Object Identifier (DOI) and Handle System, which are most often cited as the main models in the context of publishing and scientific data (Paskin, 2009; Weigel et al., 2013). These systems are complemented by other important standards such as the Archival Resource Key (ARK), Uniform Resource Name (URN), and Open Researcher and Contributor ID (ORCID) for identifying researchers (Agosti et al., 2022).

Key topics that constantly arise in the literature are the problems of interoperability, management, scalability, and long-term sustainability of identification systems. Researchers propose various conceptual models to solve these problems. For example, to overcome the heterogeneity of different PID systems, framework solutions based on the semantic web and ontologies have been proposed, which facilitate the translation of metadata and ensure compatibility (Bellini et al., 2012). Other approaches focus on developing context-oriented frameworks that preserve links between different identifiers, which is especially important for complex scientific projects (Weigel et al., 2013).

Ensuring the long-term sustainability of PID goes beyond purely technical solutions and requires considerable attention to organizational and political aspects. Research highlights the critical importance of governance structures involving stakeholders and the development of clear policies to ensure financial sustainability and adaptation to technological change (Car et al., 2017). Technical solutions such as location-independent identifiers (Handle System) and abstract layers (Platform-Independent Model) are proposed as means to increase system reliability (Weigel et al., 2013; Car et al., 2017). The successful implementation of PIDs also depends on alignment with recognized standards and registration agencies such as the DOI Foundation, Crossref, and DataCite (Paskin, 2009; Hardisty et al., 2021). Although some fields, such as biodiversity, have already developed best practices at the community level, many other domains are still in the conceptual stage, indicating the need for further empirical research to assess the real effectiveness of different approaches (Agosti et al., 2022).

Development of Integrated Scientific Information Systems (CRIS). Integrated scien-

tific information systems (CRIS) are central elements of national and institutional scientific infrastructure, ensuring the collection, management, and analysis of research activities. The development of such systems, such as the Ukrainian URIS, is based on a set of international standards and methodologies aimed at ensuring interoperability and functionality. An analysis of existing research shows that the de facto standard for metadata and data models in CRIS is the Common European Research Information Format (CERIF), which is mentioned in most thematic studies as the basis for harmonizing data at the institutional and national levels (Bollini et al., 2016; Karaiskos et al., 2017).

Alongside CERIF, other standards are used for specific tasks. ORCID is widely used for the unique identification of researchers, which is critical for eliminating ambiguity and correctly linking data (Bollini et al., 2016; Karaiskos et al., 2017). Statistical Data and Metadata eXchange (SDMX) is used for statistical data exchange, while Dublin Core and Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) are used to collect metadata from various repositories (Sousa Pinto et al., 2014). For conceptual modeling of complex systems, some studies refer to models such as the DELOS Digital Library Reference Model (DELOS DLRM) and the Open Archival Information System Reference Model (OAIS RM) (Sadirmekova et al., 2021).

Architectural approaches to CRIS construction are mainly based on open source modular platforms (e.g., DSpace-CRIS), which promotes flexibility and interoperability, as well as on federated or service-oriented architectures for aggregating data from heterogeneous sources (Bollini et al., 2016; Scholze and Maier, 2012). To ensure data reliability and consistency, especially in complex ecosystems such as the Portuguese PTCRIS, formal software engineering methods and automated verification tools are used (Moreira et al., 2015).

Despite the existence of standards, developers face a number of challenges. The main problems include the heterogeneity of data formats, the technical difficulties of integrating legacy systems, and ensuring the quality of metadata (Leiva-Mederos et al., 2017; Moreira et al., 2015). Other significant obstacles are the lack of national researcher registries and the complexity of integration processes, as noted in the analysis of Ukrainian infrastructure (Kaliuzhna and Auhunas, 2022). Thus, the successful development of CRIS requires not only compliance with standards, but also local customization and the application of advanced methodologies to overcome technical and organizational barriers.

Data Quality and Confidentiality Standards in Public Electronic Registries. Public electronic registries, especially in the healthcare sector, play a key role in monitoring, research, and clinical decision-making. The effectiveness of these systems depends directly on three pillars: data quality, privacy protection, and interoperability. Existing research shows that although relevant international standards exist, their implementation and compliance remain uneven.

