

Open access to the scientific literature: a peer commons open to the public

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1-The cumulative research cycle

Research results are based on collaborative, cumulative work in an interactive research cycle: scientists search and read current findings in research journals, formulate and test hypotheses experimentally or computationally, and then publish their findings in research journals, continuing the global cycle. Over two million articles a year are published in about 25 000 peer reviewed journals, but no university can afford access to more than a fraction of those journals[1]. Hence those present and past articles are inaccessible to many of their potential users. The result is that access to knowledge is being denied and money spent on conducting research so it can be built upon globally is being wasted.

2-Publicly funded research

It is estimated that 90% of worldwide scientific research is publicly funded so it must be considered as a public good, open to the public. But who is the public? Of course, every tax payer should be able to be informed of the scientific progress he has supported, but even more important to the tax-payer is that the scientists for whom the research was written can access it, so they can use, apply and build upon it, for the benefit of the tax-payer and for global scientific progress. When a researcher publishes he wants his work to be known, read, used and cited by his peers.

The Internet has made it possible to maximize public access to publicly funded research by making research findings freely available online immediately upon passing peer review. Perhaps the best-known call for free access to research was Stevan Harnad's "Subversive Proposal" in 1994, but other calls were also being made in Germany at the same time. For example, the Luegger/Groetschel talk in Halle, likewise in 1994, at a gathering of German scientists (mostly mathematicians and physicists), later called the Halle-meeting [2] at which our Euroscience member, Eberhard R. Hilf, declared that all journals "Should be free for all to read" [3]. Both calls led to the creation of the mathematics and physics archives www.math-net.de and www.PhysNet.net which link and search through the institutional webspace of their respective institutions worldwide. Fourteen years later there is nothing subversive in this idea of free access to research and we call it "Open Access" (OA). Today it is recognized worldwide that publicly funded research should be freely accessible to the public, and that OA increases citations and science progress.

3-Globally collaborative e-science in the Internet era

We are at the frontier between two cultures: Paper culture and Internet culture. Computer science is creating a growing number of collaborative tools that are increasingly being adopted, especially by young scientists. Some of these tools are for interactive use between individuals (e-mails, discussion lists, common editing tools). The OAI-PMH protocol for database interoperability has made possible the global sharing of findings by the entire research community worldwide, allowing the contents of distributed repositories to be harvested and integrated as if they were one. As a direct result, we have seen the

creation and dramatic growth of OAI-compliant institutional repositories (more than 1100) in which each institution can deposit its research output to make it OA. Tools help in retrieving articles (e.g., Google scholar, OAIster), some of them scientometric, measuring and navigating usage and citations (Citebase, Citeseer). Many scientometric studies have shown that OA increases usage and citations by 25% to 250% in all fields of research; according to a recent study it also diversifies citations across fields.

4-Open Access: “Gratis” and “Libre”

In 2002 the Budapest Open Access Initiative (BOAI) provided the first definition of Open Access[4] as peer-reviewed research that is freely accessible and reusable online. Six years later, Peter Suber and Stevan Harnad have further refined the definition, with free online research access being called “Gratis OA” and if it has certain re-use rights, it is called “Libre OA”. Here is what Peter Suber wrote in his SPARC letter August 2008[5]:“... the term "gratis OA" [is used] for the removal of price barriers alone and "libre OA" for the removal of price and at least some permission barriers. The new terms allow us to speak unambiguously about these two species of free online access.”

5-Gratis OA is provided by self-archiving

“Self-Archive Unto Others as Ye Would Have Them Self-Archive Unto you”. Wrote S. Harnad in 2003.[6] All research needs to be deposited in the researcher’s institutional repository for the sake of all would-be users worldwide whose institutions cannot afford subscription access to the journal articles they need. Over 63% of journals have already endorsed making that deposit -- the final peer-reviewed draft (“eprint”)-- Open Access, immediately upon acceptance for publication. For the remaining 37% of deposits, they can be made as “Closed Access.” The institutional repositories have a semi-automatic “email eprint request” button that allows users to request and authors to provide a single eprint of Closed Access deposits for research purposes during any publisher access embargo. This means the global research community can immediately have at least 63% OA plus 37% almost-OA simply by self-archiving all peer-reviewed research in institutional repositories.

6-A mandate is necessary to accelerate OA self-archiving

International, cross-disciplinary surveys by Alma Swan[7] have revealed that researchers will only self-archive if and when their institutions and/or their funders mandate it. Outcome studies by Arthur Sale[8] have confirmed that institutions without mandates only achieve 15% deposits, 30% with incentives and help; but they approach 100% self-archiving within two years if they adopt a mandate. A self-archiving mandate has already been adopted by 57 research funders and universities worldwide (plus 11 more mandates proposed).

