

## SCHOLARLY COMMUNICATION THROUGH OPEN ACCESS

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### Abstract

Discusses the very term Open Access (OA) as given by Budapest Open Access Initiative, Public Library of Science. Mentions the development of OA and the role of various global initiatives in this regard. Highlights the various types of Open access that are predominantly known. Critically discussed the existing models of OA and proposed a functional model which includes all important issues like peer-reviewing, archiving as well as finance.

**Keyword:** Open Access/ OA, Models of OA/ Types of OA/

### 1. Introduction

The escalating cost of providing access to research materials, together with the license constrains placed on the use of digital contents by commercial publishers, are seriously eroding the ability of libraries to provide students and faculty with the resources. The Open Access (OA) movement has been an important catalyst for change in this regard, prodding publisher to reexamine their access policies and in some cases, to move towards news access models. According to Peter Suber, open-access can be defined by two essential properties. First, it is free of charge to everyone. Second, the copyright holder has consented in advance to unrestricted reading, downloading, copying, sharing, storing, printing, searching, linking, and crawling. The first property solves the pricing crisis. The second property solves the permission crisis (Suber, 2003). The open access movement seeks to change the traditional subscription based model of scholarly publishing to one where readers have unrestricted electronic access to the scholarly literature.

### 2. Definition of Open Access

The most fascinating concept "Open access" (also known as open-access publishing and free online scholarship) as defined by Wikipedia "is an ongoing publication practice which differs in the way traditional methods of publishing papers to the public get submitted, reviewed, authenticated and finally published. The word "open" here means a change in how publication is negotiated between author and publisher and 'access' has an inflex on how the audience can obtain the publication". Peter Suber (2004) has provided a brief definition of open access as literature that is "digital, online, free of

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charge, and free of most copyright and licensing restrictions” whereas, Harnad (2005) advocated “immediate, permanent, free online access to the full text of all refereed research journal articles”.

Budapest Open Access Initiative (BOAI) and Public Library of Science (PLoS) define OA as: “the free availability of literature 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 the internet itself”. (Budapest Open Access Initiative, 2002 and Public Library of Science, 2005). PLoS offers unrestricted access to the scientific literature, while BOAI promotes open access to research article in all discipline. This definition of OA involves availability of scholarly literature at free of cost. On the other hand, the Bethesda Statement on Open Access Publishing in April 2003 and Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in the same year discussed the process of open access in some different way. Both the statement includes the definition of an open access publication as below:

- The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.
- A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository).

### **3. Some milestone towards open access**

The success story of open access was build with the establishment of some projects and initiative worldwide. The first free scientific online archive arXiv.org was started in 1991, initially a preprint service for physicists, initiated by Paul Ginsparg. Self-archiving has become the norm in physics, with some sub-areas of physics, such as high-energy physics, having a 100% self-archiving rate. In 1997, The Association of Research Libraries developed the Scholarly Publishing and Academic Resources Coalition (SPARC), an alliance of academic and research libraries and other organizations, to address the crisis of scholarly communication and to develop and promote alternatives, such as open access. Many open access projects involve collaborations by people around the world, both expected and unexpected. In this context, Scientific Electronic Library Online, or Scielo, is a comprehensive approach to full