In the area of data quality, the World Health Organization (WHO) framework documents and International Standards for Clinical Trial Registries are the main benchmarks. However, their actual application varies significantly. For example, a study of clinical registries found that compliance with international standards ranged from 27% to 80%, indicating significant gaps in standardization and quality control (Venugopal and Saberwal, 2021). The transition to electronic systems has the potential to improve data quality and reduce bias, but this process is often hampered by a lack of resources and infrastructure, especially in low- and middle-income countries (Frøen et al., 2016).

Privacy protection is another critical area. Legal frameworks such as the General Data Protection Regulation (GDPR) in Europe and the Health Insurance Portability and Accountability Act (HIPAA) in the US set high standards. However, studies show that only a minority of countries have comprehensive privacy legislation, and the implementation of privacy by design principles, such as encryption and access control, is not universal practice (Myhre et al., 2016). Legal and organizational barriers related to privacy often become a major obstacle to

data sharing, even when the technical capabilities are in place (Valentić et al., 2017).

To ensure interoperability, approaches such as the Patient Registries Initiative (PARENT) Framework and International Patient Summary (IPS) standards are used to facilitate cross-border exchange of medical data (Oliveira et al., 2025). Technical solutions, such as metadata collection protocols (e.g., OAI-PMH), have proven effective in pilot projects of international federations (Plante et al., 2021). However, as in other areas, their widespread use is limited by legal diversity, the lack of harmonized standards, and uneven implementation, highlighting the need for a comprehensive approach that combines technical, legal, and organizational reforms.

Impact of Interoperability Standards on Cross-Border Data Exchange. Cross-border exchange of information in public registers is a prerequisite for effective international cooperation in areas such as law enforcement, justice, health care, and e-government. Empirical studies, mainly conducted in the European context, unanimously confirm that international data standards are a necessary but insufficient component for successful exchange. Their impact is largely mediated by three key factors: reliable and coordinated governance, legal harmonization, and organizational readiness.

Technical solutions, such as secure data exchange platforms (e.g., X-Road in Estonia and other countries or e-CODEX in the EU justice sector), are important catalysts that create the infrastructure for information transfer (Saputro et al., 2020; Carboni & Velicogna, 2012). The use of shared or reusable data models also helps to overcome semantic barriers and standardize information (Karunarathne et al., 2022; Van Compernolle et al., 2016). However, the effectiveness of these technological tools remains limited due to a number of persistent obstacles.

The most significant barriers consistently identified in studies are legal and organizational restrictions. Differences in national legislation, particularly in the area of personal data protection, create serious obstacles to the free flow of information (Santos, 2017; Otjacques et al., 2007). Even in cases where minimum standards are used to simplify exchange (e.g., under the Prüm Treaty on DNA data exchange), local discretion and differences in implementation can lead to suboptimal results (Santos, 2017).

Therefore, the success of cross-border interoperability depends on the existence of clear governance structures (Kubicek, 2008). This includes not only the development of technical standards, but also the assessment of readiness, the harmonization of the regulatory framework, and the creation of communities of practitioners to share experiences (Saputro et al., 2020; Van Compernolle et al., 2016). Thus, studies emphasize that in order to realize the full potential of international data standards, they must be implemented within a comprehensive ecosystem that takes into account technological, legal, organizational, and semantic aspects.

The URIS system and its current state of development. It is therefore advisable to develop approaches to improving the URIS system by identifying data sets and, accordingly, registries that would be appropriate to implement in the context of best international practices for interoperability and the use of unique identifiers.

MATERIALS AND METHODS

The development of URIS is grounded in a robust methodological approach that integrates multiple analytical perspectives. A thorough review of the Law of Ukraine «On Public Electronic Registries» ensured compliance with legal standards for data quality, security, and interoperability. Conceptual modeling of scientific entities, such as researchers, institutions, and projects, was conducted using Entity-Relationship Diagrams (ERD) to define a logical data structure. International practices, particularly the implementation of CRIS systems and persistent identifiers (PIDs) like ORCID, ROR, and DOI, were analyzed to align URIS with global standards. The synthesis of these analyses informed the design of a system that is legally compliant, practically viable, and minimizes administrative burdens through automated data collection and validation processes.