There are various ways to ensure the filling of a repository with its target OA content: A first step is for librarians to highlight the advantages of OA self-archiving[9] for all those involved, from individual researchers to the institution as a whole. Once those in charge have understood the benefits of self-archiving, they are in position to mandate it, along with incentives for the various laboratories, with institutional performance review of researchers, laboratories and departments, as well as record-keeping and metric generation being henceforth based on work deposited in the university’s own repository.

The following table is extracted from the Registry of Open Access Repository of Material Policy (**ROARMAP**) [10].

List of countries with mandates on the 20th October

	Mandates (n)	Proposed mandates (n)	
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Country	departments	institutions	funders	institutions	funders	multi-institutional	Total
Australia	1	4	2				7
Austria		1					1
Belgium		1	1				2
Brazil						1	1
Canada			4		1		5
China						1	1
Spain		1					1
Europe		1	2		2	1	6
Finland		1					1
France	1		1	1			3
Germany		1					1
India		2			1		3
Ireland			2				2
Italy		1					1
Norway				1			1
Portugal		1					1
Russia		1					1
Switzerland		2	1				3
Turkye		1					1
Ukraine						1	1
UK	2	4	13				19
US		3	2		1		6
Total	4	25	28	2	5	4	6

7-SPARC and Creative Commons white paper. To spread the idea of self-archiving in the university, SPARC and Creative Commons drafted in April 2008 a white paper called **Open Minds -- Open Doors: What faculty authors can do to ensure open access to their work through their intuition**[\[11\]](#). The white paper clearly recommends a deposit mandate for every institutional repository. (It also distinguishes the Gratis (free access) and Libre (re-use) OA, recommending the adoption of an automatic licence that applies to the work before the transfer of copyright to the publisher.)

8-The Brisbane Declaration: A concrete policy model for global adoption

Following the conference on Open Access and Research held in September 2008 in Australia, and hosted by Queensland University of Technology, the following statement was drafted and adopted with the endorsement of over sixty participants. At the conference, the Minister of Research, Innovation and Industry, Kim Carr also affirmed his support for OA.

Preamble

The participants recognise Open Access as a strategic enabling activity, on which research and inquiry will rely at international, national, university, group and individual levels.

Strategies

Therefore the participants resolve the following as a summary of the basic strategies that Australia must adopt:

1. Every citizen should have free open access to publicly funded research, data and knowledge.
2. Every [Australian] university should have access to a digital repository to store its research outputs for this purpose.
3. As a minimum, this repository should contain all materials reported in the Higher Education Research Data Collection (HERDC).
4. The deposit of materials should take place as soon as possible, and in the case of published research articles **should be of the author's final draft at the time of acceptance** so as to maximize open access to the material.

(Arthur Sale[\[12\]](#) has added: "While the Brisbane Declaration is aimed squarely at Australian research, I believe that it offers a model for other countries. It does not talk in pieties, but in terms of action. It is capable of implementation in one year throughout Australia. Point 1 is written so as to include citizens from anywhere in the world, in the hope of reciprocity.")

9-The "Cognitive Commons"

"[...]The worldwide web, a distributed network of cognizers, digital databases and software agents, has effectively become our "Cognitive Commons" in which distributed cognizers and cognitive technology can interoperate globally with a speed, scope and degree of interactivity that generate cognitive performance powers that would be inconceivable within the scope of individual local cognition alone".(I.E. DROR & S. HARNAD, 2008) [\[13\]](#)

10-Conclusion:

It is time for the global research community to become “a distributed network of cognizers,” using “cognitive technology” to create the “Cognitive Commons” via OA self-archiving.

[1] The journal holdings data for the US are in the [Association of Research Library Statistics](#). A European example provided by a member of Euroscience Work Group is the University of Oldenburg in Germany, which only subscribes to 1%.

[2] <http://opus.kobv.de/zib/volltexte/1993/496/pdf/TR-93-04.pdf>

[3] <http://www.isn-oldenburg.de/~hilfe/vortraege/halle-ebs/halle-ebs.html>

[4] <http://www.soros.org/openaccess/read.shtml>

[5] <http://www.earlham.edu/~peters/fos/newsletter/08-02-08.htm#gratis-libre>

[6] <http://cogprints.org/3022/>

[7] <http://eprints.ecs.soton.ac.uk/11006/>

[8] <http://eprints.utas.edu.au/264/>

[9] Some of these will be presented in Harnad's talk.

[10] <http://www.eprints.org/openaccess/policysignup/>

[11] http://www.arl.org/sparc/bm~doc/opendoors_v1.pdf

[12] <http://openaccess.eprints.org/index.php?/archives/472-guid.html>

[13] “Offloading cognition onto Cognitive Technology” I.E. Dror & S. Harnad To Appear in: Itiel E. Dror & Stevan Harnad (Eds) *Distributed Cognition*. Amsterdam: John Benjamins.
<http://eprints.ecs.soton.ac.uk/16609/1/distribcogFNL.html>