HOW TO BE FAIR? OPEN PUBLICATIONS AND RESEARCH DATA AT THE LUBLIN UNIVERSITY OF TECHNOLOGY

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Abstract: The policy of open access to scientific publications at the Lublin University of Technology gave rise to the issue of sharing research data, which emerged to be a challenge for both research workers and librarians. Promoting awareness in the academic community of how the value and significance of their data increases and when others can make use of it is a novel and challenging task. The objective of this article is to present the activities undertaken for this purpose by the librarians of the Lublin University of Technology. These activities include introducing the Open Access Policy, creating a research data management strategy, and appointing two teams: one with the aim of supporting the University's Project Office, and the second to create an institutional repository of research data. These actions contribute to the understanding of the value of sharing research results and how to be FAIR when doing so.

Keywords: activities of librarians, ethics in scientific research, open science, Open Access, researcher, research data management

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1. Introduction

Reliability in the field of scientific research is a topic that regularly reappears in academic discussions, in the press, and in scientific articles. In recent years, the topic of genuine research and scientific honesty has returned due to the activities of grant funders (including the European Commission, and, in Poland, the National Science Centre). These entities demand that researchers should have a thorough plan for the management of research data for which funds are allocated, and that researchers should openly present the results of their research activities to the academic community and other potential stakeholders.

Many documents remind us of the moral principles in scientific research and the publication of results. In 1946, the World Federation of Scientific Workers

was established, with the aim of bringing together prominent scientists and promoting the ideas of an ethical approach to scientific research. They postulated the adoption of the "Code of a Researcher" to "encourage researchers to take an active part in public life and make them aware of their own responsibility" [1].

The term "code" has been met by the research community with both understanding and criticism. Scientists have recognized it as incongruous and referring to the statutory law, and not to ethics in the philosophical sense referring to morality, honesty, and the obligation to follow the commitments assumed; for example, those included in the doctoral oath. Ultimately, a document that would describe good practices and actions eliminating abuses has not been created [2]. Nevertheless, the discussion that has been ongoing since the 1960s in the Polish scientific community proves the need to codify the rules of professional ethics that apply to the researcher. In the early 1990s, Gibiński's study, *Dobre obyczaje w nauce. Zbiór zasad i wytycznych (…) (Good Practices in Science. A Set of Principles and Guidelines),* was published. And in 2012, the Scientific Society of the Polish Academy of Sciences (PAN) published *Kodeks etyki pracownika naukowego (Code of Ethics for a Researcher)*. Moroz-Grzelak quotes Kotarbiński, a notable philosopher and ethicist, as believing that the codification of the rules of professional ethics is a result of an increase in unwanted attitudes and serves as a form of educational influence [3]. According to the philosopher, the reason for such a need lies in the changes that professions are undergoing. Undoubtedly, the profession of an academic librarian is one of the spheres in which new directions of development are clearly visible, resulting primarily from the demands of the academic community, and one of these needs is to support the process of managing research data.

2. Sharing Research Data in Compliance with the FAIR Guiding Principles

As research is becoming increasingly intense and researchers face new challenges in managing and sharing research data, libraries have started to offer a range of data support services, including tutorials and training sessions [4]. The first conferences devoted to opening research data in Poland were held as early as in 2012 [5], and we have been actively dealing with issues related to data collection, archiving, and sharing since 2019.

In that year, the National Science Centre introduced six items related to the plan for research data management into project applications. The essence of the plan is not only to set up the research process so that it should run in accordance with the project assumptions, reducing the risk of failure (error), but also to prepare data obtained through research in such a way that it can be reused, or the process itself can be repeated.

According to the assumptions of the National Science Centre and the European Commission, the data should be prepared by the researcher in harmony with certain standards. In 2016, the GO FAIR Association published the *FAIR*

Guiding Principles for Scientific Data Management and Stewardship. This guide describes the principles for sharing research data in compliance with the ethics of the scientist. The intention of the authors was to clearly define the guidelines in order to help researchers describe data in a machine-readable way, making the data FAIR: Findable, Accessible, Interoperable (co-creating the system as a whole), and Reusable. Due to the rapid development of technology, and, at the same time, the increasing amount and complexity of information, and the speed with which it is generated, it is necessary to rely on computational support when working with data. Data interoperability and reuse have become possible thanks to the so-called M4M (Metadata for Machines). It should be noted that metadata must meet the conditions for machine reading; certain standards that have been already developed for various fields help to ensure appropriate preparation of data.