RESULTS AND DISCUSSION

The The Ukrainian Research Information System (URIS). The Ukrainian Research Information System (URIS) is envisioned as a comprehensive digital infrastructure that unifies the management of scientific activities in Ukraine. It would be relevant to provide it through a network of interconnected registries. This system addresses the fragmentation of scientific data by providing a centralized, interoperable platform that captures the full lifecycle of research activities, from ideation to outcomes. We propose to consider URIS to use nine core registries and a module for intellectual property integration (as data related to it is already located in another system), each designed to handle specific aspects of scientific data while ensuring seamless interaction across the system. The registries cover projects, scientific results, institutions, publications, infrastructure, certifications, dissertations, scientific councils, researchers, and supporting documentation. By leveraging the principle of single data entry in the registers and standardized identifiers using, URIS creates a cohesive ecosystem that supports evidence-based policymaking, enhances transparency, and fosters global integration.

The Registry of Projects serves as the backbone of URIS should provide a centralized repository for managing information on scientific, technological, and innovation projects funded by diverse sources, including state budgets, international grants, and private investments. Each project record includes a unique identifier, title (in Ukrainian and English), abstract, budget details, duration, scientific field, and status (e.g., active, completed, or suspended). The registry also captures data on grant programs and grantors, including program titles, competition details, and organizational information, with identifiers like EDRPOU for Ukrainian entities or ROR for international ones. Business processes for this registry include project submission, where lead institutions initiate records and submit applications to grant programs, and ongoing project registration, where project leaders manually enter data verified by participating institutions. Updates to project data require confirmation from relevant parties to ensure accuracy. The registry's integration with other URIS components allows it to link projects to their researchers, institutions, and outcomes, providing a holistic view of research activities.

The Registry of Scientific Results is recommended to be designed to systematically document tangible research outputs, such as new technologies, methodologies, software, materials, or datasets. Each result is assigned to a unique identifier and described in detail, including its scientific novelty, practical significance, and potential applications. The registry tracks the completion stage (e.g., prototype, ready for implementation), implementation status, and economic aspects like maintenance costs or commercialization potential. Business processes involve researchers or institutions initiating result records, linking them to supporting evidence like publications or patents, and verifying ownership through institutional confirmation. The registry also supports processes for updating implementation status and, if necessary, invalidating results with documented justification. By connecting results to projects, researchers, and institutions, this registry facilitates the evaluation of research productivity and supports technology transfer initiatives.

The Registry of Scientific Institutions should consolidate data on entities engaged in research, such as universities, research institutes, and scientific centers. Building on the Unified State Register of Enterprises and Organizations (EDRPOU), it incorporates scientific-specific details like research directions, attestation outcomes, and accredited educational programs. Each institutional record includes a unique URIS Org ID, EDRPOU code, ROR ID for international recognition, and information on subdivisions (e.g., departments, laboratories) and scientific councils. Business processes include automated profile creation using EDRPOU data, supplemented by manual entry of scientific details by institutional representatives (Fig.1). Periodic updates ensure data accuracy, with verification by the Ministry of Education and Science (MES). The registry supports institutional accreditation and attestation, linking to other URIS components to provide a comprehensive institutional profile.

The Registry of Publications should aggregate bibliographic metadata for scientific outputs, including articles, monographs, and con-