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open access journal publishing, involving a number of Latin American countries. In the same year Bioline International — a not-for-profit organization dedicated to helping publishers in developing countries. Bioline is a collaboration of people in the UK, Canada, and Brazil; the Bioline International Software is used around the world. In 1997, the U.S. National Library of Medicine made Medline freely available. In 2001, 30,000 scholars around the world signed “An Open Letter to Scientific Publishers” (Ramachandran, 2004) calling for “the establishment of an online public library that would provide the full contents of the published record of research and scholarly discourse in medicine and the life sciences in a freely accessible, fully searchable, interlinked form”. This led to the establishment of the Public Library of Science, an advocacy organization. PLoS decided to become an open access publisher aiming to compete at the high quality end of the scientific spectrum with commercial publishers and other open access journals, which were beginning to flourish. The Budapest Open Access Initiative arose from a small but lively meeting convened in Budapest by the Open Society Institute (OSI) on December 1-2, 2001. The purpose of the meeting was to accelerate progress in the international effort to make research articles in all academic fields freely available on the internet. The initiative has been signed by the Budapest participants and a growing number of individuals and organizations from around the world who represent researchers, universities, laboratories, libraries, foundations, journals, publishers, learned societies, and kindred open-access initiatives (Chan et al., 2002). In 2003, the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities was drafted and the World Summit on the Information Society included open access in its Declaration of Principles and Plan of Action. During the same year IFLA declared the world-wide network of library and information services providing access to past, present and future scholarly literature and research documentation; ensures its preservation; assists users in discovery and use; and offers educational programs to enable users to develop lifelong literacies. In 2005, the world’s two largest funders of medical researchers, the United States National Institute of Health and the United Kingdom’s Wellcome Trust, adopted policies with, respectively, a recommendation and a requirement to provide open access to the results of successful grantees. Articles are to placed in a central medicine-specific repository, either the U.S. PubMed Central or a UK central repository, when this is available.

In order to support the OA publishing, governments of developed countries are already promoting such activities in their respective countries. The U.S. National Institute of Health Policy requested that researchers should place a copy of their article in PubMedCentral for secure archiving as well as Open Access, within 12 months of publication. The United Kingdom government’s Science and Technology Committee issued a report entitled *Scientific Publications: Free for All?*, recommending that results of all research funded by the United Kingdom government be made freely accessible in a network of institutional repositories across the United Kingdom. While the United Kingdom government has rejected the mandatory approach, the United Kingdom’s Joint Information Systems Committee, with the aim of providing a centralised and coordinated direction for furthering higher education in the United Kingdom, is already developing the institutional repository system, to be filled on a voluntary basis.

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#### 4. Types of OA

Popularly OA advocates two types of strategies for promoting the free availability of scholarly literature: self-archiving initiatives and open access journals. These two strategies are also known as “Green” and “Gold” roads to OA, respectively. A green publisher (or journal) has given green light to its author to self-archiving their papers (i.e make the research output open by depositing the full text on a toll free, publicly accessible web site). Initially, Self-archiving method creates confusion among commercial publisher but the majority of publishers now do permit authors to post their articles online in form of preprint (the version originally submitted to the journal) or post-print (the final, peer-reviewed and accepted but not yet edited version) or final version as prepared for publication or even the final published version with all its formatting (typically in PDF format). The permitted posting may be either author personal web sites, a departmental or other institutional websites, or organized institutional repositories or a subject based repositories. ArXiv, D-space, e-print, E-LIS are some of the example of these repositories.

In gold road OA publishers not only give the green light to both preprint and post-print self-archiving by the author, but the publishers themselves archive all their articles publicly on their web sites. There are three shades of OA journals: Delayed OA journals; Partial OA journals and purely OA journals. In Delayed OA, publisher makes their previous issues freely available after a period varying from few months to more than a year. Some times, a few publishers (Institute of Physics) makes article freely for few months and then goes for access control. Many publishers routinely make particularly important or noteworthy articles freely available to attract more readers to their journals. These are known as Partial OA journals. The Florida Entomological Society in 1994 and Entomological Society of America in 1995 first developed the idea. Some times, some publisher adopts these models with their trial version. Above all, the most popular model of OA is purely OA journal where author does not pay any charge to the publisher but the article is permanently made available to the journal web sites in its immediate issues. These journals get support either explicitly by grant funding or implicitly by subsidy from the institution, which pays the staff and provides infrastructure. Many institutions are now supporting this way of publishing because they realize that it is a solution to the problem of shrinking of the library budget and increasing cost of commercially published e-journal. As per the statistics 2004, less than 20% of journals listed by Directory of Open Access Journals (DOAJ) are author pay, 28% of journals listed in the DOAJ are free online version of print subscription journals. Societies, government institutions or universities typically subsidize the remaining titles.

