Research Data: Management and Opening. Polish and European Perspectives

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Abstract

Purpose/Thesis: This paper attempts to present the trends in management and opening of research data in Poland and the European Union, based on the analysis of the recently published Polish and European acts and documents as well as of other international initiatives which might influence scholarly publishing and scholarly communication.

Approach/Methods: An in-depth review of the latest documents was applied.

Results and conclusions: I focused on highlighting the key elements of the reviewed documents and initiatives, highlighting the directions for managing and opening of research data they set and the implications they might have for Polish and European science. I also sketched the possible inconsistencies between the European and Polish policies related to research data and scholarly communication.

Research limitations: The documents investigated for the purpose of this paper were either Polish or provided by the European Union (EU). I have not analyzed the national documents issued by the individual member states of the EU other than Poland. Hence, it is probable that some solutions on research data management and opening already taken on the level of individual member states have not been included in this paper.

Practical implications: This paper may encourage a reflection on the relationship between the regulations issued at the European (EU) or at the national (in this case, Polish), and the practices and requirements of scholarly communication which often contradict those regulations.

Originality/Value: This is the first analysis of the latest Polish and European documents and initiatives as related to data management and open data (open science).

Keywords

Open research data. Research data. Research data management.

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1. Introduction

We are living in the period of dynamic changes in the environment of research on the higher education. Some of these changes pertain to research data management and the so-called "opening of science". Within only six months, at the turn of 2018 and 2019, four important initiatives were launched; each of them may create new issues for research data. And yet, we may assume that there will be more transitions.

In European Union (EU), on 4 September 2018, Plan S was launched to accelerate the transition to open access up to 2020 (Science Europe, 2018a). Signatories of cOAlition S,

13 countries, agreed that all data and results of research financed by the research funding bodies must be published in the open access. On 31 May 2019 the revisions of Plan S' principles and implementation guidance were published[1], the timeline for implementation was extended to 2021 and the criteria of transformation towards open access were broadened, among others.

In turn, on 1 October 2018, The Constitution for Science – a new Act on Higher Education – came into force (Ministerstwo Nauki i Szkolnictwa Wyższego, 2018) in Poland. According to its authors, it gave Polish science an opportunity for pro-quality development and visibility in the world. It drew new challenges, particularly for Humanities and Social Sciences (HSS), as well as offered new outlooks for Polish scholarly communication.

On 30 January 2019 the European Commission published a report of the expert group titled *Future of Scholarly Publishing and Scholarly Communication* (European Commission, 2019). The expert group did propose a set of directions which scholarly communication should follow to be more effective, accessible and maximally usable; in general, the report had a pessimistic view of evaluation – and rankings-driven research and scholarly communication. According to its authors, scholarly publishing and communication can be meaningfully changed only if the agencies funding research initiate and lead such a change.

Finally in May, European University Association (EUA) published its latest report on the so-called *Big Deals* contracts[2] (Morais et al., 2019). For 31 national consortia representing 30 EU countries the total subscription fee for periodicals was reported to be 726.350.945 EUR (with average yearly increase of 3.6%). Although 68% of those countries had a national open access policy, 55% of contracts did not include any specific provision for open access in these countries' big deal contracts. It was reported that 56% of subscriptions costs were spent on Elsevier publications; Wiley came second at 18%.

Research environment and scholarly communication operate therefore in a specific "duality". On one hand, there is a call for actions aimed at science opening, while on the other hand, the researchers are "prisoners" of high-impact journals, offered by the leading publishers where choosing gold open access way is costly and not affordable to many. Between 2012 and 2018 we witnessed a movement called "The Cost of Knowledge boycott"[3], targeted against Elsevier's business practices (such as excessively high prices or/and lobbying in support of policies aimed at restricting the free exchange and access to information). It was an American grassroots initiative without a larger, international impact. However, as Tenent (2018, 39) pointed out, at least it worked as an expression of the academics' continued dissatisfaction with Elsevier – no other publisher has received this kind of negative attention – but then no other publisher fell into disfavor as much as Elsevier did.

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[1] https://www.coalition-s.org/rationale-for-the-revisions/

[2] *Big deals* term is used to describe subscription agreements for electronic resources with the biggest publishers, like for ex. Elsevier, Springer-Nature, Taylor-Francis, Wiley, or American Chemical Association.

[3] http://thecostofknowledge.com

2. Research Data and Their Management

Horizon 2020, the EU Framework Programme for Research and Innovation (European Commission, n.d.), defines research data as information, particularly facts or numbers, collected to be examined and considered and as a basis for reasoning, discussion or calculation.