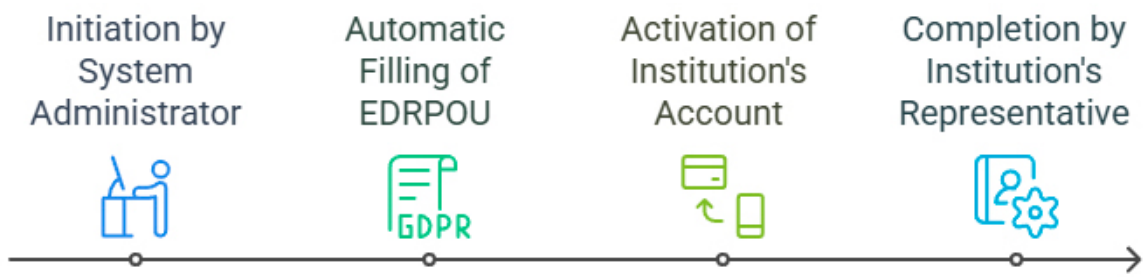

Fig. 1. Profile creation process

ference papers. Each record includes a URIS Pub ID, DOI, and other identifiers (e.g., Scopus ID, PubMed ID), along with details like title, abstract, keywords, and publication source. The registry supports open access policies by integrating with platforms like Unpaywall and CrossRef. Data is primarily collected through automated harvesting from international databases such as Scopus and Web of Science, supplemented by manual entry for non-indexed publications, such as local journals or monographs (Fig. 2). Deduplication processes use DOI or title/author similarity algorithms to ensure data integrity. Verification of manually entered publications is conducted by institutions or MES, ensuring reliability. The registry links publications to researchers, institutions, and projects, supporting the analysis of publication activity and scientific impact.

The Registry of Scientific Infrastructure should catalog critical research resources, including equipment, data repositories, and Centers for Collective Use of Scientific Equipment (CCUSE). Each record details the object's type, status, technical specifications, and access conditions, with links to owning institutions and responsible persons. For CCUSE, additional data includes founding details, equipment lists, and access regulations. Business processes involve manual data entry by institutions, with annual updates to maintain accuracy and verification by MES to ensure compliance with national standards (Fig. 3). The registry enhances resource accessibility, supports planning infrastructure development, and facilitates collective use by linking to projects and results that utilize these resources.

The Registry of Certifications should manage data on institutional and researcher evaluations, streamlining attestation processes. Each certification case includes a unique identifier, type (e.g., institutional or researcher attestation), object, and status, with automated dossiers

Fig. 2. Data Processing

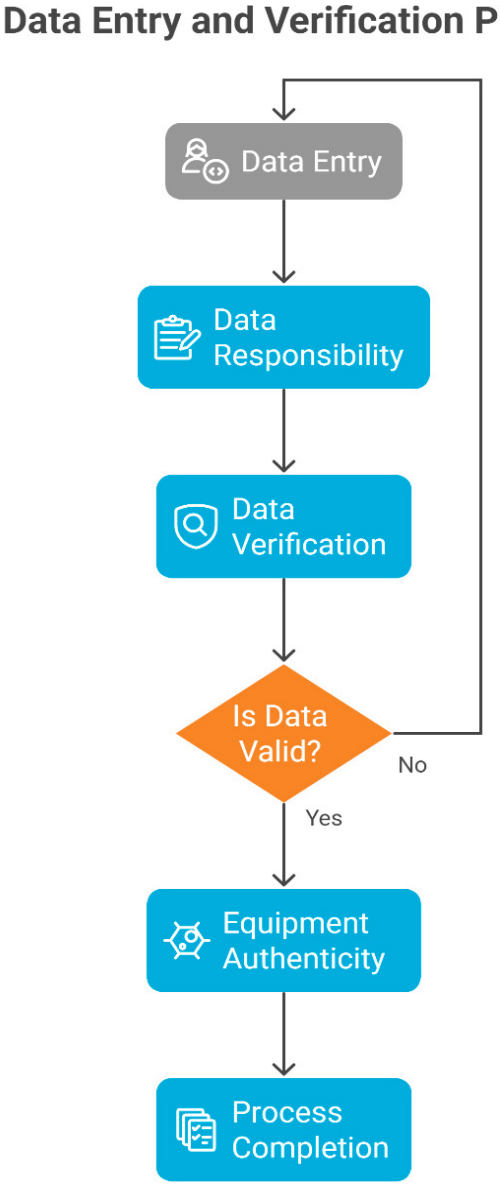

Fig. 3. The Registry of Scientific Infrastructure business process

generated from other URIS registries. Business processes include case initiation by MES, expert assignment from the Researcher Registry, and public disclosure of general results while protecting sensitive data. The registry supports transparency by linking to expert profiles and institutional records, ensuring accountability in evaluation processes.

