

Digital Repository of the University of Belgrade PHAIDRA and the eScience Portal

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ABSTRACT: The digital repository PHAIDRA, based on the Fedora system and created at the University of Vienna, has been serving as the technical foundation for depositing doctoral dissertations and other works produced at the University of Belgrade for over a decade. With the establishment of the eScience portal, the possibility of using the PHAIDRA infrastructure for the dissemination and presentation of contributions from scientific research organizations and researchers was opened. Consequently, another system (Phaidra Research) was initially launched for all institutions outside the University of Belgrade. A series of training sessions were organized for interested organizations looking to input their works into the PHAIDRA system for transmission to eScience. Finally, the opportunity was provided to process library materials through all available systems, including the repository, as one of the library services.

KEYWORDS: repositories, depositing works, researcher profiles, education, library services

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1 Introduction

The digital repository of the University of Belgrade, PHAIDRA, was established in 2011 as a technical support for the concept of open science, which was explicitly endorsed by the University of Belgrade at that time (*Берлинска декларација о отвореном приступу научном знању 2011*). In November of the same year, the University joined the signatory

countries of the Berlin Declaration on Open Access to Scientific Knowledge, becoming part of a group of over 300 universities worldwide.¹

The foundation of this first university repository was based on a system developed since 2006 at the University of Vienna as a modified version of the Fedora system. This modification was created to meet criteria for reliability, adaptability, and accessibility developed by the user community. (Хокнер and Будрони 2011) From the beginning of its use, the uniqueness and simplicity of the PHAIDRA system were emphasized, along with a structure that actively promotes open access policy. It provides the opportunity for self-archiving for all members of the university community, with clear copyright protection through the implementation of Creative Commons standards.

The PHAIDRA system allows the input of various types of objects (text, video, audio materials, images), grouping objects into collections, and obtaining a permanent link with a simple structure suitable for citation. The operation of the PHAIDRA system at the University of Belgrade, specifically at the University Library "Svetozar Marković," where the repository is maintained, involved not only providing a service but also implementing a series of educational and organizational activities.

The PHAIDRA system has been implemented at universities in Niš and Kragujevac, as well as in Podgorica, Sarajevo, and Tuzla. This led to a consortium, with universities in Austria and Italy (Graz, Linz, Padua),² designed to foster collaboration and exchange of experiences. All partners can independently develop the system and offer solutions to other consortium members based on their experiences (Stolić, Mazić, and Mazić 2012).

PHAIDRA has been and remains a project in development, creating a community in the Western Balkans and neighboring European countries, facilitating direct and regular communication and learning.

2 PHAIDRA - The First Decade at the University of Belgrade

Although part of the consortium (Phaidra.org), each university using the system was entirely independent regarding the usage of the repository and the formulation of local policies. From the beginning, the University

1. *Open Science at the University of Belgrade, 2023*. Today, the number of universities signatories to the Declaration is around 500. Accessed on October 24, 2023

2. *PHAIDRA community*. Accessed on October 25, 2023

of Belgrade allowed faculty and collaborators to be authorized PHAIDRA users, enabling them to self-archive their works in the system. Towards the end of 2011, several training sessions were held, involving librarians and, to a lesser extent, faculty members.

Repositories, as the foundation of the green open access model, are filled with content following satisfactory and controlled dynamics only if there is a mandatory deposit requirement (Harnad 2005). Since 2012, following the decisions of the University of Belgrade, all dissertations undergoing review and evaluation must have both a printed and an electronic version. The electronic versions are deposited in the PHAIDRA repository through the eTheses subsystem at the University Library.³ Electronic versions of defended dissertations at the University of Belgrade, along with a smaller number of retrospectively digitized dissertations, as obligatory copies, represent a continuous and stable inflow of publications in electronic form into the repository.

As a system equipped with a stable identifier, PHAIDRA is recognized as a useful tool for presenting other collections, such as those dedicated to the Europeana project (collection of oriental manuscripts and publications about Alexander the Great), thus maintaining a connection with the higher education purpose in the broadest sense. This purpose has been fulfilled on some faculties using PHAIDRA for depositing master's theses, thus solving the problem of publication storage.