Association of College and Research Libraries (2004) categorised OA e-journals with some different colour codes. They are:

1. **Open Access Journals (OA journals, color code: green) :** These journals provide free access to all articles and utilize a form of licensing that puts minimal restrictions on the use of articles, such as the Creative Commons Attribution License. Example: Biomedical Digital Libraries, Information Research.
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2. **Free Access Journals (FA journals, color code: cyan):** These journals provide free access to all articles and utilize a variety of copyright statements (e.g., the journal copyright statement may grant liberal educational copying provisions), but they do not use a Creative Commons Attribution License or similar license. Example: The Public-Access Computer Systems Review, D-Lib Magazine.
3. **Embargoed Access Journals (EA journals, color code: yellow):** These journals provide free access to all articles after a specified embargo period and typically utilize conventional copyright statements. Example: Learned Publishing, Libri.
4. **Partial Access journals (PA journals, color code: orange):** These journals provide free access to selected articles and typically utilize conventional copyright statements. Example: College & Research Libraries, Library Quarterly.

Very recently, John Willinsky (2005) has identified ten types of open access. This can be summarized in the below mentioned table.

<b>Types of open access</b>	<b>Economic models</b>	<b>Journal or portal example</b>
Home page	University department maintains home pages for individual faculty members on which they place their papers and make them freely available.	<a href="http://www.econ.ucsb.edu/~tedb/">http://www.econ.ucsb.edu/~tedb/</a>
E-print archive	An institution or academic subject area underwrites the hosting and maintenance of repository software, enabling members to self-archive published and unpublished materials.	arXiv.org E-Print Archive
Author fee	Author fees support immediate and complete access to open access journals (or, in some cases, to the individual articles for which fees were paid), with institutional and national memberships available to cover author fees.	BioMed Central
Subsidized	Subsidy from scholarly society, institution and/or government/foundation enables immediate and complete access to open access journal.	First Monday
Dual-mode	Subscriptions are collected for print edition and used to sustain both print edition and online open access edition.	Journal of Postgraduate Medicine

Delayed	Subscription fees are collected for print edition and immediate access to online edition, with open access provided to content after a period of time (e.g., six to twelve months).	New England Journal of Medicine
Partial Open	access is provided to a small selection of articles in each issue—serving as a marketing tool whereas access to the rest of the issue requires subscription.	Lancet
Per capita	Open access is offered to scholars and students in developing countries as a charitable contribution, with expense limited to registering institutions in an access management system.	HINARI
Indexing	Open access to bibliographic information and abstracts is provided as a government service or, for publishers, a marketing tool, often with links to pay per view for the full text of articles.	ScienceDirect
Cooperative	Member institutions (e.g., libraries, scholarly associations) contribute to support of open access journals and development of publishing resources.	German Academic Publishers

## 5. Models of Open Access

The OA phenomenon of e-publishing encompasses a range of publication models – mostly business models. One of the most common Business model is Author Pay model. In this new publishing model, instead of charging subscription fee from end user, OA journals either charge author or their sponsoring bodies, universities, governments etc. for publication. There are two principles of OA business model in market. First, the Public Library of Science (PLoS) is a low volume, high price author pay journals that competes with top quality journals like Nature, Science, Cell etc. Second, BioMed Central is high volume, low price publisher that, as ISI data show, competes with low impact journals. In a white paper posted on the PLoS web sites shows that the cost of publishing (processing and producing) an article in PLoS Biology is \$1069. They also charge \$1500 for publication of an article. BioMed Central (BMC) OA programme predates

the establishment of PLoS. BMC journals author are charged fees ranging from \$525 to \$1500 depending upon the journal. In an another alternatives, BMC provides “institutional membership” which allow their author to publish article without charging fee; however, membership fee is recalculated annually based on the number of articles that authors from that institution published during previous year. Oxford University Press charged \$208 for each pages in excess of nine pages and the online institutional subscription price is \$2459 for their journal Nucleic Acids Research. There is also another author-pay model existing in OA electronic publication. David Prosser has advocated this as Hybrid Model. Through this model American Physical Society (APS) charges \$1500 to permit the immediate release of their content but in a different case author has to pay no charges, and the article is made freely available after 12 months.