The Registry of Dissertations should oversee the lifecycle of dissertation processes, from submission to defense and degree conferral. Each record includes the dissertation's title, abstract, specialty, and participant details (e.g., author, supervisor, opponents), linked to

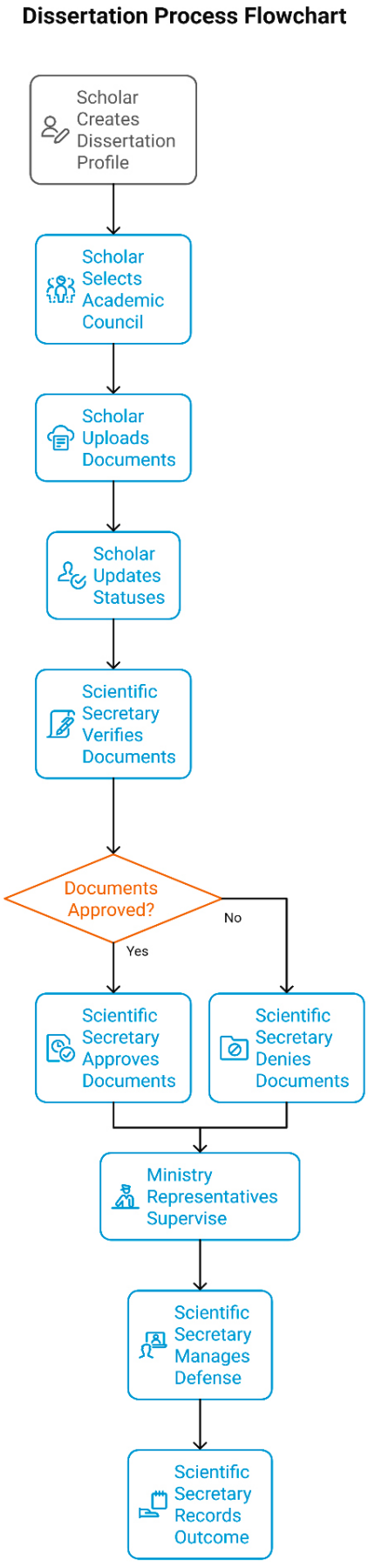

Fig. 4. The Registry of Scientific Counsils business process

the Researcher and Scientific Councils' registries. Business processes involve researchers initiating records, council secretaries verifying documents, and MES overseeing compliance. Public access is limited to key metadata, such as abstracts and defense outcomes, to balance transparency with privacy. The registry ensures traceability by linking dissertations to related publications and projects.

The Registry of Scientific Councils should track specialized councils authorized to confer degrees, documenting their composition, specialties, and operational status. Each council record includes a unique identifier, institution link, member details, and term of authority. Business processes include council creation initiated by institutions, with approval and verification by MES (Fig. 4). Updates to council membership or status are managed by council secretaries or MES, ensuring accuracy. The registry supports dissertation processes by providing a reliable record of authorized councils.

The Module for Intellectual Property Integration should connect URIS with the official Ukrainian Intellectual Property Registry (Ukrpatent), linking patents and protective documents to specific scientific results. This module operates by retrieving metadata from Ukrpatent via API, allowing researchers to link patents to their profiles and results within URIS. Business processes involve searching for and confirming documents, with manual updates for patent status changes (Fig. 5.). The module enhances the traceability of intellectual property, linking it to researchers, institutions, and projects.

The Registry of Researchers should be a people-centric component that assigns each scientist a unique URIS ID, integrated with ORCID for global identification. Profiles include professional details (e.g., degrees, affiliations), publication metrics, project involvement, and intellectual property records. Business processes include researcher-initiated profile creation with ORCID authentication, institutional verification of affiliations, and automated updates from other registries. This registry serves as a dynamic dashboard of individual research activity, supporting reporting and evaluation processes.

The Supporting Documentation Registries manage contracts, licenses, normative acts, certificates, and state-supported institutions. These registries centralize legal and administrative documents, linking them to relevant URIS entities. Business processes involve manual entry by authorized users, with verification to ensure accuracy. The registries ensure transpar-

