Open Access Hybrid Journals

V. M. Moskovkin
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Abstract—The problem of the creation and operation of hybrid scientific open access journals, which first appeared ten years ago, is considered. This paper suggests an algorithm for calculating the cost of a sponsored article at each time step, which shows that if the value of a subscription is equal to the quantity of sponsored articles, then the cost of a sponsored article is equal to the subscription cost.

Key words: hybrid scientific journal, open access, electronic editions, subscription cost.

Online open access journals that have no paper versions began to be actively created along side of traditional printed journals at the end of the 1990s and the beginning of the 21st century, owing to the launching of an international movement for open access to scientific and humanitarian knowledge. The Directory of Open Journals (DOAJ), which is kept by Lund University (Switzerland) numbered 3386 journals as of the end of May, 2008 (the search for full-text articles is open for 1160 journals, their total number is equal to 187 432) (http://www.doaj.org).

Traditional journals also began joining this movement. The idea appeared of creating hybrid open-access journals (hybrid OA journals), in which only some of the articles are in open access, and the remaining articles are paid (to be more exact, they are paid for by universities and scientific organizations), as they are distributed through the usual type of subscriptions.

This scheme was suggested for the first time in 1998 and examined in the Florida Journal of Entomology by Walker [1]. It was extended to other journals of the Entomological Society of America. Later, this idea was developed by David Prosser in 2003 for the journal Learned Publishing [2]. Finally, this hybrid model came to be named the Walker–Prosser model for open access journals. Various publishers using this model call it by different names (Table). For example, Elsevier, the world's largest publishing house, suggests the option of sponsored non-subscription access to individual articles to authors: the cost of a sponsored article is $3000 and open access to it through the ScienceDirect platform is free for readers.

Another large publishing house, Springer, suggests that authors should make their articles completely available in exchange for an article processing charge. This is the so-called Open Choice Model. In this case authors do not transfer rights to the Springer publishing house. The cost paid by an author, his institute, or financing agency (a cost included in a grant) is $3000 for one article.

The John Wiley and Sons publishing house calls this scheme the Funded Access Model and charges the same $3000 (see table).

The OAD Directory (Open Access Directory, http://oad.simmons.edu/oadwiki/Main_Page) as of the end of May, 2008 presents 24 publishing houses that have OA options. As the table shows, the price for the use of OA options is approximately $3000; however, it is 2–3 times lower for the publishing houses of various scientific communities.

Special notations that permit one to find the full-text pdf-files of articles through hyperlinks are given for OA articles in the journals themselves. The publication of OA articles is performed through special online publishing platforms: the ScienceDirect platform for the Elsevier publishing house, SpringerLink for the Springer Science publishing house, WileyInterScience for the John Wiley and Sons publishing house, BlackwellSynergy for Blackwell Publishing, etc.

To avoid potential conflicts that are connected with the financial incentive for editorial boards to accept weak works for publication, the acceptance of the OA option is permitted only after a positive review and acceptance of an article for publication.

David Prosser (the director of SPARC Europe) describes the following problems that are connected with hybrid OA journals [2]:

(1) many authors are not able to pay for publications in such journals;

(2) if a journal is in open access on the Internet, many subscribers (if not all) can choose not to subscribe;

(3) proprietors (publishers) do not have sufficient resources to provide a journal during the transitional period to the majority of authors who are ready to pay for their publications (in our opinion, this is irrelevant

Table 1. Open access options used by the world's largest publishing houses

A publishing house	The name of an OA option	The quantity of published journals/the quantity of journals using OA options	The cost of using an OA option, USD	Notes
Elsevier	Sponsored Articles	2000/44	3000	An OA option relates to selected journals of natural science profile (physics, chemistry, mathematics, and computer sciences, life sciences
Springer	Open Choice	1900*/–	3000	When an OA option is chosen, authors do not transfer rights to a publishing house and can immediately put articles in an OA repository (embargo is absent)
John Wiley and Sons, Inc.	Funded Access	1400**/45	3000	An OA option relates to 45 journals of the biomedical profile. Putting articles in the OA repositories of financing agencies is permitted, but it is forbidden to put them in institutional OA repositories. Reviews are not permitted
Taylor and Francis	Open Access	1000/234	3250	There is no embargo on placing articles in an OA repository after using an OA option (payment of a publication)
Blackwell Publishing	Online Open	805/–	2600 + VAT	Payment must be executed within 30 days by means of a credit card. Authors are permitted to put articles in any OA repository (sites or servers) immediately after publication; a publishing house puts a published article in PubMedCentral.
Oxford University Press	Oxford Open	230/60	1500 for authors and institutes–subscribers	In the event that an institute is not a subscriber to a journal, the cost for choosing an OA option increases two times. The cost is two times smaller for scientists from developing countries
Cambridge University Press	Cambridge Open Option	200/15	2700	After publishing an OA article, authors can immediately self-archive their post-script (the final version of an author's manuscript after reviewing and removing notes) with corresponding references and attributes of author's copyright. There is no embargo on placing an article in an OA repository after using an OA option

  * Obviously, taking into consideration merging with other publishing companies (for example, with Wolters Kluwer.).
** After merging with Blackwell Publishing in February, 2007.
The mark "–" signifies the absence of information about the quantity of journals using an OA option on corresponding sites of publishing houses (it should be supposed that this option is applicable to all journals).

to the above-mentioned journals of publishing houses such as Elsevier and Springer; moreover, it is possible to provide reprints of a journal instead of the entire journal, as was customary by tradition).