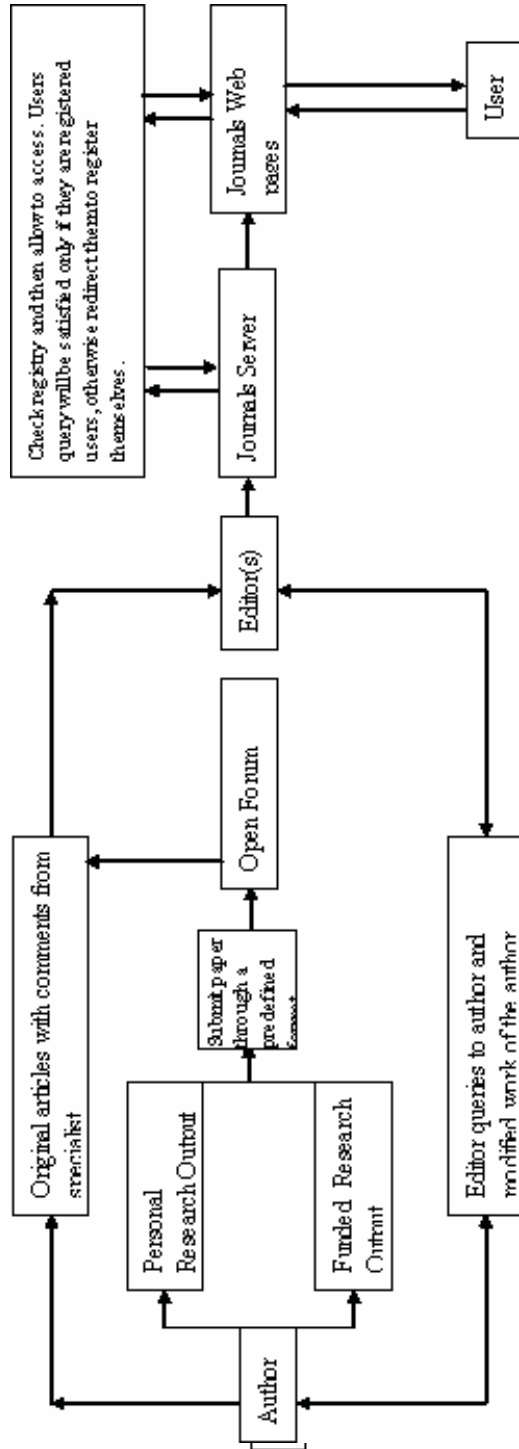
Commercial publishers are also adopting various models to respond to the OA movement. For instance, Elsevier, John Hopkins University Press and other commercial publishers allow for posting of the author final version of the manuscript in personal or institutional web sites provided there is a link to the journal home page or the articles DOI and a complete citation. In an initiative Springer’s “Open Choice” programme gives author the option to pay \$3000 for publication openly accessible via Internet.

However, in author-pay model actual production costs are much higher than fee collected. It has estimated that there may be a gap between what articles cost to produce and what author pays. This gap could be as high as \$1500-\$2500 per article depending on publisher. This implies annual industry-wide government, universities and/or foundation subsidies of as much as \$1.8 – 3 billion could be required to prop up today’s author-pay models. Another problem with these models is that in most of the countries there is still no such provision in the institutions budget to pay fees on behalf of their researcher for publication of their findings. This problem is again very realistic where multiple author from globally dispersed institution typically contribute to a single article. In some cases author’s institutions or funding agency agrees to pay, in other they might not. In an author pay model Welcome Trust suggests introducing submission fee in addition to publication fees. Because many submission are not accepted after initial review and the rejected authors would contribute 62% of total cost for good-to-high quality journals; they could contribute 17% for medium quality ones. This model is effectively a shift from author-pay to also rejected author pay. Again, this model would require major changes in author’s willingness to pay not only publication fee but also submission fee as well.

