Building an Academic Community around the Journal: a glimpse of the future

John Cox

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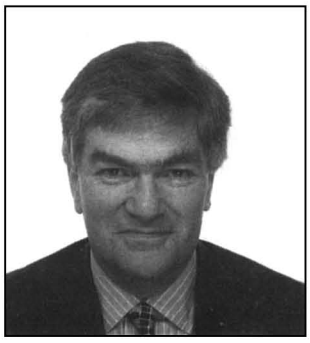
The electronic content business is changing scholarly publishing. Does the traditional journal meet academic expectations? If not, what is needed? How can preservation and access by maintained if the publishing process is being re-engineered?



John Cox is an international publishing consultant
E-mail:
John.E.Cox@btinternet.com

The scholarly environment

Scholarly publishing is undergoing a transformation that will leave none of us untouched. It used to be uncomplicated, driven by the need of scholars and researchers to publish. It was conducted in print. The resulting books and journals were affordable. Published scholarly information was readily available to its specialist readership.

Today, it is much more complex. Twice as many papers are published per year than twenty years ago. There are more journals and monographs published than ever before, at much higher prices in real terms. The numbers of copies in circulation are lower as rising prices have led to cancellations, so that ready access can no longer be guaranteed. Moreover, modern technology enables us to develop new ways of distributing scholarly literature with facilities and qualities that cannot be replicated in print.

Higher education itself is changing. After two decades of expansion, the funding environment has changed. The expectations of customers – students – are changing, as more adults seek qualifications and the demand for lifelong or continuing education and off-campus study increases. Universities have imported some of the techniques of the business world; many now have mission statements that include such ideas as learner-focused programmes, customised personal learning, distance learning, linked programmes and flexible delivery. They market themselves to their customers. They compete with each other. And many now expect their faculty to be entrepreneurs as well.

The electronic content business in the UK

We are a part of the knowledge-based economy, which encompasses publishing, media, software, database, education and financial communities. While the on-line industry in all its forms is strongest in the USA, in the UK it is surprisingly strong. It has

grown from revenues of £1.2 billion in 1988 to £4.4 billion in 1998. It employs 30,000 people, of whom half are based outside the UK; this industry is truly global.

Of the £4.4 billion, £3 billion comes from on-line services to the business and financial markets, £1 billion from advertising and transaction-based activity, with the remainder from off-line products. Geographically, £1.3 billion comes from the UK, £1.3 billion from the rest of Europe, £1.1 billion from North America, and £700 million from the rest of the world. Content can be categorized as financial (43%), news (27%), business (16%) and 14 per cent falling outside these broad classifications.

Does the traditional journal meet academic expectations any more?

The academy is restless. The printed journal serves as part of the certification process and provides a permanent record of research and scholarship that is fixed and authoritative. But paper-based publishing cannot readily meet the demands now being placed upon it:

- Universities today need to provide access to literature not only for faculty and students on campus, but also for distance learners, alumni, and for third party staff with whom the university may be working.
- Consortia are negotiating multi-institution licences that explicitly provide for 'bulk' prices, performance standards and archiving requirements. Member institutions need to share their resources across many sites.
- Budgets no longer allow for coherent collection management other than on a cooperative, multi-institutional basis. Some libraries are capping expenditure with certain publishers seen as unduly expensive or unfriendly to libraries.
- Increasing professional and research specialization has led to greater complexity. It has outpaced human ability to assimilate information in traditional forms. While technology is important only because of its relationship with the underlying requirements of scholarly communication, it provides the means to deal with such complexity.
- It no longer meets the changing needs of academic research in many disciplines. The traditional assignment of authors' copyright is under challenge at Caltech and Johns Hopkins. Indeed, some academics believe that certification of scholarship should be decoupled from publication because of technological changes.

There is a growing perception that the academic community is being exploited by publishers who no longer meet their needs as authors or readers. Universities are demanding affordable prices, an increasing role for universities and societies in the publishing process and a new deal on intellectual property. They are asserting their buying power, and will by-pass publishers who do not respond.

These controversies are merely symptoms of the breakdown of traditional scholarly publishing. They have even made the Press:

- An article in the *New York Times* on 8 December 1998 entitled 'Soaring journal prices spur a revolt in scientific publishing' described SPARC, the Scholarly Publishing and Academic Resources Coalition (http://www.arl.org/sparc). It is a group of 114 libraries that encourage the start of new, low-cost journals by undertaking to subscribe to them. One example is *PhysChemComm*, an electronic journal from the Royal Society of Chemistry that will sell for $350 and compete directly with Elsevier's *Chemical Physics Letters*, which costs over $8,000.
- *The Guardian* of 2 January printed a long and angry piece about authors' copyright and on-line publishing.