Interoperability and reuse of data would not be possible without the preparatory work of the scientist and the librarian. The former is responsible for the professional preparation of data in terms of content in his or her field, while the latter supports the scientist by explaining the rules for documenting, depositing/archiving and disseminating research data. According to the research conducted by Virginia Tech in 2016, libraries must constantly adapt to the changing needs of users. Thus, it is necessary to provide services related to research data management, education in this area, and appropriate technological infrastructure, including strong metadata standards and automated processes [6].

Unfortunately, the majority of researchers do not take full advantage of the possibilities offered by libraries. It is is only some of them that go to the library, although librarians are indicated in the Data Management Plan as individuals who can help in the processes related to the depositing and archiving of data. It should be clarified that what is meant here is the research data obtained during a research project the source of funding of which is, for example, the National Science Centre. More and more publishing houses are starting to obtain research data, and such data becomes the basis for the publication of an article in a journal. At the reviewer's request, editorial offices can make the data available for verification of research correctness, but they often become an incentive for a new type of publication at the request of the thematic editor. In this way, the so-called Data Journals are becoming more and more popular; and they bring attention directly to the research data itself, instead of data analysis.

3. From Open Access to Open Data at the Lublin University of Technology

Participation of librarians in research data activities at the Scientific and Technical Information Centre (CINT) began in 2019. It resulted from the policy of open access to scientific publications that had been practiced for many years, beginning with the adaptation of the existing database of the University employees' publications to tasks related to the parameterization and reporting of scientific activity. In 2011, the database was enriched with bibliometric indicators

and auxiliary tools improving citation analysis and the visibility of achievements (connecting the database with the Web of Science platform via API). Another important step was to connect the database with the ResearcherID application (now Publons), which makes it possible to identify the author, create a public profile, and manage the list of scientific achievements. The use of the standard RIS (Research Information Systems) format has made it possible to exchange data and export it to other reference programs [7]. The following years brought new functionalities (for example, the introduction of obligatory international researcher ID – ORCID) within the PL Employees Publication Database, adapting it to the current requirements of both the University and the Ministry of Science and Education.

Concurrently, the Centre for Publishing and the Digital Library (now the Publishing House of the Lublin University of Technology) implemented the so-called publication dualism. With the publication of a printed book, its electronic version appears in the Digital Library of the Lublin University of Technology. Scientific monographs, textbooks and books included in thematic collections are published under a free CC-BY-SA license. Since 2010, doctoral dissertations have been compiled into another collection and they are also available under free licenses (in accordance with the *Rector's Regulation R-10/2010 on the collection, preparation and sharing by the Library of the Lublin University of Technology of doctoral dissertations defended at the Lublin University of Technology)*. It should be noted that the metadata in the PL Digital Library contains a hyperlink that links the PL Employees Publication Database, the library catalogue, and the NUKAT Central Catalogue. Thanks to this practice, the publication is disseminated online and increases its reach, becoming easy to search and widely available to potential users [8]. These activities have had an effect on the academic community. They have increased the awareness of the benefits of disseminating scientific achievements using the Open Access formula, which enables free and immediate access to the content.

The second natural stage that followed was the implementation of the Open Journal Systems, an online content management system which is an alternative to the traditional publishing model. It makes it possible to manage the publishing process of journals, from submission of the text by the author, through reviews, to publication on the website. The advantages of this system include information on indicators such as IF (Impact Factor), affiliation to specialist databases for individual journals on the platform, direct data export to DOAJ (Directory of Open Access Journals), a plug-in enabling indexing in Google Scholar or Index Copernicus, a subscription management option, and RSS notification plug-in [9]. Journal articles are also published under free CC-BY-SA and CC-BY licenses.

