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Opinion Serials crisis

Free publishing?

The advent of the internet has brought great changes to the practice of scientific research. In the September issue of the Nieuw Archief, Krzysztof Apt argued that free access to scientific literature is both desirable and economically feasible, and he signalled a growing number of initiatives in various forms of 'free publishing'. Michiel Kolman, Publishing Director, Mathematics & Computer Science of Elsevier Science, puts forth his view on how the internet will affect the future of scientific publishing.

Krzysztof Apt wrote an interesting article in *Nieuw Archief voor Wiskunde* as well as in the *Communications of the ACM* putting forward his personal view that the scientific community will benefit from a proliferation of free scientific journals. We are grateful for the opportunity to respond.

Free versus subscription-supported publishing

Elsevier Science welcomes new initiatives in the area of scientific publishing, including the so-called 'free' scientific journals. It keeps us on our toes, so to say. Some are indeed low cost and tailor-made solutions for specific segments of the science community. We feel we can learn from them, and their successes are inspirational. It should be noted that some of these community-inspired initiatives are thriving (like the Journal in in High-Energy Physics (JHEP) and the Journal of Artificial Intelligence Research (JAIR)), while others are not, and both the success stories and the disappointments are educational.

It is important to understand what free means in this context. The originators of free journals often do not take into account all the sources of support that they need to publish: their time, the time of any others who assist, the cost of equipment, office space and materiel, as well as the overhead of the institution they inhabit. Grants from foundations must be included here as well as any subsidies given to the operation. Together the monetary value of all these elements constitute the true cost of the operation.

It is also important to put the scale of these new initiatives in perspective: we are talking about a couple of dozen e-journals, which are typically small (on the order of 50 articles per year, with a few exceptions). Annually, over one million articles are published in about 12,000 peer-reviewed scholarly and academic journals worldwide. On average these journals contain 100 articles per annum. By comparison, Elsevier Science publishes 1400 journals, which corresponds to 200,000 articles annually. So-called free scientific journals serve a useful function but could they really replace all these traditional journals (from both society publishers and commercial publishers) considering the sheer size and thus scale of the operation involved?

Continuity and long-term archiving

Much of publishing involves voluntary work (for example, the referees, who play a crucial role, more often work for free than paid), but to have the publishing process solely rely on volunteers (as in the case of the so-called free science journals), is not realistic. It places many

important issues in the hands of the self-appointed volunteers alone. And it is the sole reliance on volunteers which has been the main culprit in the demise of most self-published journals historically and in the present. Of course, researchers can be very successful publishers (the publishing staff at the major publishers, all highly educated, many with PhDs, attest to that), but publishing is not their sole raison d'etre. Researchers expertise and priorities lie in the areas of scientific research, teaching and academic administration. It is the publishers professional expertise at creating the supportive environment in which editors and referees can function well, and concentration on operational and management issues that allows for the continuity of these journals. ("Editors can come and go, but the publishers stay".) The major publishers are stable while editors come and go as their interest change and they pursue changes in their academic career paths.

At Elsevier Science we are proud that we launched journals decades ago, that we invested heavily in these journals to make them a success, and that we continue to publish many high-quality journals today, also in Math and Computer Science. This would simply not have been possible with only community-supported volunteers, certainly not for 1400 journals, and it cannot be realistic for the whole scientific literature.

Professional publishing entails more than just the peer-review process and making the accepted articles available on-line, important as these two aspects may be. Archiving is crucial and all publishers agree that the information has to be stored in a medium independent format. At Elsevier Science we opted for a Standard Generalized Markup Language (SGML) repository, which now goes back to 1995. Community initiatives, almost without exception, fail to address this archiving issue. We invested heavily in our archive and are very busy expanding it back in time so that wherever possible our journals are available to volume one, issue one (some more than a century old). For our math program we hope to have the complete backfiles available on-line at the end of 2002.

Integration and interlinking of e-journals

Once the articles are made available electronically (and we mount them as PDF as well as HTML) the real work for the publisher starts: integration into a global network of knowledge. We have invested heavily to this end in our electronic platform, *ScienceDirect* [1], which today has unsurpassed functionality. Integration of the articles through linking both within one publishers output and between articles published by different publishers is crucial. We took the lead to work with other publishers in the *CrossRef* initiative [2], thus enabling readers to follow from the references to the referred article, irrespective of the cited publisher. This has been received with much enthusiasm by the scientific community and is used heavily. We will make all the archival articles also available with linkable references. Niche journals do not have the infrastructure provided by a major player in publishing and therefore they cannot benefit from the *CrossRef* initiative.

Distribution and accessibility of the e-journals

Distribution has been a sensitive point for all publishers (society, commercial and university presses) but even more so for commercial publishers. We witnessed the year-on-year decline in the number of subscribers and several years ago decided that this was no longer acceptable: we want our articles to be as widely available and cited as possible. To address this we first changed our pricing policy, committing ourselves to no more than single digit price increases in all our three major invoicing currencies. This has meant Elsevier absorbing all currency fluctuation risks as well as the extra costs of organic journal expansion. More importantly, we have been pursuing arrangements with our customers, individual institutional libraries and increasingly library consortia, whereby the library users have access to many of our journals (if not all) on the *ScienceDirect* platform even though the complete collection may not have been subscribed to in print.

Surely Krzysztof Apt is familiar with the UKB arrangement in the Netherlands? Here, all university libraries plus the Royal Library have access to all Elsevier Science journals over the next five years. This definitely addresses the issue of distribution. We have seen the usage of the online material surge, not only of these journals already in the university's collection, but also of the previously unsubscribed material. The success of these sort of arrangement has resulted in vast availability of the *ScienceDirect* journals, an order of magnitude larger than the *ACM Digital Library* [3].

This also applies to the math and computer science journals that Elsevier Science publishes: all are available to everyone at a Dutch university. To address the issue of availability of articles submitted but not yet published, we launched a math preprint server [4], freely available for all. This has been well received with more than 200 preprints deposited within a week of the launch. Disclosing scientific information available on the Web has been made easier by another free service which Elsevier developed: a search engine geared towards scientists called SCIRUS [5]. The search area can be restricted to focussed searches in mathematics (or computer science).

To address the accessibility of our e-journals in Africa we have made a large collection of math, computer science and physics journals freely available to researchers in Africa; here we collaborate with the World Bank backed African Virtual University [6].

Let me stress again: we welcome new initiatives, we welcome the competition based on sound business models. But we also feel that the 'free' electronic journals fail to address several crucial areas, such as permanence, archiving, interlinking, etcetera. And while their model may work fine for one or two community-run journals per scientific discipline over the next couple of years, can it be scaled up to the whole literature forever? The literature serves an important function for its authors and readers, and providing this function reliably while adhering to common standards over the long term is where the major publishers come in.

References

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