What do scholars and researchers need?

Thirty years ago, when I started my publishing career, we all talked of the 'invisible college', the group of scholars, wherever they were based, who shared a common research interest. They communicated by letter and telephone. The formal results of scholarship were published in printed journals and monographs. Then the telex and, in the mid-1980s, the fax arrived to speed up the process of communication. E-mail and the Web are creatures of this decade, but have truly transformed communication. The invisible college has become visible and identifiable. And it expects information and communication products to confer similar benefits to those they obtain from the Web.

IT enables the busy researcher to communicate with his colleagues, analyse data using complex visualisation tools and marshal a wide range of resources from the desktop. The formal journal literature is only a small part of this, but has the potential to form the centrepiece of community information services.

Researchers are beginning to apply market thinking to their choice of information options:

- the capacity to influence the presentation and the content of information consumed;
- the personalisation of services;
- transparent access to a range of information sources;
- access regardless of location;
- interaction with colleagues in a collaborative environment.

The gap between their expectations and today's capacity to deliver is wide. For instance, the development of filtering mechanisms and the creation of metadata is still at an early stage. Nevertheless the gap is closing.

What is already happening?

There are already examples of content-based services to point the way in the future. Such 'content' is not confined to scholarly works, or even to publishing in its general sense. For instance, Reed Elsevier has developed *Lexis-Nexis* for the legal and business communities, *Air Transport Intelligence* for the travel business and *Estates Gazette Interactive* for the property market, as well as *Science Direct* for the academic community.

Some developments within the scholarly world include:

- *Science* is 118 years old. It has a weekly circulation of 158,000 and an annual turnover of $40 million. *Science* has been available on-line with HighWire since 1995. *Science* has now launched two Web sites: *ScienceNOW* for news and *ScienceNEXT WAVE*, a science graduate career development sites. Expanding its on-line presence is a juggling act, as on-line products generate less than $1 million per year, so great care is taken not to jeopardize print or advertising revenues. A complex pattern of on-line pricing segments the market into print, print and on-line, on-line only, society and national licences, and pay-per-view. Parts of the *Science* Web site are free, but registration is encouraged, which appears to generate print subscriptions. *Science* believes that this will lead to a 'knowledge environment' with the appropriate tools, visuals and content.
- *Perseus* (http://www.perseus.tufts.edu), a digital library of the classics, has shown how limited and relatively inaccessible print on paper is compared with an electronic environment that allows scholars to analyze documents with complex visualization tools.
- *Stoa* (http://www.stoa.org) is an electronic publishing system for refereed scholarship in the humanities for access by wide public audiences. Such an initiative adds to the pressure to break the link between publication and certification for tenure.
- *ChemWeb* (http://www.chemweb.org) features a library of chemical journals, databases containing abstracts, chemical structures and patents, a 'shopping mall' for software, equipment and books, a jobs page, a conference diary, a searchable and reviewed database of resources on the Web, and Available Chemicals Directory from MDL.
- *BioMedNet* (http://www.biomednet.com) contains similar features for the medical and biosciences: MEDLINE, an online magazine, a job exchange, a database of relevant Web sites, a bookshop and 100 journals from which articles may be purchased.
- *LANL*, the Los Alamos pre-print server, has shown how popular these services are; it has generated 93,000 submissions since August 1991, and attracts over 500,000 connections per week.

The need for lateral thinking

We may be in the early days of the electronic revolution, but experience has already demonstrated that traditional publishing ideas and processes need rethinking. Electronic publishing can add new value to publishing activities, including broader content, new resources, speed, linking mechanisms, cost reductions, new buying points and more flexible business models.

Creating these new values is far more important than worrying about the technology. In the serials community we have spent years arguing about the merits of competing electronic publishing technologies: PDF, HTML, *RealPage*, SGML etc. We have spent so much time – most of it wasted – that we have all neglected the strategic management issues underlying the transition to an electronic publishing environment. At least one Internet publishing services company, CatchWord, has recognised this by announcing its intention to output its publishers' journals in any format they choose, including *RealPage*, PDF, XML, as well as VML, PGML and SVG. The reader can have whatever he or his institution require. What really matters is how information products and services are put together and delivered.