Most of the OA models as discussed above, offer various forms of author charging and mostly deals with the financial aspect of OA e-journal publishing. One possible objection is that the very term “author-pay” is problematic, since practically no author is willing to pay for publication from their own pocket; instead they would write for their sponsoring bodies for financial assistance. So there is a need to understand a different approach. Additionally, some other issues like archiving of OA materials for a long time, peer-reviewing of articles, source of finance etc. has not been discussed in these models. On the basis of existing policies and practices, we therefore, propose a model that deals all such issues relating to OA publications. This model to some extent is influenced by the concept propounded by Harnad (1990).

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A proposed model of Open Access



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## 5.1 Functioning of Model

In our model, author(s) needs to submit his research output to an Open Forum for getting comments from the subject specialist before final submission to editor. Generally, researchers conduct their research either by spending his own pocket money or getting fund from some Governmental agencies. All the research output will be submitted by the author to the Open Forum in a pre-defined format or screens maintained by the authority of the Journal. Open Forum will consist of group of registered subject specialists. They will be allowed to comment on the submitted papers before reviewing. Author(s) can choose up to five subject specialists from the address list for getting comments. Subject specialists will submit their comments in a specially developed comment screen without altering original article within 15-20 days from the date of submission of article. These comments would help authors make necessary changes and helped them to improve the structure and clarity of their analyses and conclusions. After getting comments from the subject specialists, author(s) will redirect his original research findings to the editor along with the comments of the subject specialists. Editors will consider the original work along with the comments made by specialists. By this way the task of the editors will be easy as well as transparent. After reviewing they will instruct author for modifications, if needed within 30-45 days from the date of receiving of article or initially reject the paper, if not satisfactory. Authors, after incorporating all necessary modification submit their paper within next 15-20 days to the Editorial Board for typesetting or converting text into the HTML/XML and PDF format. This may takes 30 days. After completion of all pre-requisite formalities full text of the article will be hooked to the authority controlled journal's server. Subsequently there will be publicly accessible journal's web page where metadata elements like title, author(s), DOI, volume number, issue number, informative abstract will be available. This page will also bear a link to journal's server where original full-text article has been kept permanently but user can only access the full article if he fulfills authentication. For fulfilling authentication, a user needs to register themselves in the journal host by accepting terms and conditions as laid down by the host and providing some basic information including e-mail IDs. This will enable the system to measure the citation pattern of any article as well as direct plagiarism. The full text of the article in HTML/XML format as well as its PDF version will be kept in journals server permanently but in journal's web page link towards full text article will be provided for 3 years for open access and then dropped. One can get all such titles by paying money. Recent articles in PDF format as well as all back issues in PDF format can also be available by paying. The authority, understanding its citation impact will decide the cost. The frequency of the journals will be quarterly.

## 5.2 Financial Issues

Managing finance for a viable OA publishing is always a questionable issue even for this model too. For surviving every OA need cooperation and active association from learned association, universities or governments. This model also demands this type of association. In this model, one may not pay anything for a research output of a personally managed research. But authors of a funded research project can pay a

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substantial amount to the journal as publication fee. Because it is the moral duty of authors to intimate all about the findings of the their research what they conducted by getting assistance from the government agencies. Government agencies also release this money that they collected in form of taxes from common people. The initial expenditure for establishing such configured system can be managed from the sponsorship or getting assistance from the respective government as well as learned institutions, universities etc. The editorial fees can be collected from advertisement or selling the post-print PDF version selling back issues. Another option of managing finance is selling the e-mail IDs of the registered users as it is used for scholarship not for gaining money. Users will be duly informed this issue during registration. In the initial stage creation of such system may not appear to be very eye-catching, but if the journals establish reputation automatically this venture will be a successful project.

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