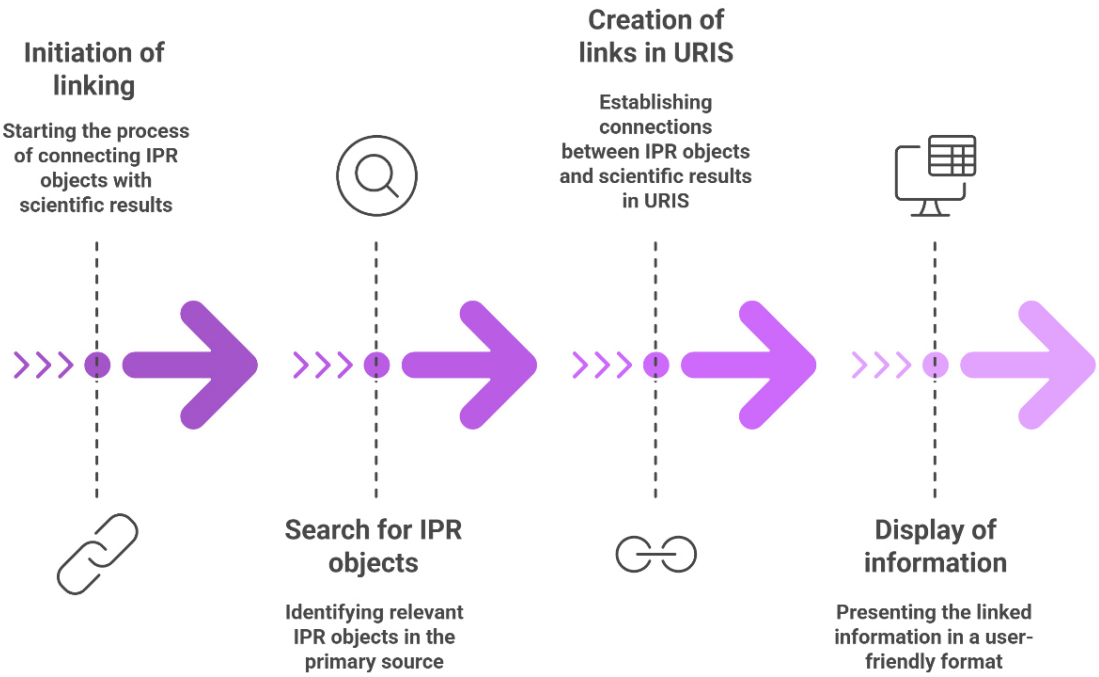

Fig. 5. Linking process of the Object of Intellectual Property with Research Results

ency in financial and legal aspects of research, supporting compliance with national regulations.

URIS's strength lies in its interconnected architecture, where data entered in one registry automatically populates related fields across others, reducing duplication and administrative burden. Unique identifiers (URIS IDs, ORCID, ROR, DOI) ensure traceability, while automated processes like data harvesting and dossier generation enhance efficiency. Public access to non-sensitive data, such as project summaries and publication metadata, fosters transparency, while restricted access to sensitive information ensures compliance with data protection regulations.

Compliance with the law on public registers. The URIS framework is designed to fully comply with the Law of Ukraine «On Public Electronic Registries» (No. 1907-IX, 18.11.2021), which establishes unified standards for the creation, maintenance, and interaction of public registries. The law emphasizes data quality, interoperability, security, and transparency, all of which are embedded in URIS's architecture. A unified technical and organizational framework facilitates seamless data exchange among URIS registries and with external state systems, such as the OU and Ukrpatent, via the national electronic interaction system («Trembita»).

Each URIS registry is governed by a normative act that defines its purpose, data fields, and operational processes, as mandated by the law. For example, the Registry of Projects uses unique identifiers for projects and grantors, ensuring traceability and linkage with other registries. The integration of international PIDs (ORCID, ROR, DOI) alongside national identifiers (EDRPOU) aligns URIS with both local and global standards. Data quality is maintained through automated harvesting from sources like Scopus and the Web of Science, supplemented by manual verification by institutions or MES. Security protocols, including user authentication and access controls, protect sensitive data, while audit mechanisms ensure compliance with legal requirements (Fig. 6.).

Interoperability is achieved through standardized data formats and protocols, enabling URIS to connect with external systems like Ope-

Fig. 6. Research register system

nAIRE and Ukrpatent. Business processes, such as project submission, result verification, and dissertation management, align with the law's stipulations on data entry, updating, and archiving. The designation of registry holders (e.g., MES) and technical administrators ensures clear governance, while coordination mechanisms maintain consistent standards across registries. Public access to non-sensitive data and restricted access to proprietary information balance transparency with privacy, adhering to the law's provisions.