Research Data Management (RDM) has emerged as a topic of the 21st century science, related to what is the so-called fourth paradigm (Hey, 2009). The common use of ICT tools made research more intensive, technology – and data-driven and allowed handling huge volumes of data. Although there has been considerable investment in services, resources, and infrastructure to support researchers' data management needs, the level of researchers' awareness and skills regarding their own data management is still rather low; and RDM depends on institutional strategies and research habits in specific disciplines (Bryant et al., 2017; Burgi et al., 2017; Johnson et al., 2014).

Opening research data should be supported by increasing the awareness and skills required by RDM. Some studies have already confirmed low level of comfort and expert self-assessment with the life cycle of research data – and RDM-related topics (see e.g. Burgi et al, 2017; Conrad et al, 2017). Furthermore, one of OCLC's research reports highlighted the efficacy of education services in promoting RDM recognition with curation and expertise as the most important (Bryant et al., 2017). In this context, in 2017 and 2018 the Information Literacy Association coordinated an international research project ReDaM aimed to collect data about data literacy of academics and research students in higher education institutions. A part of this project was a study conducted in Poland (Wiorogórska et al., 2018). The purpose of the study was to explore the types of RDM of academic staff and research students and to assess the RDM awareness level of both target groups. The objective was to investigate the RDM practices and to find whether there were any differences between the practices of academic staff and of research students. The results of the Polish part of the study revealed that although a significant number of respondents was familiar with the basic concepts related to RDM, they had not used institutional solutions, including the Data Management Plan (DMP) in particular provided by their parent institutions. Most frequently, the respondents were not aware that such solutions were available. The study also noticed significant differences between academic staff and research students where their opinion on the usefulness of DMP (academic staff more often than research students perceived this tool as useful) and on the usefulness of formal training on metadata (research students more often than academic staff perceived this kind of training as useful) was concerned.

Undoubtedly, there is a need for enhancement of education on RDM for academic staff both to raise awareness and to present the benefits of data opening. So far in Poland, the Open Science Platform (*Platforma Otwartej Nauki*, http://pon.edu.pl) has been organizing regular workshops on RDM since 2015, approximately twice a year. However, they are not widely accessible since they take place on-site in Warsaw and the number of available places is limited. In Europe, academic libraries offer RDM education – it is enough to mention the solutions implemented by Switzerland, Estonia, or France (Burgi et al., 2017; Heidelberg University, 2018; Tarkpea & Seiler, 2016). However, system solutions, founded by government or research agencies, like those established in Australia or Great Britain, such as national data centers or data services support RDM more successfully.

In 2004, the British Data Curation Centre (DCC)[4] was established to provide expertise in digital information curation and hence to support researchers in the United Kingdom. This big multi-structured organization offers trainings, guidelines, events, and support in data management planning, data preservation, copyright issues, or creating institutional policies. Recently, it has been actively involved in open science advocacy in the UK.

Four years later, in 2008, the Australian National Data Service (ANDS)[5] was founded by the Australian Government. ANDS offers support in managing research data, but it also offers services that allow researchers to share their data, making them more visible and reusable. For example, ANDS hosts Research Data Australia (RDA)[6] discovery service that enables researchers to access and reuse datasets created by Australian researcher organizations, government agencies, and cultural institutions. Although their main mission is to: "make Australia's research data assets more valuable for researchers, research institutions and the nation", by opening Australian data, ANDS helps to promote national research and makes it visible worldwide. Thus, Australia has already opened its data and made them FAIR (for details on FAIR see section 3.1).

3. Data Opening

The Open Data Handbook defines open data as

> data that can be freely used, re-used and redistributed by anyone – subject only, at most, to the requirement to attribute and sharealike (Open Knowledge International, n.d.).

Open data is a crucial component of the so-called "Open Science", a concept defined by OECD as

> unhindered access to scientific articles, access to data from public research, and collaborative research enabled by ICT tools and incentives (OECD, 2019),

and by the European Commission as

> a new approach to the scientific process based on cooperative work and new ways of disseminating knowledge, improving accessibility to and re-usability of research outputs by using digital technologies and new collaborative tools (European Commission, 2018a, 12).

3.1. European Union and Data Opening

The European Union has been encouraging the opening of data and open science initiatives through several projects aimed at supporting policy makers, stakeholders, or researchers. Open Science[7] portal hosted by the European Commission fulfils one of the goals of the EU research and innovation policy. It was created as an online hub to share European Commission's news, events, and publications related to Open Science.

