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AN ESSAY IN MAKING A DREAM COME TRUE

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In January 1990, in a letter published in the Library Association Record, I described my dream of the future of document delivery. The dream "is of a research worker in a laboratory who is told by a colleague of a journal article in his field of research. He turns to the computer terminal on his desk and calls up the library system. He checks for holdings of the periodical concerned and selects a key which enables him to enter the reference to the article he requires. His request is transmitted via the network to the Library, where the article is either photocopied or downloaded from a compact disc or obtained via the interlibrary loan system, to be transmitted via the network or sent in the internal mail to the research worker in his department". In the letter I went on to explore, briefly, how we might be able to offer such a service to our users, partly using conventional technology, such as photocopying, and partly looking forward to the availability online of the full text of journal articles. There are two important differences between my dream and the present situation for most research workers: firstly, in my dream the research worker does not have to come to the library to obtain the journal article he requires, and secondly, document delivery is measured in minutes rather than in days. As I believe my dream represents the level of service we ought to be offering to our scientific and medical users, since writing that letter I have been exploring ways of making my dream come true. I have given this paper the title "An essay in making a dream come true", essay that is in the original meaning of an attempt or endeavor. What I shall describe is not a story of huge success but an honest attempt to grapple with the problems of scholarly communication.

I am continually surprised that our users are satisfied with such a poor system of scholarly communication and document delivery. Academics work long hours undertaking research and writing it up. From the publishers they receive very little for all the hard work they have put into their research, and yet the publishers make substantial profits by charging libraries extortionate subscription rates. These same academics are remarkably understanding when we explain that it will take a week to obtain a journal article on interlibrary loan because the high prices charged by publishers mean that we cannot afford to stock the journal they want in our own library. If the present system of scholarly communication offered a first class service in return for a high cost, then it could be justified. Or it could be justified if it offered a slow service at low cost. As it is, we have the worst of all situations: a poor service of document delivery at a high cost.

Some librarians have attempted to tackle this problem by putting pressure upon publishers to reduce their prices. I applaud the efforts of the Association of Research Libraries to publicize the profiteering practices of certain journal publishers and I welcome the flow of information on such matters through the electronic Newsletter on Serials Prices Issues. Within the United Kingdom, SCONUL is supporting these efforts as far as it is able. My own thinking, however, is based upon the assumption that, no matter how much publicity and how much pressure, the journal publishers are onto too much of a good thing to be willing to change their pricing policies. We have to look instead to major changes in the pattern of scholarly communication.

The key change will undoubtedly be the availability of the full text of journal articles in electronic format. The technical developments for such a change are already coming into place: the widespread availability of word processors, high-speed communication networks and high-density computer storage. The political developments are also already there in the background:

the pressure from funding institutions to publish research quickly, and the emphasis upon quality of publication rather than quantity of publication in determining academic status. Single-paper electronic publication will provide fast publication of research, the stamp of quality coming from the funding institution sponsoring the research or from a learned society. I do not necessarily see a major role for commercial publishers in this scenario, unless it is in providing the marketing skills which academic institutions often lack. Some commercial publishers may publish certain journals in electronic format but because of the cost of original research I foresee universities and other funding bodies wishing to handle the publication of research results themselves. The press conference called by the University of Utah to publicize the research by Professors Fleischman and Pons may be an extreme example but it is a sign of the times. You will understand that I see the change to electronic publication as being a desirable development, firstly because it keeps the publishing of research in the hands of the academic community rather than in the hands of commercial publishers and secondly because it will enable the fast and efficient document delivery system I described in my "dream". Once we have the full text of journal articles in electronic format, electronic delivery systems become feasible.

