

A System of Electronic Journals for the United Kingdom

For some twenty years, people have been saying that the electronic scholarly journal was imminent and that it would largely replace print-on-paper journals. There are two main reasons why this has not yet happened: limitations of the technology, which have only recently been overcome, and the commitment of current journal publishers to print-on-paper, in which they have a large investment. These have so far counterbalanced the probable economies to be gained; the question of relative convenience is more debatable. A number of journals, most notably those produced by the American Chemical Society, are available on-line as well as in printed form; but until this year there was no serious academic journal which was primarily electronic, though there have been experiments designed to test its technical feasibility. However, there are at least two events which make it clear that the situation is changing.

One is the advent of the first purely electronic journal which is more than an experiment. This is *Clinical Trials*, which started in February 1992 and is sponsored by AAAS and OCLC. The fact that its annual subscription is \$95, which covers unlimited access and full down-loading rights, demonstrates how great the economic advantages of an electronic journal can be. If this journal is a commercial and academic success, it is the intention of AAAS and OCLC that it should be followed by a range of journals covering all scientific subjects.

The second is the creation of very large databases of journal articles available on networks throughout the United States. One of the largest of these is the CARL database; this already contains 2,000,000 articles derived from 12,000 journals, and it is growing at a rate of 600,000 articles each year.

Peter Swinnerton-Dyer
Sheffield Polytechnic

These are held as page images, rather than as a character stream, primarily because if one starts from print-on-paper it is easier to create them in this form. An advantage of page images is that they can be delivered to any fax machine, rather than needing a computer terminal; disadvantages include the greater transmission cost and the fact that they cannot be electronically searched or processed. But, in a world in which most scholarly articles are generated in electronic form (on a word processor) in the first place, it must be economically ludicrous to turn them into print-on-paper and then back into an electronic image because the latter is more accessible.

The nature of an electronic journal

Throughout this document, an electronic journal will mean a properly refereed scholarly journal with adequate archiving facilities. For the success of an electronic journal, it is essential that an article published in it should have the same status as an article published in a refereed print-on-paper journal; but if the refereeing standards are comparable there is no reason why this should not be so. Because an electronic journal is really a database, it will not be broken up into parts in the way that a print-on-paper journal is; this means that it does not have size constraints and that an article becomes available to readers as soon as it has been accepted by the Editorial Board.

From the point of view of an author, the only major difference apart from the greater speed of publication is that an article would be submitted in electronic rather than

typewritten form — ideally, using JANET or its equivalent in other advanced countries. Articles could however be submitted on floppy disc through the post and a substantial proportion of them probably would be. An article would naturally be sent on to referees electronically, though of course they could be sent print-outs by post if that were more convenient. A reader would browse at the screen of his computer terminal, and could obtain hard-copy printouts of any article that interested him sufficiently. (There is still one important technological limitation in that this medium cannot yet cope with half-tone photographs though it is perfectly satisfactory for diagrams: this means that there are some subjects in which an electronic journal will not be acceptable for a few years yet.)

It is also easy for a computer to turn a character stream into page-image form, so articles can be delivered through fax; the faxes obtained in this way are very clean because nearly all the noise in normal faxes is produced when scanning the original document. This is an important facility for potential readers not on JANET or any similar network; the effect is that an electronic journal would be easily accessible to workers in research laboratories and to academic staff in less advanced countries.

The economic advantages come from bypassing the cost of setting up articles in print and from no longer having to print a thousand copies of a journal in which a typical article does not have more than a dozen readers. There are also editorial economies because articles in a database do not have to have so uniform a printing style as articles in a print-on-paper journal. One must set against this the cost of maintaining the database and the proportionate share of the cost of the necessary network; but provided the latter exists for other reasons anyway these costs will be small compared to the savings — as is shown by the low cost of *Clinical Trials* compared to that of a typical medical journal. There is also an improvement in accessibility, for all universities and polytechnics in Great Britain are on JANET

(and higher education institutions in most other advanced countries are on networks linked to JANET) whereas most university libraries can nowadays afford to subscribe to only a very limited range of journals and have to obtain copies of others through inter-library loans.