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[4] http://www.dcc.ac.uk/
[5] https://www.ands.org.au/
[6] https://researchdata.ands.org.au/
[7] http://ec.europa.eu/research/openscience/index.cfm

In October 2017 European Open Science Cloud (EOSC)[8] Declaration was signed. EOSC's aim is to establish a trustworthy environment for processing and hosting research data to support European science. One of EOSC's strategic goals is to implement FAIR Research Data Principles.

The FAIR Principles (the abbreviation "FAIR" stands for: Findable, Accessible, Interoperable, Reusable) were drafted in 2015 at a Lorentz Center workshop in Leiden, The Netherlands. Since then, they have received worldwide recognition by various organizations, including the European Commission, as a useful framework for thinking about sharing data in a way that will maximize use and re-use. The authors of a Final Report and Action Plan on FAIR Data admitted that introduction of the FAIR principles requires significant resources at the disciplinary level so that the data-sharing framework might be developed, i.e. principles and practices, community-agreed data formats, metadata standards, tools, data infrastructures, etc. (European Commission, 2018b, 11).

To support open scholarly communication and foster open science in EU, OpenAIRE[9] was established. This non-profit civil partnership is an European Commission-related project financed from Horizon 2020 program. It works in EU member states through the network of National Open Access Desks (NOADs) whose task is to connect researchers, research institutions, policy makers, citizen scientists, educators, industry, and the general public at a national level on the one end, and the OpenAIRE services on the other (OpenAIRE, 2018, 4). In Poland, NOAD is held by Interdisciplinary Centre for Mathematical and Computational Modelling (ICM UW), the leader of the abovementioned Open Science Platform.

Facilitating Open Science Training for European Research (FOSTER)[10] project was launched on the similar principles to OpenAIRE. Founded by the EU's Seventh Framework Programme, a partnership of 11 EU universities and organizations (LIBER, DCC, and ICM UW among others). It aimed to provide a European-wide training program, targeted particularly at young researchers, so as to help them understand and implement open access policies in Horizon 2020 (described below). Therefore, it focused more on cultural change, the modification of previous practices in scholarly communication and the researchers' behavior to ensure that open science becomes a standard. The duration of FOSTER's two phases was 4.5 years (between February 2014 and May 2019). It resulted in a number of events, onsite and online trainings, videos, podcasts, and Open Science Toolkit (a set of ten online courses).

Nevertheless, all those documents, initiatives, and projects described above are merely EU's recommendations, declarations, or supporting actions. They are not regulations, and thus they do not have a binding legal force. In practice, it means that the research governing agencies or research funding bodies in EU member states are not obliged to follow these suggestions. It also means that the researchers are not obliged to adhere to open science principles as they will not be evaluated according to them. Therefore, they do not have to be afraid that there will be any negative consequences to actions contradicting these principles.

The opposite is the case with the Horizon 2020 Program. In fact, it was the first EU-funded research program that imposed the rule of open access on its beneficiaries. Under Horizon

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[8] http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

[9] https://www.openaire.eu/

[10] https://www.fosteropenscience.eu/

2020 the European Commission offers prestigious ERC grants for conducting pioneering, innovative studies to ensure research excellence in all fields of science. Previously, ERC grants were founded by the EU's Seventh Framework Programme. Now, under Horizon 2020-financed projects

> beneficiaries of ERC grants must ensure open access (free of charge, online access for any user) to all peer-reviewed scientific publications relating to its results" (European Research Council, 2017, 3).

The grantees choose between a green and a gold open access route; they must also deposit an electronic copy of their publication(s) in a repository and ensure the open access to the deposited version. Horizon 2020 also offers a Pilot on Open Research Data. This means that grantees may, but are not obliged to, facilitate the access, re-use and preservation of research data generated during their research work. These regulations are model-based solutions for opening access to research data. However, it still concerns only a minority of scholarly input in the EU. For instance, in Poland there are only 16 on-going ERC grants (February 2019 status)[11], although a new call for ERC Advanced Grants applications was opened in May 2019.

3.2. *National and International Undertakings*

When talking about the opening of research data and, more broadly, the open science, it is important not only to describe the legal foundations, but also to highlight the obstacles to the process of opening.

In November 2018, a report on Elsevier titled *Democratising Knowledge* (Tennant, 2018) was published. It provides an in-depth exploration of the business model and publication practices of this biggest scholarly publisher, often called the monopolist in the scholarly publication environment. These practices not only limit the open access to research results. By promoting different commercial bibliometric and evaluation tools (e.g. Scopus or SciVal) specific to itself, Elsevier forces the higher education institutions into a position of dependence and costly cooperation.