The European Commission has contributed substantially to the OA movement, *inter alia*, through the Horizon 2020 Framework Program, to increased availability of research data in academic environments of the Member States, recognizing it as "a driving force of innovation, growth, and transparent management"

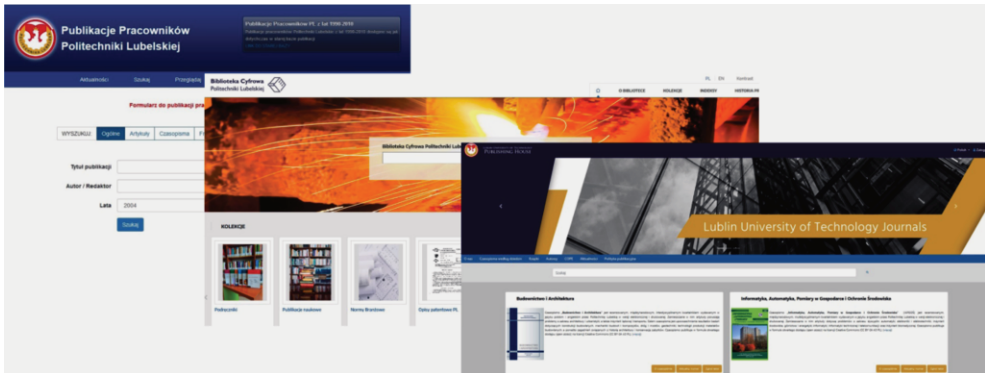

Figure 1. PL Employee Publication Database, PL Digital Library, LUT Publishing House Platform

[10]. The willingness to enable faster progress, reduce research efforts and expenditure, ensure collaboration and improve its quality goes hand in hand with the research transparency, accountability, and scientific honesty. Therefore, it becomes a part of the researcher's "code" of ethics. National universities and research institutes have started publishing the so-called open access policies which define their path towards opening up their publications and research data.

In November 2020, a similar document, demonstrating the willingness to join the Open Science movement, was introduced by the Lublin University of Technology. The opening part of the document, the preamble, says that:

> "Transparency and open access to knowledge are an important direction of the University development. They make it possible to increase the availability, usage, and dissemination of the academic achievements of the University, as well as broad cooperation and exchange of information, also with institutions operating outside the field of science. They enable popularization of scientific achievements among citizens, including non-scientists, by including them in the research process" [11]

The document consists of three parts: the first deals with activities supporting open access to publications, the second with open access to data, and the third explains the role of the coordinator of these activities. This policy is one of the elements of the research data management strategy at the University.

4. Research Data Management Strategy at the Lublin University of Technology

The Open Access Policy is a document that describes both what the Scientific and Technical Information Centre (Library, PL Publishing House, Centre for Bibliometric Analysis) has been implementing for many years, and what it intends to do in the near future. Its authors see this document as a

starting point, not only for opening publications and data, but also for opening up to cooperation within the University and outside.

In 2020, the newly appointed University authorities performed a restructuring of the faculties and university-wide units, and established the Project Office and teams responsible for various aspects of works supporting research processes. The Project Office has become a place of comprehensive assistance for scholars applying for research funds. Its qualified team has established close cooperation with librarians, who have been entrusted with the task of supporting research workers in the preparation of Research Data Management Plans (PZD), in choosing a repository, selecting, and depositing data.

It should be noted that CINT employees were appointed and trained to support research workers and Project Office employees as early as at the first mentions of the establishment of PZD by research funding units. The team has defined procedures for the PZD that ensure clear and efficient work on the project, make it possible to consult the plan individually, correct it jointly, or consult on issues related to the selection of the license and the repository. In June, 16 plans submitted as part of the Miniatura, Opus, and Preludium projects were analyzed.

One of the elements of the data management strategy is the organization of training sessions by the CINT. These are mainly individual, "on-demand" training sessions that take place before an employee starts working on his or her project and during its preparation. There are also plans for compulsory classes, including the preparation of data management plans as part of the Doctoral School. The courses will refer to classes in the ethics of scientific publishing already conducted at the School, which cover topics related to the correct quoting of sources, the problem of intellectual property theft (plagiarism), free licenses and OA.