Despite all the potential advantage, I am aware that the switch to electronic publication will not be easy. My own institution, University College London, is at the leading edge of research in many disciplines and might be expected to benefit from a change to electronic publication. I have talked about this matter to a number of senior people in the College, and there is certainly agreement that such changes are likely and desirable. What seems to be lacking, however, is a catalyst, something to set the process of change in motion. The structure of scholarly communication is such a mammoth structure, trundling along well-established paths, that a powerful inertia-factor has to be overcome before changes can take place. Many influential people are talking about change, so I suspect that change will happen, but it will not happen overnight. I have also talked to a particular publisher about using the College computer to store the full text of particular journal articles which would then be accessible to journal subscribers on-line, providing a faster service than waiting for articles to appear in print. The publisher was willing in principle but felt that the benefits would be too long-term to warrant participation, even on the basis of funding with venture capital. And I have talked to a financial consultant with access to venture capital funding, again with a great deal of interest being shown, but at the end of the conversation being asked to produce a business plan for my proposal, at which point as a librarian, I am out of my depth. A friend of mine who is in business has offered to help me construct a business plan, but even with professional advice I can foresee great difficulty in selling an established paper journal in electronic format. The conclusion I reach from my essay into electronic publication is that many people see long-term changes as being inevitable and indeed desirable, but we need a few research institutions to take the plunge and get the process of change in motion. Once the change to electronic publication does begin, I believe that there will be a "snowball" effect and the pace of change will accelerate.

Although my own investigations into electronic publication have not produced any results, some people in the USA have been bold enough to initiate change. A number of new electronic journals have been set up with very respectable academic backing, and they are changing from being merely electronic notice-boards to being conveyors of research. A major conference on electronic publication was organized by the Faxon Institute earlier this year and it is clear that a great deal of experimentation is taking place. It appears that administratively it is relatively easy to set up a new electronic journal, particularly while the networks are free. The key to success appears to be to identify a community of users who are familiar with the networks and who would benefit from speed of publication. Such communities already exist amongst users of printed journals and we need to find a group prepared to switch the

publication of their research from paper to electronic format. The future may lie in creating new journals rather than converting existing paper journals to electronic publication. I have registered with one such electronic journal, which contains a mixture of short notices and refereed articles, and I have asked my academic colleagues at UCL to comment on the value to them of the material that is published in this electronic journal. Their reaction has been very positive and no doubt in due course they will register with the electronic journal themselves. That raises a question about the role of librarians in the age of electronic publishing. Will they be needed? While these electronic journals continue to be free or very cheap, individual academic staff will not need any library involvement. If the price of these journals rises above what in marketing terms would be called a key price, however, libraries will come into their own as the repositories of journals which are used by many people but which are too expensive for individuals to buy, as happens at present with conventional printed journals. Moreover, even while electronic journals remain very cheap, a library subscription will be necessary for students or other users who cannot register with the journal in person.

Another major role for librarians in the age of electronic publication will be document delivery. No academic is likely to be able to cope with the wide range of electronic information that will be available. He may have his personal subscription to one or two key electronic journals in his field, just as he has personal subscriptions to one or two paper journals now, but also as now he will rely upon the library for access to the broad range of literature. The key question for libraries will be whether they hold such electronic publications locally, or whether they act as intermediaries between the user and a remote electronic store. No doubt again, the present mixed situation will be replicated in electronic form. Some electronic journals will be held locally, as the paper versions are now, others will be held in a remote location and copies of particular articles downloaded to the user's terminal. I suspect, however, that the balance will shift away from local holdings towards remote access, and indeed we are already seeing this happen with paper journals as price increases force libraries to cancel their own subscription and rely upon other libraries.

In this scenario an efficient and cost-effective document delivery system will be essential. For the supply of paper copies of journal articles we do already have a document delivery system which is efficient and as cost-effective as it can be within the constraints of a manual system. The key component in the system for UK libraries and for many other libraries throughout the world is the British Library Document Supply Centre at Boston Spa. The success of that institution has been built upon the twin pillars of comprehensiveness and cheap mass-production. Its stock is as near comprehensive as any single library can be, ensuring a high success rate, and its techniques have been closer to those of a factory than to those of a library, ensuring as low a cost as is feasible. The twin pillars of comprehensive and cheap mass-production upon which Boston Spa is supported are, however, built upon shifting foundations, that is UK Government policy in relation to the funding of public bodies. The hidden subsidies tolerated in the document delivery system in the past are no longer tolerated by government. For example the cost of maintaining two copies of many publications, one in London and the other at Boston Spa, was tolerated in the past and enabled the Document Supply Centre to provide an immediate photocopying service from material on the spot. There is a real danger that the Document Supply Centre will lose its advantage of comprehensiveness. Moreover the excellent services provided from Boston Spa were only cost effective while those services provided a small fraction of the demand upon a particular library. We have been able to afford the cost of Boston Spa's services while the bulk of user needs were satisfied locally. For example, probably around 500 people per day come into UCL Library looking for journal articles. While 490 of those people find what they want locally and only ten

