Open Access

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[1] PIRO4D. *Earth*. Image numérique. Pixabay. 6 août 2021.

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1. Introduction OA

1. 1. Definition

"By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited." (Budapest Open Access Initiative)

1. 2. Introduction

Open access appeared in the early 90's thanks to the development of the internet, with the creation of the first scientific journals accessible online and the first open archive (arXiv).

This movement is in response to the never-ending growth in the costs of scientific journals[2]. This increase is such that libraries are forced to choose between different journals because their budget is no longer sufficient. These events lead to particularly ridiculous situations: the university library of Namur could not give its readers access to an article published by its own University. This increase has affected the whole scientific world, including Harvard University, which has a much larger budget than us.

In this practice, the university pays twice and loses out completely. The university pays the researcher to conduct his/her research and then pays for a subscription to scientific journals to have access to the results of the research.

The researcher needs to publish in order to be recognized and to make his or her research known and has no other alternative than to submit his or her work to high-impact journals whose subscription fees are outrageous.

That's why the European union established, in 2002 and 2003, that all research funded in part or fully by public funds should be accessible to all.

[2] Due to the near-monopoly of certain publishers

2. Open Access

There are different routes to achieve open access to journals. Here are the most common ones :

2. 1. Green route / self-archiving

It's based on self-archiving. The researcher registers his articles in an archive, a repository or a directory. These can be :

- "institutional", set up by an institution to group all the publications of its members, such as PURE for UNamur or ORBI for ULiège.
- thematic archive, created by institutions, open to all but limited to a subject, such as arXiv which contains only publications related to physics.

You will often find preprint versions that have not been peer-reviewed. You must therefore be careful about the type of document you consult if you're going to use it. This route is used as a complement to publication with a publisher. Given the extent of the movement, publishers have been forced to revise their editorial policies and allow the deposit of preprints.

The following two sources will allow you to find an archive or a directory specific to your field of activity : OpenDOAR, ROAR

2. 2. Gold route / pay-to-publish

The article is published in an Open Access journal where the content is completely free for everyone. They have a peer review process, an editorial board and even an impact factor. The difference between traditional newspapers and the golden way journals is in its economic model. Where the reader used to pay for access to the content, here it is the author and/or his institution that pay to put his article in open access. Currently, there are three different economic models :

APC (Article Processing Charge) [3] model

It's a fee called Article Processing Charge (APC) that covers the cost of publishing. This cost changes from one editor to another. PLOS often uses this model but beware of abuse and fraud.

- Predatory journals : they invite you to publish by email. Very often, their message looks like a spam, on their website there's little information about peer review, the editorial board, no editorial chief, the journal's name doesn't reflect his content, ... In

[3] Voir Glossary

many cases, your article isn't published or isn't reliable because it wasn't peer reviewed. Here's a non-exhaustive list of those predators « Stop Predatory Journal ».

- Hybrid journals are created by big traditional editors. All the articles aren't in open access. The journal publishes both regular and open access articles provided that an additional fee is paid for this option. The university has a subscription to access to the journal and the researcher has to pay again to have his article in Open Access.

- High APC cost. Editors inflate the prices of their APC (sometimes more than 3000€). It's often used by hybrid journal.

Subscription

The journal is distributed once the target financial threshold has been reached thanks to contributions from member institutions. Knowledge Unlatched Knowledge unlatched uses this model.

Transformative Agreement or Publish and Read

This is an agreement between an institution and a publisher that allows members of the institution to read articles and publish in that publisher's journals at no additional cost. The price of this agreement is estimated based on the number of articles that researchers will publish and is reevaluated at the end of each contract.

Institutions believe that this is not really a fair model, as it steers, or even forces, researchers to publish in specific journals (researchers lose their right to choose the journal). Furthermore, the price is set based on the number of articles that are likely to be published. However, this number may be exceeded in some years or overestimated in others.

Several publishers offer this formula: Oxford Academic, Cambridge University Press, Royal Society, Elsevier, etc.

2. 3. Diamond OA

This model does not pass on any costs to authors or readers. It mainly involves journals or platforms created by universities, scientific institutes, etc. For example, the University of Liège has created journals on various topics in which its researchers publish free of charge.

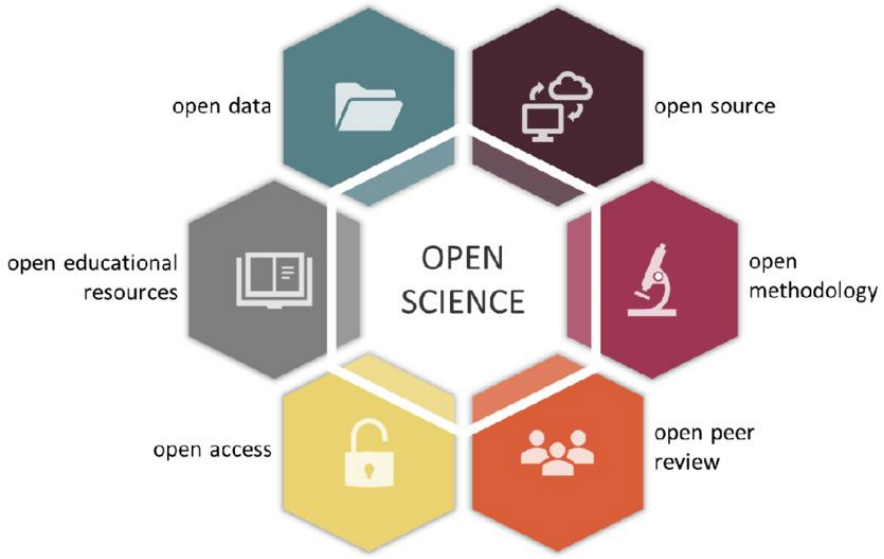
They mainly use two funding models: "Freemium" or subsidies.

