

Unbundled Journals: Today and Tomorrow

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Publishers of scientific, technical, and medical literature will be aware of the recent proliferation of ways to publish online. Key components of these evolving systems are free back and current issues (BioMed Central, Public Library of Science, HighWire Press) and reduced subscription rates (SPARC). More “traditional” publishers offer discounted packages or, for individual titles, various subscriber options that may include print plus online, print alone, or online alone.

No one knows how all this will shake out. Or rather, some know that a new publishing model is upon us, and others are equally sure that the essentials of commercial publishing will remain unchanged. However, there is general agreement that the article—the thing that people actually read—will be the main online point of entry. The physical journal issue as a discrete collection of articles that must be subscribed to has no real online counterpart.

If it's true that unbundled access to articles (no print subscription required) is the way of the future, it may pay to look at the current landscape for signposts. There are now a variety of ways in which a journal can be unbundled—I count nine. These arise as artifacts of the stages of production (preprints, incremental publishing) and from a reassembly of journal components (electronic editions, online document delivery, virtual journals, e-journals, online databases, vertical portals, supplements). The following is a brief overview of these unbundled products.

1. Preprints or E-preints

I hesitate to call these a product, because in

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fact most standalone preprint servers don't charge for access. (For an exception, see the Social Sciences Research Network at www.ssrn.com, which includes preprints in accounting, economics, finance, and law.) The emphasis is usually on dissemination, not presentation, and often the disseminators are authors, not commercial publishers. There might be little in the way of value-added adornments (design, commentary), so access is free. Of course, preprints are sometimes a component of a broader online offering, such as a vertical portal, and these can charge for access.

Because preprint servers often rely on one person or a small internal staff rather than a commercial publisher, there is the danger that they will be unstable. Many are familiar with the Los Alamos e-print archive of the high-energy physics community that has been available since the middle of 1991. The archive has moved with its founder, Paul Ginsparg, to Cornell University. No one doubts that this innovative service will survive well into the future, but its move with its founder gives pause for thought. Permanence and stability may be best ensured by well-established organizational, even commercial, backing.

It's worth noting that commercial publishers have begun to recognize the importance of preprints and have launched their own free preprint servers. (See, for example, Elsevier Science's Mathematics Preprint server at www.mathpreprints.com.) Today, the rationale might be that such offerings allow a publisher to engage its constituents better. Tomorrow, the importance of preprints and their maintenance and the addition of value-added features might introduce a more commercial aspect.

An important development in how preprints are mounted is the Open Archives Initiative (www.openarchives.org). The initiative promotes a set of application-independent standards that will allow various preprint servers to present metadata consistently so that the entire Web can act as

a searchable library of preprints and digital content in general.

2. Incremental Publishing

Incremental publishing is an enhancement rather than a standalone product. Moving one step beyond e-prints in the traditional production process, the idea is to publish online articles that have been accepted for publication but have not been slated for a print issue yet. Incremental publishing is a means of reducing production lags because the constraints of a print-page budget are absent. The articles may or may not be copyedited, and access may be tied to a valid online or print subscription.

One example is *Science Express*, which provides advanced electronic publication of selected *Science* papers. The service also provides instructions for citing such online-only papers. *Nature* has announced a similar service—Advance Online Publication—for its collection of Nature Research Journals.

3. Electronic Editions

These duplicate, or nearly duplicate, the material presented in the print edition. Electronic editions may be sold as a standalone, typically at a discount off the print institutional rate, or as part of a package of online journals.

In previous years, there has been a lot of discussion about how electronic editions of science, technology, and medicine (STM) journals are the least interesting presentation, especially if presented as PDF files. The concern is that they do not take full advantage of the new online medium, in terms of linking, for example. This criticism, while true, appears to have faded and may cease altogether as cross-reference links become well established.

4. Online Document Delivery

Many publishers now offer the ability to purchase single articles via their online journal services. Whether this will cause large-scale cancellation of print or online

journal subscriptions remains to be seen.

The largest-scale experiment in single-article purchases by a library, working with a publisher, was the University of Michigan's Project PEAK, which partnered with Elsevier Science. Various pricing options were offered, but the main lesson, at least from a publisher's point of view, seems to be that customers appreciate the flexibility of picking and choosing articles. There is also substantial use of articles from nonsubscribed journals (see www.lib.umich.edu/retired/peak for general background information).