During the first decade of using the PHAIDRA system, repository capacities were predominantly utilized for the secure deposition of documents. Other functionalities, such as data transfer to other systems, only included doctoral dissertations visible on the national, European, or global portal.⁴

3 The eScience Project

According to media reports, although the eScience portal officially became operational in May 2023 ("Pokrenut portal eNauka" 2023), organizational, technical, and other preparations had started considerably earlier. The University Library "Svetozar Marković" started its initial activities directly tied to this project intensively in the spring of 2022. The eScience initiative by the Office for IT and e-Government of the Government of the

3. eTheses. Accessed on October 26, 2023

4. Portals: Nardus, Dart Europe и Open Access Theses and Dissertations. Accessed on October 26, 2023

Republic of Serbia aimed to provide a more efficient, transparent, and comprehensive insight into the scientific contributions of research institutions and researchers. It strived to integrate some of the existing systems and enrich them with bibliometric data.

Unlike previous projects with similar goals, the eScience concept involved a unique form of decentralization, relying on other systems, primarily repositories at that time. Data would be extracted from these repositories using the OAI PMH protocol. Apart from this precondition, a key requirement for eScience was that records should be in the appropriate format (Dublin Core).

Starting from these assumptions, the University Library recognized the sustainability of the concept: if records are created at the places where they naturally originate, such as libraries and research organizations, often by specialized personnel like librarians, it ensures the long-term, comprehensive, and successful presentation of research results. This approach is not left solely to researchers nor focused on a single system, as was the case with the Register of Researchers of Serbia (RIS). However, the requirement for results to be presented, as a crucial precondition for evaluation and professional advancement, meant also encouraging researchers and research institutions to reevaluate the extent of their visibility and analyze where and how their results are seen.

What researchers identified as a requirement to fulfill, the University Library understood as a call to reassess, adapt, and mobilize its capacities. Systems identified immediately as resources or pillars capable of meeting the new needs of researchers were COBISS, eCRISS, and PHAIDRA. However, when it comes to the PHAIDRA repository, several shortcomings were noted in the new context, which needed to be overcome.

Approaching the PHAIDRA repository as a resource in service to eScience, at the same included the analysis of all aspects, identifying potential shortcomings, and formulating appropriate responses to each of them.

1. *Policy of depositing / concept of the repository.* The existing repository was intended for professors and associates of the University of Belgrade. In this sense, the question arose of how to meet the needs of other research institutions outside this university without disrupting the existing concept. The solution was found by establishing another repository, identical to the first, specifically designed for a diverse network of research institutions outside the University of Belgrade, named Phaidra ReSearch. In subsequent steps, with inquiries coming from state universities, the policy of the original repository was somewhat modified. In the "old"

PHAIDRA, in the end, besides the works of professors and associates of the UB faculties, works from other state universities, such as the faculties of the University of Arts in Belgrade or the State University in Novi Pazar, were also deposited.

2. *Education.* Potential users were offered the opportunity to use the PHAIDRA system for document deposition. The users had to attend a short, half-day training session, during which they became fully equipped for independent work in the system, with available expert technical support. Deposited documents would be grouped into corresponding collections that could be registered and harvested by the eScience platform. The entire process involved the collaboration of multiple library departments to ensure the seamless flow of the registration, record-keeping, and implementation of education processes, along with the necessary technical support.
3. *Library service.* For users who did not wish to use the system independently, a package of services was developed, involving the processing of delivered materials within the mentioned available library systems (COBISS, eCriss, and PHAIDRA). This aspect also required additional reorganization and engagement within the Library to ensure that objects were deposited into PHAIDRA in an appropriate manner.
4. *Technical adjustments.* Although the PHAIDRA system implements the Dublin Core metadata scheme and follows the specified requirements of the eScience system, possessing mandatory fields for describing digital objects, additional, specific requirements were needed for the records to be treated as valid in the context of eScience. Among them, the most prominent were various identifiers or document typologies, which practically had to be considered mandatory fields in this context. PHAIDRA repositories are adapted to the eScience system based on the OpenAIRE typology.⁵ Through the OAI-PMH protocol and following DOAJ recommendations,⁶ the implementation includes the transmission of researcher identifiers such as ORCID and CONOR, as well as corresponding DOI, ISSN, and COBISS identifiers related to the object itself.

The response to the eScience requirements involved multidimensional, team collaboration and simultaneous engagement of multiple departments within the Library, integrating organizational, technical, and educational components of work.

5. [Open Aire Guidelines. Publication Type \(M\)](#). Accessed on October 27, 2023

6. [DOAJ](#). Accessed on October 27, 2023

4 Education for using PHAIDRA

From April 2022 to September 2023, 25 collections were created, with 13 collections located in the newly established Phaidra ReSearch repository and 12 collections in the original PHAIDRA repository. The number of collections reported on the eScience portal, from which objects are downloaded for eScience, is slightly lower (around 20⁷), as some collections are not being filled with new objects.