- Freemium: The article can be read in HTML format, but downloading the PDF or EPUB format requires payment. Open Edition uses this model.

- Subsidy: Publication is funded by a learned society, institution, foundation, etc. Most journals listed in DOAJ (a directory that lists many Open Access journals) use this model.

3. Open Science

Open access is part of a larger movement called "open science" which aims to make research more transparent and collaborative by making every step open. As shown in the image below, many fields are already involved. There is now a lot of open source software, open peer review journals, documentation of research methodologies, platforms compiling data in a specific field, ...



[4]

3. 1. Open data

The data is freely accessible and reusable by everyone. This allows for collaboration on a larger scale. It is well known that two heads are better than one!

The data comes from all over the world, which means that large-scale studies on the environment or astronomy, for example, can progress more quickly and find new solutions to current problems.
A concrete example: OpenStreetMap is a geographic database updated by a community. Members collect data from studies and use freely licensed aerial or satellite images. The data is royalty-free and reusable, provided that OpenStreetMap is credited.

Many portals list open access data. They can be grouped by subject area, country, or university.

[4] Gallagher, Rachael et al. *The six core principles of open science which guide the open traits network.* Image numérique. ResearchGate. Avril 2019. 2 août 2021.

A concrete example: in Belgium, we have « The Belgian Data portal », which brings together various open data platforms, such as « Dataverse », created by the University of Liège. Some authors even provide access to the research methodology used to obtain the results.

When we want to open up access to our data, we must ensure that it complies with the "FAIR" principles :

- Findable. We give a unique identifier to find them easily (such as ISBN). And we describe them with metadata.
- Accessible. It is clearly indicated where they are located and how they can be accessed: open to all, on request, authentication procedure,…
- Interoperable. In order to facilitate the reuse of these data, they must respect certain standards of use and share the same vocabulary. This language must be formal, accessible, shared and widely applicable.
- Reusable. The metadata must clearly mention the access license to be followed in case of use.

4. European legislation

4. 1. Horizon 2020

With Horizon 2020, publicly funded research must be freely accessible to all in order to promote the dissemination of knowledge, innovation, and scientific transparency.
In practical terms, researchers must make their articles available in open access. This can be done either by publishing in a fully open access journal or by depositing a version of the article in an institutional or disciplinary repository such as Zenodo or HAL. Even in the case of traditional publication, deposit in a repository remains mandatory. Metadata must also be open and mention Horizon 2020 funding.

4. 2. Horizon Europe

Horizon Europe succeeds Horizon 2020 and pursues the same overall objective: to support excellent research, strengthen European competitiveness, and respond to major societal challenges.
This second strategic plan aims to address key global issues such as climate change, biodiversity loss, the digital transition, and population aging.
Horizon Europe is structured around three main pillars :

1. Excellent science
2. Global challenges and European industrial competitiveness
3. Innovative Europe

Overall, Horizon Europe aims to consolidate the European Research Area, promote the circulation of knowledge, and strengthen the Union's capacity to produce scientific and technological solutions for the benefit of society.

5. Glossary

Impact factor

It is an indicator that estimates the visibility of a scientific journal based on the number of citations. The higher the impact factor, the more visible the journal is and therefore the more it is considered a reference in its field. The impact factor is different for each discipline. It is used by traditional journals to encourage researchers to publish with them. In truth, the impact factor is not necessarily a guarantee of quality, because it is enough for journals to have only 2-3 articles that are cited many times to increase this figure.

Article Processing charge (APC)

Also known as a publication fee, which is sometimes asked to the authors. The purpose is to make a work available in open access (OA), in either a full OA journal or in a hybrid journal. This fee may be paid by the author, the author's institution, or their research funds. https://en.wikipedia.org/wiki/Article_processing_charge

Creative commons

The creative commons have defined 6 licenses that can be given to an article. They inform the reader of what he can do with the article : attribution (mentioning the author), no commercial use, sharing with same conditions, no modifications.
It gives every person and organization in the world a free, simple, and standardized way to grant copyright permissions for creative and academic works; ensure proper attribution; and allow others to copy, distribute, and make use of those works.
https://creativecommons.org/about/

Embargo

An embargo is a period that can go from 3 to 12 months, during which a document published on the Internet (publisher's website, institutional archive, ...) is not available. It is the concession made to publishers to respect their editorial policies.

Interoperability

Interoperability means that different information systems can interact with each other by exchanging information in a correct and uniform language.

Metadata

Metadata are structured data that describe online or physical resources. They are essential and it’s necessary that they are structured to allow interoperability between electronic devices.

Peer review

When an article submitted to an editor is accepted by the editor, the editor contacts researchers who work in the same field to review the article by providing comments, asking questions of the author, etc. Traditional peer review does not disclose the names of these reviewers. Traditional peer review does not disclose the names of these reviewers.

Transformative Agreement

A “transformative” agreement is a contract between institutions (libraries, consortia) and scientific publishers that changes the economic model of publishing. It aims to transform subscription payments (‘read’) into fees covering open access publishing (“publish”), thereby facilitating the transition to open science.

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