If the number of authors wishing to pay for open access to their articles increases, the subscription cost of a journal will decrease; if such authors are fewer in some year, the cost will return to its previous value to cover all publishing expenses. In our opinion, the above-described process can be described by a mathematical model, based on which the adaptable management of a hybrid OA journal can be realized.

The disadvantages of the hybrid scheme are as follows [2]:

—a journal is divided into separate conditions of access for various articles (but if authors exert pressure on financing agencies for the purpose of provision with grants, this will compensate for the above-indicated disadvantage);

—it is probable that libraries will begin to turn down their subscribers if a considerable number of the articles are in open access, even if the subscription cost proportionally decreases;

—if the subscription cost is calculated based on a previous year, there is a risk that this will lead to a reduction in profit if the share of authors wishing to pay for their articles decreases;

When this model is created, four scenarios are possible [2]:

(1) A total lack of authors wishing to pay for open access to their articles (the traditional model).

(2) A low use rate, where 20% of all authors are ready to pay for this access. In this case subscription would cover the greater part of the expenditures for a journal. As time goes by, the subscription cost persists at the previous level or weakly decreases. A small number of articles are in open access. The publisher begins

to compare changes in the use and citation of articles that are in open and closed access.

(3) A medium use rate, where 20–80% of authors are ready to pay for this access. In this case the subscription cost will decrease more quickly. A publisher shows great interest in the comparative statistics on the use and citation of articles.

(4) A high use rate, where more than 80% of all authors are ready to pay for this access. In this case author's payments cover online publication costs.

In the latter case, where all authors are ready to pay for their articles, we come to an online open access journal that need not issue a paper version.

Consequently, the above-indicated scenarios described in work [2] actually show the gradual process of transition from a traditional journal to a purely online journal. One should have in mind that the primary costs of an online journal are much smaller than that for a paper journal.

When the hybrid model is considered, the question arises as to why commercial publishers, and moreover, the richest publishers, such as Elsevier and Springer, charge $3000 for a sponsored article.

It seems somewhat strange that scientists who are, properly speaking, people of modest means, sponsor the largest commercial publishing houses, the annual profits of which amount to hundreds millions of United States dollars. Publishers do not explain where the figure of $3000 comes from, they only say that they must cover costs connected with the publishing process, the placing of articles on a server, and their reviewing and distribution, pointing out that the expenses connected with the production of a printed version are not included in this cost.

But one can suppose that this cost constitutes some average cost of annual subscription to journals (an average cost for an entire or incomplete sample of journals or a cost with some margin with consideration for the trend towards growth of subscription). In actual fact, the high-impact journals of the largest commercial publishers have costs of annual subscriptions that are much higher than $3000 (for example, the journal Advanced Drug Delivery Review, with an impact factor of 7.977 (2006), which is published by the Elsevier publishing house has an annual subscription cost of $5454 for libraries in all countries, except the European countries, Japan, and Iran.

It ought to be noted that the annual subscription costs of the first-rate commercial publishers are two–three times overpriced, as follows from the journal Declarations of Independence (with a process of transition to publishers that are more friendly to the OA movement and less expensive, which was initiated by the editors of such journals). Consequently, one can suppose that, according to the logic of a publisher, each new sponsored article with instantaneous open access to it must lead to a decrease of journal subscriptions by one unit. But it is obvious that the small number of authors that chose the hybrid scheme exerts no influence on the decrease of subscribers at the initial stage of launching this scheme, and the publisher receives a profit that is not justified.

In our opinion, the cost of a sponsored article must be justified at each time step in the following way. Let the annual subscription cost and circulation of a journal be equal to C_1 and N_1 in the first year of launching the hybrid scheme. It will be supposed that the journal has a quantity of articles M that does not vary in time. Let us suppose that the share of authors that chose the hybrid scheme is equal to α_1 in the first year of launching the hybrid scheme. Taking into consideration that this value is small at the beginning of the new scheme and that the considered process is inertial, one should assign the minimal cost of a sponsored article at the first step (P_1), having limited it to the expenditures for reviewing and online publishing preparation of this article. In this case, the profit (D) of a publisher will be equal to $D_1 = C_1N_1 + \alpha_1MP_1$ at the first time step.

If the subscription to the journal does not fall at the second step, the same payment P_1 covering the expenditures for reviewing and online publishing preparation will be taken from the authors of sponsored articles. In the event that the subscription falls at the second step $(N_1 > N_2)$, it is logical to distribute the publisher's losses between all authors of sponsored articles, having calculated the new cost for a sponsored article from the balance relationship:

$$(N_1 - N_2)C_2 = \alpha_1MP_2, \text{ thus}$$

$$P_2 = (N_1 - N_2)C_2/\alpha_1M.$$

C_2 can be somewhat higher than C_1 owing to inflation, and the share of authors of sponsored articles is taken from its value at the first step (the process of delay in the calculation of α_1 by one step has place). At the 1st step, in the event that $N_i > N_{i+1}$, the cost of a sponsored article will be:

$$P_{i+1} = (N_i - N_{i+1})C_{i+1}/\alpha_1M.$$

This expression shows that if the value by which subscription has fallen $(N_i - N_{i+1})$, is equal to the quantity of sponsored articles (α_1M), then the cost of a sponsored article is equal to the subscription cost. It is a cost that is charged at present by commercial publishers of scientific periodicals without any justification.

Let us note in conclusion that the idea of using hybrid OA models can be very fruitful for previously existing Russian journals distributed by subscription, and it can be examined based on large Russian publishing houses, such as MAIK Nauka/Interperiodika, the publishing house of the Moscow State University, etc.

REFERENCES

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