Customer service and feedback becomes vital. Content providers must understand the context in which content is used and what further information is needed in order to add value to the customer's activities and decision-making. We need new skills in knowledge management, to provide information filtering, customer profiling, seller qualification and knowledge sharing. Context (not technology) is king!

E-commerce is not the same as e-business. Amazon.com is an example of e-commerce. But e-business is not just about buying and selling; it marries content and context, as emerging academic community information services show. At a recent conference, Nigel Stapleton, Joint Chief Executive of Reed Elsevier, illustrated the distinction as follows:

E-commerce	*E-business*
Transaction oriented	Customer management oriented
Cost-based (i.e. cost reduction)	Revenue-based (i.e. revenue growth)
Disintermediated	Re-intermediated

It is clear that the importance of context drives producers to manage customer needs and meet them with effective customized information systems and products.

Publishers, with their tradition of producing and handling static and inflexible print products, will not find that easy. And the role of librarians in a re-intermediated e-business that appears to flow directly from producer to consumer is no clearer.

How is this all to be paid for remains an unanswered question. It certainly involves a crucial marketing issue: what may be provided free of charge, and what should be accessible only to paid subscribers. Part of the Web culture is that information is free; the boundary between 'academic/research-friendly' linking, indexing, pointing to other resources etc., and the core journal content for which payment is required needs to be established. The entry level, containing news, conference details, notice board, job exchange etc., would be available free of charge. Deeper levels would require payment, depending on the nature of the information being accessed.

Preservation and access

IT may bring opportunity, but it also creates challenges such as name and version control, document integrity, authentication and preservation. I want to comment on two issues related to the location of on-line literature, and access to such literature as part of the eternal scholarly record.

First, finding what you want. Most researchers use a variety of tools to find the information they need, usually provided by the library. But they use on-line databases rather than the library OPAC for their literature searches, simply because the OPAC contains, at best, patchy information on electronic resources. Libraries now need current and accurate information on, and links to, their on-line publications for the OPAC. Publishers must help libraries to maintain their effectiveness in serving their customers, or the orderly communication of information from author to reader, via the publisher and the library, will start to crumble.

Secondly, preservation. Historically, university libraries, many of which date back to the Middle Ages, have taken responsibility for archiving the scholarly record. The electronic environment complicates matters. Moreover, 'archiving' is not a consistent concept applied by libraries throughout the world.

We need to be clear about what needs to be archived. What will be needed by future

generations? Scholarly papers and monographs in printed form present a coherent and self-defining group. But behind the formal quality controlled publishing environment there lies a range of material that is available electronically and that is growing in importance. It includes critiques, 'debates' and conferences facilitated by the Internet, links to relevant third party resources, and other exchanges between scholars as well as grey literature, raw data, and the working papers and notebooks that scientists and scholars have always compiled. Where do we draw the line? What do the archivists say? They have been very quiet!

To me as a publisher, the archive becomes an issue:

- when it exists only in electronic form - if it is published both in printed and electronic form, a traditional archival format is already made available – and
- if it has ceased to be available from conventional sources through a publisher or aggregator.

Given the small communities of researchers to which each individual archive may be relevant, and the efficiency of technology, maybe only one archive copy will be needed, probably in the country of origin of publication. This has to be done on an agreed and collective basis and points to a role for national libraries analogous to their responsibility for legal deposit in the print domain.

Re-engineering the publishing process

Publishers make products out of ideas. They must demonstrate the value their processes add to the output of scholarship, especially in managing quality and presentation, and in marketing, distribution and subscription management. They need to explain more, to be more responsive to customers, and to be more collegial with each other and with the academy.

Publishers must become more adept in copyright and licensing management. While the future of copyright law itself remains unsettled, it will be influenced more by the entertainment and music industries than the scholarly community. But universities are now asserting control over copyright, as they already do over patents. Ways must be found to manage issues of both authors' and users' rights to facilitate the widest access to material consistent with maintaining the integrity of the product.

A great deal of work is needed in structuring information and designing formats for electronic publishing. Every publisher needs to be involved in developing standards such as the DOI, and in the economic and cultural issue of archiving.

There needs to be a change in publishing culture. The urge to compete must be tempered by cooperation, partnerships and alliances. Scholars need access to a single coherent and complete corpus of literature; publishers have to accept that they must work together to provide their electronic content, often associated with secondary databases, through a single point of access. The challenge is to maintain the authority and integrity of the individual journal or monograph, and the associated revenue, while providing simple, uncluttered access to readers.