CONCLUSIONS

We offered a transformative solution for The Ukrainian Research Information System (URIS) to the challenges of fragmented scientific data in Ukraine. By integrating nine registries and an intellectual property module, URIS will create a unified digital environment that captures the full spectrum of research activities. Its compliance with the Law of Ukraine «On Public Electronic Registries» will ensure legal robustness, while alignment with international standards enhances global integration. The system's emphasis on automation, data linkage, and transparency reduces administrative burdens and empowers stakeholders with actionable insights. URIS positions Ukraine's scientific ecosystem for enhanced competitiveness and visibility, with potential for future enhancements through artificial intelligence and expanded international collaboration.

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СИСТЕМА НАУКОВИХ РЕЄСТРІВ: РЕКОМЕНДАЦІЇ ЩОДО РОЗВИТКУ URIS

Анотація. *В Україні фрагментація наукових даних між окремими інформаційними ресурсами, що функціонують без єдиних стандартів і координації, створює значні перешкоди для ефективного управління науковими дослідженнями, стратегічного планування та інтеграції до глобальної наукової спільноти. У цій статті представлено пропозиції щодо розвитку Національної електронної науково-інформаційної системи (URIS), а саме — комплексну структуру взаємопов'язаних реєстрів, розроблену відповідно до Закону України «Про публічні електронні реєстри» (№ 1907-IX від 18.11.2021) й спрямовану на оптимізацію управління науковою діяльністю. Запропоновано, щоб система URIS інтегрувала дані про наукові проєкти, результати, установи, публікації, інфраструктуру, сертифікації, дисертації, інтелектуальну власність, дослідників та супровідну документацію. Забезпечуючи відповідність національному законодавству та впроваджуючи міжнародні стандарти, такі як ORCID для ідентифікації дослідників, ROR для організацій та DOI для цифрових об'єктів, система змогла б підвищити прозорість, інтероперабельність та операційну ефективність у науковій інфраструктурі України.*

Огляд літератури охоплює ключові сфери, включаючи методології ідентифікаторів (PID), розробку інтегрованих науково-інформаційних систем (CRIS), стандарти якості даних та конфіденційності в публічних реєстрах, а також вплив інтероперабельності на транскордонний обмін даними. На основі глобальних найкращих практик аналіз підкреслює важливість стандартів на кшталт CERIF, SDMX та OAI-PMH для гармонізації даних, водночас звертаючи увагу на виклики, такі як гетерогенність даних, проблеми конфіденційності та структури управління.

Методологічно дослідження застосовує багатогранний підхід: детальний аналіз українського законодавства, концептуальне моделювання за допомогою діаграм сутностей-зв'язків (ERD) та вивчення міжнародних упроваджень CRIS для проєктування URIS як юридично сумісної, автоматизованої системи, що мінімізує адміністративне навантаження через єдиний ввід даних та валідацію.

У результатах висвітлено пропозиції до архітектури URIS, яка включає дев'ять основних реєстрів та модуль інтеграції інтелектуальної власності. Зокрема, Реєстр проєктів керує деталями фінансування та статусами з унікальними ідентифікаторами; Реєстр наукових результатів документує вивід, як-от технології та набори даних; Реєстр наукових установ базується на ЄДРПОУ з науковими специфіками; Реєстр публікацій агрегує метадані з джерел на кшталт Scopus, забезпечуючи дедуплікацію та верифікацію. Взаємозв'язки уможливлюють безперервний потік даних, автоматизоване генерування досьє та публічний доступ до несенситивної інформації, тоді як протоколи безпеки захищають конфіденційність.

На завершення, система URIS є трансформаційним кроком до уніфікованої, ефективної наукової інфраструктури в Україні, зменшує дублювання, сприяє обґрунтованому прийняттю рішень та міжнародній співпраці. Майбутні вдосконалення можуть передбачати впровадження інструментів штучного інтелекту для розширеної аналітики, ще більше посилюючи позицію України в глобальному науковому просторі.

Ключові слова: *наукові реєстри, URIS, науково-інформаційна система, інтеграція даних, інтероперабельність, Україна, публічні електронні реєстри, ORCID, DOI, ROR.*

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