An aside: From the very beginning, the idea that online journals will experience greater-than-expected use has been a common refrain. Journals that went online early saw an increase in visibility and perhaps use. This makes perfect sense now, of course, but early on it seemed at odds with assumptions about research and the core journals that researchers use.

5. Virtual Journals

Virtual journals pick and choose according to some criteria from among many different existing journals. They are what you might call special, customized issues—a new product from previously published or soon-to-be-published material. Examples are the growing list of virtual journals offered by the American Institute of Physics (www.aip.org) and the newly launched Institute of Physics IoP Select (www.iop.org/Select).

6. E-journals

E-journals are simply journals that have no print counterpart. Cambridge University Press, for example, publishes *Expert Reviews in Molecular Medicine* (www.expertreviews.org), which is offered free and carries review articles, molecular models, animation, and discussion groups.

The challenges of e-journals are well known. In addition to the difficulties that new journals always face (no impact factors initially, poor name recognition), there can be a struggle for submissions because authors worry about archival stability, which often leads to inadequate and static content, which in turn means that the journal can't be priced properly. There is also the hurdle of the "intangibility" of the journal, which

further affects the level of submissions and subscriptions.

7. Online Databases

In such fields as astrophysics, genomics, and ecology, where datasets can be large and complex, it's easy to appreciate the value of having researchers worldwide contribute to and manipulate large amounts of data stored in a single online repository. An example is the Paleobiology Database, at flatpebble.nceas.ucsb.edu/public, which is supported by the National Center for Ecological Analysis and Synthesis. This growing online collection of data allows researchers to try different statistical recipes to do their research. A recently published study that used the data raises the radical possibility that species diversity might not have increased over time, as has long been assumed. (It's interesting to speculate that future paleontologists will primarily mine data, not rocks.)

Some believe that database publishing, or making available the tools for database manipulation, will be the next growth area in online publishing.

8. Vertical Portals

These offer a suite of features designed to foster a sense of community, a place where one can go to get a broad array of information. Vertical portals, or "knowledge environments", often offer at one site such things as preprints, conference information, latest news, book features, discussion forums, conference proceedings, databases, links and resources to other Web sites, classifieds, and so on. They appear to stretch the bounds (and perhaps the resources) of what conventional academic publishers do. A good example is *Science's* Signal Transduction Knowledge Environment, at stke.sciencemag.org.

I've seen only a few examples of the offering of vertical portals by academic commercial publishers (such as BioMedNet). Furthermore, many vertical portals appear to focus on non-STM disciplines.

There might be good reasons for those assertions, and I would be interested to learn whether readers agree with them. Is it mostly the nonprofits that have been able to experiment in this way?

Unbundled Journals continued

9. Online-Only Supplements

The American Academy of Pediatrics owns and publishes the journal *Pediatrics* (www.pediatrics.org). But it also offers *Pediatrics* electronic pages, which are online-only supplements to the print journal, and these are free to all. The print edition carries an additional table of contents for these supplemental articles and a 1000-word abstract of each article. The online supplement accomplishes two things: It allows the academy to publish quicker and to publish more, and it allows it to act in a public-service mode. The freely available supplement features international articles that focus on diseases prevalent overseas, for example, AIDS and tuberculosis. I understand that authors have not objected to their papers' being offered only online. In at least one case, an author actually requested this option.

Electronic STM publishing is in its infancy, and experimentation is in order. But if one accepts that it's the articles that matter, and not how they are packaged into a collection (journal), one may predict which experiments will fail. It's not a stretch to suggest that such things as electronic editions, virtual journals, e-journals, and vertical portals will be beside the point and therefore commercially unimportant. That might be true especially as search engines gain in sophistication. (It's interesting to note, for example, a recent addition to the Elsevier Science Home Page: Scirus, which is billed as "the search engine for science".)

But can it be that journal publishers are all on a one-way street and that selling articles (albeit with links in and out) is the final destination? Under a personal hypothesis that debate on the future of STM publishing has abated, I recently tried (unscientifically) to measure the number of monthly postings of a particular listserv over time. I found that there is more debate than ever. It's good to know that things will remain interesting for some time yet. I encourage readers to send me their thoughts at aberim@cup.org. 