The organization of an electronic journal

There are three pre-requisites or implementing an electronic journal:

- (i) An Editorial Board and refereeing system. This presents no new problems, being exactly the same as that which is needed for a print-on-paper journal.
- (ii) The hardware and management for maintaining the database. For reasons of economy, this ought to be embedded in an existing organisation. Moreover, each individual journal will correspond to a rather small database, its size being limited by the number of articles of satisfactory standard that are submitted. So it is much more sensible to think in terms of a whole family of electronic journals, covering between them a wide range of academic subjects, rather than a single one.
- (iii) The network, or highway, through which the potential reader accesses the database. This needs to be a pre-existing network, such as JANET or its successors; but in most advanced countries the higher education institutions are already connected by such a network, and the various networks in different countries are linked. However, not all potential readers have to be on such a network; access through fax is possible, as has been explained above.

A proposal for the United Kingdom

It is clear that at least one family of purely electronic journals, organized by AAAS and OCLC, will come into existence in the United

States in the fairly near future — and the journals produced by this means will be so much cheaper than print-on-paper ones that commercial publishers of the less-distinguished journals will be forced to follow suit or go out of business. (AAAS and OCLC are both not-for-profit organisations, but they are not interested in making a loss on any of their operations.) It would be disadvantageous to the United Kingdom if there were no comparable family of journals based here; and in fact, of all European countries the United Kingdom is the best place to base such a family. Because JANET and its successors are crucial, the involvement of the UFC and subsequently the HEFC is essential. The moral support of CVCP is also essential, but can be confidently expected; for the effect of this proposal should be a major reduction of journal costs in the medium term, and these are a significant part of the total cost of libraries.

There are three obvious candidates for a host for the database, of which the third seems to me the one involving fewest complications:

- (i) The British Library Document Supply Centre at Boston Spa, which already fulfils a large number of document requests from academic and research libraries, and which is exploring various possibilities for automating the process.
- (ii) The SERC Rutherford Laboratory, which is a principal node in the JANET network.
- (iii) BIDS, the Bath University Information and Data Service, which already acts as the agent of the Information Services Committee of the UFC in leasing various databases and then providing the academic community with access to them.

For most of the individual journals in the family it is likely that the appropriate learned society would be willing to take responsibility for the Editorial Board and refereeing system. But this is unlikely to be true of all of them,

and in any case there will be a need for an overarching body to take overall responsibility for academic matters — though not for managerial and financial ones. The natural candidate for this is the Royal Society — possibly in association with the Fellowship of Engineering and the British Academy, but there are advantages in having the responsibility vested in a single body.

Charging for access to databases involves standard technology and existing databases present many examples of how to do it. As for costing the proposal, it should be possible to estimate the expenditure fairly reliably: editorial costs should if anything be less than those of a print-on-paper journal, because the latter needs to spend so much on postage; and there is a good deal of experience of both the hardware and management costs of maintaining a database. What would be much harder would be to estimate the income which would be generated if one followed the standard database practice of charging for each access. The existing statistics on the number of readers of an average journal article are suspect, and do not take into account browsing; and a new medium might in any case change the habits of readers. The obvious way round this would be to charge an annual subscription, which would entitle the subscriber to an unlimited number of free accesses — which is what AAAS/OCLC have done with *Clinical Trials*. (But in contrast with their practice, I would envisage the typical subscriber as being a complete institution.) For organisations other than UK higher education institutions, this seems the best way to proceed; but for UK higher education institutions the way in which BIDS currently operates provides a more attractive alternative. This would be for the Information Services Committee to meet the cost of the operation, and for higher education institutions to receive the service without charge. In effect, this is what already happens with those outside databases for which BIDS buys access on behalf of the whole system.