Employees may also go to the CINT website, where, in the *Open Science* tab prepared by the librarian, they can get help in writing a PZD, and in other aspects of research work. The website contains the most important information on Open Access, copyright and free licenses, research data management, as well as the policy of open access, and the contact details of the representative for open access in Poland.

As part of a long-term strategy, the CINT has established an institutional repository team. Its members include an attorney for open access issues, an IT specialist, and two librarians; a research data specialist from the Centre for Bibliometric Analysis and a specialist from the Resources Department, who is responsible for the correctness of descriptive and structural metadata. The task of the team members is to help researchers describe and deposit data in the selected repository.

Currently, the Lublin University of Technology does not have its own research data repository. Therefore, it has concluded an agreement with the Interdisciplinary Centre for Mathematical and Computational Modelling (ICM) at the University of Warsaw for depositing data in the RepOD Open General Repository, in the collection of the Lublin University of Technology, in accordance

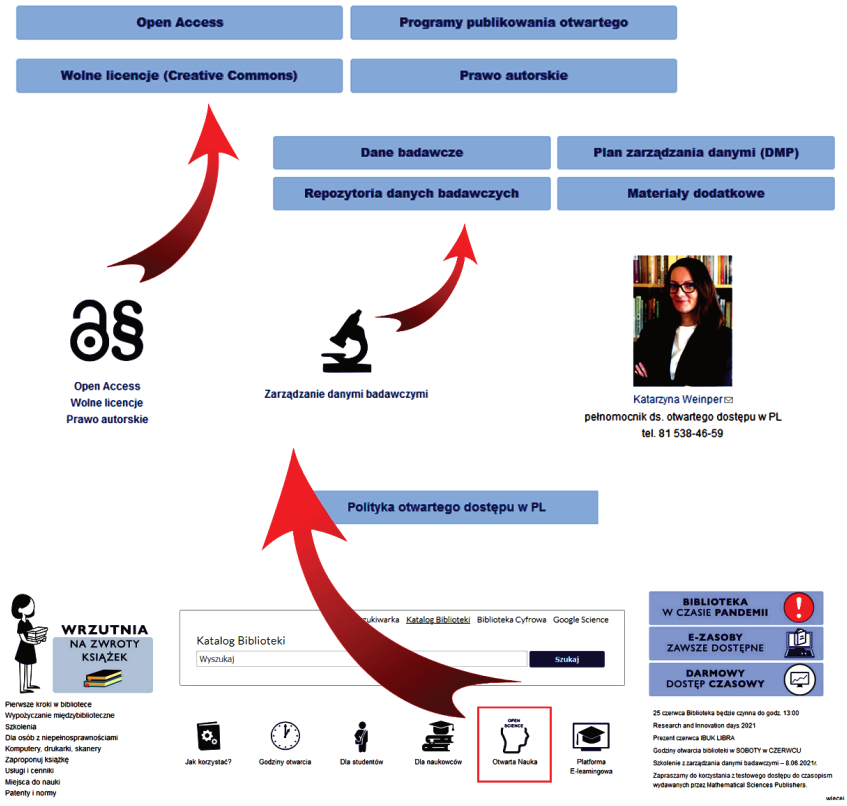

Figure 2. The Open Science Tab on the CINT Home Page
http://biblioteka.pollub.pl/otwartanauka

with the disciplines in which researchers publish. This choice was dictated primarily by the commitment to deposit data in such a way that it meets the FAIR principles.

5. Summary

Academics are becoming increasingly aware of the benefits of open access to publications. They are also becoming more and more convinced that it is worth sharing research data, although they still have not completely overcome their concerns about sharing data in open repositories.

However, the activities undertaken by librarians in recent months demonstrate that there is an understanding that it is necessary for the academic community to follow the postulates of Open Science, and they have shown their willingness to actively participate in international science.

Undoubtedly, not only should researchers be educated in the issues of intellectual property rights, free licenses and proper scientific communication, but an appropriate technological infrastructure should be developed for the proper, open, and safe sharing of publications and research data as well.

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