submit interlibrary loan requests, the services of the Document Supply Centre are cost effective, because they supply at a reasonable cost material for which there is a low demand locally. There is, however, no service available which can supply the bulk of the demand in any large research institution for document delivery. The mass supply of copies of journal articles to our users' desks is at present a dream. For most of their needs research staff and students have to come to the library and hope that the journal they want has not been canceled. To any library director who cares about the level of service to his or her users this cannot be a satisfactory state of affairs.

The difficulty we face in improving document delivery is partly financial, but also partly designing document delivery services which are radically different from those at present available. At the current cost of an interlibrary loan request in the United Kingdom, the satisfaction of all 500 daily visits to my library to consult journals by an interlibrary loan photocopy would cost the same as our entire periodicals budget. In financial terms, therefore, we are at break even point and in theory we could cancel all our periodical subscriptions and rely entirely upon interlibrary loan. In practice of course that decision would not lead to a better service to our users because of the time taken to obtain photocopies through the present interlibrary loan system. But the calculation does illustrate two points of principle: firstly that if interlibrary loan becomes relatively more expensive than it is now, the balance of advantage will shift towards subscribing to journals and away from obtaining interlibrary loans, and secondly that if we can devise a fast document delivery system at relatively less cost than at present, the balance of advantage will shift towards document delivery and away from journal subscriptions.

The only hope of making document delivery significantly faster and cheaper lies in the availability of full text in electronic format. My own Library, at University College London, was a test site for Adonis, which contained the full text of articles from biomedical journals on compact disc. I have written about the Adonis trial in an article in *IATUL Quarterly*, so I shall not repeat myself, except to say that I believe the compact disc format has a limited but valid place in the full text electronic market. The best hope for the future, however, must be in online storage of full text, as compact disc cannot cope with the large quantities of storage required for full text of a wide range of journals. The Computer Science Department at my College is currently loading the full text of American Chemical Society journals and once funding has been secured a pilot project will take place allowing library users access to the full text online. It will be a few years before we have such a service available on a national or international basis, but I have no doubt that this kind of service is the future for document delivery. We shall have to solve the problem of copyright for use of information in electronic format, and we shall have to solve the problem of conservation of electronic data, but given time and the political will to solve these problems they will be solved. In the meanwhile I am exploring the possibility of a local document delivery system using facsimile transmission between the libraries of the University of London, and I know that several groups of US libraries have similar arrangements. It is possible that we will be able to operate such a service at slightly lower cost than BLDSC and slightly faster than BLDSC using our Libertas automated interlibrary loan system, but the advantage of our own local document delivery system over Boston Spa is unlikely to move the balance of advantage significantly away from continuing subscriptions to journals and towards document delivery. Again, to return to the title of this paper, I regard our local scheme using facsimile transmission as being an essay or an attempt to improve the service to our users, but because of the labor intensive nature of facsimile transmission it cannot provide the large scale document delivery system I envisaged in my dream. The RLG Ariel workstation promises to be a great help in cutting the cost of document transmission, and such developments can buy us time to bring about more fundamental changes in document delivery. The key to those changes

must be the availability of the full text of journal articles in electronic format, which will make possible the downloading of journal articles direct to the user without any expensive and slow human intervention.

At present such a mass document delivery service must be a dream, but the technical and structural changes to make it a reality are coming into place. The cost of computer storage is falling as the cost of storing paper journals is rising. Terminals and networks are becoming more efficient means of communication as the pressure upon academic time makes it less efficient for the user to travel from library to library. New electronic journals are springing up as conventional journals become more and more expensive. The tide is flowing strongly in the direction of electronic publication and electronic document delivery. I believe that as librarians we should swim with that tide rather than against it, encourage these developments rather than obstruct them. I believe we should adopt that attitude because electronic publication and electronic document delivery will lead to a much better service for our users. One day my dream may come true. One day my dream will come true.