The second obstacle might be national regulations and policies' reliance on bibliometrics and preference for high-impact, internationally indexed publications, preferably in English and in internationally recognized journals. Such a scholarly communication model is not only very expensive, but it also limits the scope of possible places of publication to the most recognized ones, i.e. those managed by the biggest worldwide publishers (like Elsevier, IEEE, Nature, etc.).

There were, however, some higher education institutions, consortia, or science governing agencies who dared to show their resistance against the practices limiting the academic and research freedom. In February 2019, University of California (UC)[12] announced the termination of their subscription to Elsevier. To justify this decision, they said that being a leader in the global movement toward open access to publicly funded research is contradictory

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[11] Source: National Contact Point for Research Programmes of the European Union (http://www.kpk.gov.pl/?page_id=10227).

[12] University of California encompasses 10 campuses (for. ex. Berkeley, Los Angeles, San Diego) and three national research laboratories for the US Department of Energy (Los Alamos, Lawrence Berkeley, and Lawrence Livermore). See https://www.universityofcalifornia.edu/

with spending large amounts of money on access to knowledge[13]. While negotiating, UC wanted Elsevier to ensure universal open access at least to UC research; the publisher did not comply to meet this term.

One month later, Norway also decided to terminate its institutions' subscriptions to Elsevier. And what did not work in the US, seems to have worked in Norway. Elsevier quickly sat at the negotiating table and in April 2019 they agreed with the Norwegian consortium for higher education and research on a two-year pilot program aimed, on one hand, at providing open access to research for a Norwegian research community and, on the other hand, at allowing Norwegian researchers to publish in open access. In result, seven universities and 39 research institutions across the country have full read access to the whole Science Direct Freedom Collection. Starting from January 2019, articles with Norwegian corresponding authors are published in open access with a CC-BY-license. Authors who have already published with Elsevier in an eligible journal will be contacted by Elsevier and offered to make the article in open access at no extra cost. This pilot program will ensure that about 90% of the article output from Norwegian institutions in Elsevier journals will be published with an open license in Gold Open Access and in hybrid journal titles.

These two cases may prove that it is not the law that regulates scholarly communication patters at the national level, but rather persistence and local initiatives. What occurred at the University of California did not have an impact on the whole California state, not mentioning the whole country. The Norwegian case shows that an active consortium in a smaller (as a reminder: having seven universities only), but well-governed country may achieve more than a big federation.

3.3. Poland

In 2015, The Ministry of Science and Higher Education published a 20-page document titled *Directions of the development of open access to research publications and research results in Poland*[14], where it presented the principles of open access policy and proposed recommendations for open access to publications and to the results of research funded by financing agencies as well as by research units, higher education institutions, and publishers. The Ministry recommended national research financing bodies that they apply and publicize the rules of open access. This document was based on the EU Commission Recommendation of 17 July 2012 on access to and preservation of scientific information[15], but it was published in Poland only three years after its publication in the Official Journal of the European Union!

Apparently, nothing has changed in this field in Poland since then, so the Ministry somehow managed to put pressure on one of the biggest research financing agencies, supervised by the Ministry of Science and Higher Education, the National Science Centre (NCN), to enforce these recommendations. This way, in March 2019 the NCN Director

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[13] The full text of statement is available at https://www.universityofcalifornia.edu/press-room/uc-terminates-subscriptions-worlds-largest-scientific-publisher-push-open-access-publicly

[14] https://www.gov.pl/documents/1068557/1069061/20180413_Kierunki_rozwoju_OD_wersja_ostateczna.pdf [own translation of the title].

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012H0417

issued an open letter[16] where, having referred to the same EU Recommendation of 2012 (seven years later!), he reminded about the guidelines intended to make research data management more uniform across various member states (Science Europe, 2018b) and the project of incorporating a requirement of presenting data management plan (DMP) into the applications for a NCN research grant. According to this letter, DMP will be an element of the first stage of implementing open access to research data in Poland.

For those who are aware what DMP serves, this statement sounds simply ridiculous. Yes, DMP is a very important element of the research cycle and it may help researcher to describe what s/he is going to do with data during and after her/his research project. Obviously, it may also facilitate setting a standard of data openness (and thus, the possibility of sharing) or confidentiality, and to define the period and conditions of data preservation after the research is completed (see e.g. Buddenbohm et al., 2016; Carlson et al., 2011; Higman & Pinfield, 2015). However, without a solid legal national policy DMP itself will not ensure open science. This process should be first managed by the state: firm decisions about open access roads should be taken and then, elements of more far-reaching policies might be implemented in the research grants application requirements.