A total of 22 collections were created as a result of training for representatives of research institutions, while 3 were established as part of the Library's services and material processing in library systems.

Although time-constrained, the training successfully covered:

- familiarization with the repository structure, types of objects, and recommended formats;
- walkthrough of the deposition process and understanding the mandatory description fields, both those required by the PHAIDRA system and those set as eScience requirements;
- formation of collections and explanation of the procedure for adding new objects to collections;
- object and collection editing procedures;
- copyright and licensing, "locking" objects.

Thanks to the simplicity of the PHAIDRA system and its focus on essential functionalities, representatives of research institutions, even those who are not librarians, could easily understand the archiving procedure and collection preparation. Additional assistance from the Library after the training included material (presentation), illustrating the depositing process, assistance in registering the repository on the eScience portal, and availability for consultations on practical questions.

7. Колекције у оквиру *Phaidra ReSearch*: Collections within Phaidra ReSearch: Institute of meat hygiene and technology, Institute for water resources "Jaroslav Černi," Institute of soil, Mining Institute, Institute of forestry, Faculty of law for business and judiciary, Faculty of economics and engineering management, Institute of artificial intelligence, Institute for medicinal plant research "Dr. Josif Pančić," Institute of mining and metallurgy Bor, Institute for Serbian culture Pristina – Leposavić, Institute for cardiovascular diseases Dedinje. Collections within PHAIDRA: INEP, Teacher education faculty, Faculty of economics, Institute "Mihajlo Pupin", State University of Novi Pazar, Faculty of fine arts, Faculty of dramatic arts.

5 Usage of the repository - status overview

Created collections in both repositories contain a different number of objects, depending on the needs and production of research institutions. The fact that in some collections new objects are not added, meaning that only objects entered during training remain, is more noticeable in collections belonging to the original PHAIDRA repository. In contrast, almost all collections of the Phaidra ReSearch repository are continuously supplemented. This circumstance indicates different initial states in institutions and different motivations for using the repositories. Faculties that are members of the University of Belgrade, as well as members of other state universities, generally have access to other systems for processing and presenting library material, such as COBISS, so they use the PHAIDRA system as additional infrastructure for open access deposition. In addition, some faculties already have their own repositories, so the training involved only familiarizing or reminding them of the operation of this system, which is continuously available to members of the University of Belgrade.

The most intensive use of the system in this way has come from those research institutions that are not part of the COBISS system and do not have the capacity to create their own repository. This group includes all users of the Phaidra ReSearch system and one user from PHAIDRA at the University of Belgrade.

Similarly, there is a difference between the two PHAIDRA systems regarding the individuals who attended the training and are depositing their work into the system: users of the Phaidra ReSearch system are mostly not librarians but other professionals, while in the use of PHAIDRA, almost all collections are formed by librarians. All this confirms the high level of development of library systems within the University of Belgrade and other state universities (work in the COBISS system, employed librarians), in contrast to other accredited research institutions that often do not have such capacities.

In several cases, familiarizing with the repository through training, not only as a specific system but also in its function of representing and promoting the results of research institutions, prompted institutions to consider initiating their own systems, engaging special human resources, or hiring librarians. In this way, PHAIDRA education has made a step beyond its purpose in a narrower sense, aiming to help institutions recognize and understand their needs and possibilities, and identify the best ways to improve

their work, through familiarization with the functions of repositories and the benefits they provide.

6 Conclusion

The development, reorganization, and utilization of the PHAIDRA repository for displaying results on the eScience portal involved the integration of multiple functions – technical development, educational aspects, and organizational components – along with the establishment of support systems. Together, these elements have brought a new and distinct perception and role for the repository. In its initial stages, the repository was focused on the permanent deposition of works by faculty and associates of the University of Belgrade, ensuring the reliable preservation of mandatory copies of doctoral dissertations and enhancing visibility in open access. However, the current role of PHAIDRA has evolved to become an integral part of library services, addressing specific requests from library users.

PHAIDRA is now recognized as a user-friendly, straightforward, and optimal tool for presenting research outcomes on the eScience portal, requiring minimal investment from research institutions. This evolution hasn't diminished its original purpose, which includes archiving and long-term preservation of electronic materials while respecting copyright and offering the possibility to transfer content to other systems. The expansion of PHAIDRA's role and perception has been concurrent with the broadening of its user base, extending beyond the University of Belgrade to encompass all interested research institutions. With two identical systems in place, the initial editorial concept has remained consistent. The ongoing experience with PHAIDRA's involvement in eScience demonstrates an adaptive approach, responsiveness to changes, and a commitment to meeting the evolving needs and interests of users.

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