The researchers in Poland must be first assured that when opening their data, they will not lose their evaluation points, that publishing in open access will give them the same career benefits as publishing at the biggest publishers, or that they will be given money for choosing the golden open access route.

4. Conclusion

Even though the analysis of several documents and initiatives showed how important openness seems to be for stakeholders and EU governance, my vision of the short-term perspectives for the nearest future of data opening is not optimistic. In everyday research and communication practice, the non-profit ideas meet a strong pro-profit movement (the so-called paywalls). Proponents of open access and open science policies use catchy slogans, but as long as they will not be supported by strong legal acts, there will not be a definitive change. It is important to remember that regulations and directives are the sole binding legislative acts on the European level. Recommendations, opinions, or decisions are presenting a view and preparing a line of action[17]. And to inspire a change, also a change of mentality, on the one hand the law is needed, and on the other hand, more sustainable and open alternatives for researchers. Currently, the majority of EU state members rely on the contents offered by one or two biggest publishers, not only for subscriptions to e-resources, but also for evaluation of science. For example in Poland, since 2018, InCites by Web of Science and SciVal by Elsevier are purchased under the national license and ultimately, it will be one of these tools that is used for the evaluation of researchers under the new Act on Higher Education, which will only strengthen the position of the big publishers' on the market and in the research environment. In 2017, the Association of European Research

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[16] https://www.ncn.gov.pl/sites/default/files/pliki/2019_04_03_pismo_dyrektora_NCN_zarzadzanie_danymi_naukowymi.pdf

[17] https://europa.eu/european-union/eu-law/legal-acts_en

Libraries (LIBER) presented Five Principles for libraries to use when conducting Open Access negotiations with publishers[18] (since LIBER joins academic libraries which mostly take care of e-resources subscriptions in higher education institutions). The report on *big deals* (Morais et al., 2019) cited above revealed that two years later the majority of EU universities has not implemented those principles, so they are still paying double: the researchers pay for being published and the universities pay for access to their researchers' publications. I agree with the authors of Future of Scholarly Communication report. No matter how much will be written about opening data and how many institutions will be encouraged to promote this movement,

> (t)he evolution of open access and open science is tied to the ways in which these actors will cooperate with each other, or struggle against each other, and for this reason, their futures remain unclear (European Commission, 2019, 23).

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Dane badawcze: zarządzanie i otwieranie. Perspektywy polskie i europejskie

Abstrakt

Cel/Teza: Celem artykułu jest nakreślenie kierunków zarządzania i otwierania danych badawczych w Polsce i w Unii Europejskiej, na podstawie analizy ostatnio opublikowanych polskich i europejskich aktów prawnych i dokumentów innego typu, a także różnych międzynarodowych przedsięwzięć, które mogą mieć wpływ na komunikację i publikowanie naukowe.
Koncepcja/Metody badań: Wykorzystano krytyczną analizę dokumentów prawnych i piśmiennictwa przedmiotu.
Wyniki i wnioski: Skupiono się na uwypukleniu kluczowych elementów omawianych dokumentów i inicjatyw, podkreślając, jakie kierunki wyznaczają one w zarządzaniu i otwieraniu danych badawczych i jaki wpływ mogą wywrzeć na polską i europejską działalność naukową. Nakreślono także możliwe sprzeczności pomiędzy europejskimi (unijnymi) a polskimi politykami dotyczące danych badawczych i komunikacji naukowej.
Ograniczenia badań: W artykule skupiono uwagę na dokumentach i inicjatywach polskich i wydanych (zainicjowanych) przez Unię Europejską (UE). Nie poddano analizie dokumentów poszczególnych państw – członków UE. Jest zatem możliwe, że pewne rozwiązania w zakresie zarządzania i otwierania danych badawczych zostały podjęte na szczeblu krajowym w niektórych z tych państw, jednak nie zostały one uwzględnione w artykule.
Zastosowanie praktyczne: Artykuł może stanowić podstawę do refleksji nad powiązaniami pomiędzy regulacjami wydanymi na szczeblu europejskim (unijnym) i krajowym (w tym przypadku polskim) a dotychczasowymi praktykami i wymaganiami stawianymi obecnie w komunikacji naukowej, często stojącymi w sprzeczności z tymi regulacjami.
Oryginalność/Wartość poznawcza: Zgodnie z wiedzą autorki, artykuł jest pierwszą próbą analizy najnowszych polskich i europejskich dokumentów i inicjatyw związanych z zarządzaniem danymi badawczymi i otwieraniem danych (otwartą nauką).

Słowa kluczowe

Dane badawcze. Otwarte dane badawcze. Zarządzanie danymi badawczymi.

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