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Document delivery: future outlooks in the electronic library

The planners of this meeting wisely combined the topic of document delivery with that of electronic journals. The lines between "document delivery" and the electronic journal will become increasingly blurred. Traditionally, document delivery has been equated with "interlibrary loan" and the "on demand" scanning of printed materials and their distribution via mail, fax, or most recently with technology such as Ariel, a software program which compresses images and transmits them via the Internet protocol.

Although we will always have materials which only exist on paper or film, they will represent a decreasingly utilized portion of the scientific literature. Much of the printed journals and textbooks occupying the shelves in our libraries will not be digitized and will need to be shared via traditional ILL. However, the bulk of what will be regularly consulted in the future in medicine and science will exist in electronic form. The technologies of mass storage, improved scanning of printed material and local and wide area networks, especially the Web, will assure that most frequently, when needed, literature will be readily available for transmission to the user.

Today I will focus on one technology which suggests what the future may be both in terms of document delivery and electronic journals. This is the joint Institute for Scientific Information/IBM Electronic Library Project. Whether this project represents a true "electronic journal" or is a "document delivery" methodology is made somewhat unclear by the fact that it incorporates images of printed texts which have been scanned and stored rather than providing access to text in ASCII or other electronic format which was the basis on which the publisher created the original document.

I will present the ISI/IBM ELP in terms of:

the technology it employs

the economic model it utilizes

and the questions which arise as a result of this economic model about the future of libraries,

The Technology

In November of 1995 the Scott Memorial Library of Thomas Jefferson University became the first institution to implement the joint ISI/IBM Electronic Library Project, or ELP.

This project provides a link from the Current Contents Life Sciences Database to images of printed articles from approximately 500 journals.

Since implementation at Jefferson, the test has expanded to include:

Purdue University

Glaxo Pharm. in London

Smith Kline Pharm in Philadelphia University of London

ELP involves the following elements:

production scanning technology at a central location a unique interface based on the Lotus Notes software the Current Contents Life Sciences D.B. Pentium based server

Windows/OS2/ Macintosh clients

TI Connectivity to a central storage facility in Cherry Hill

1200 DPI laser printer.

This is a schematic of the system. The user searches the Current Contents database via the Lotus Notes interface. Searching can be by author, title, keyword, or scanning the contents of a particular journal title. Once he has identified a journal article he wishes to display (and if it is one of the 500 to which ISI has permission to scan) there are several options for the user. If the user's library subscribes to the title in electronic form, it is stored on a local server in the library and can be displayed (Individual issues are routinely transmitted to the server as they are scanned and made available by ISI.) If the user's library does not subscribe, the user can request the article on demand from the server in Cherry Hill, N.J. suburb of Philadelphia). It is then transmitted via a dedicated TI connection. At any point, the reader may then request a laser print of the article. Incorporated into the system is a complex tracking and billing mechanism which records the number of journal articles printed and assigns fees for this.

For comparative purposes, this slide exhibits the quality of an image printed via ELP as compared to one from a photocopy and one delivered via the Internet and the Ariel software.

Before moving on to the economic model, I'd like to offer a few comments about the technology utilized by ELP. When ISI began its planning for this project the Web and HTML were not quite the dominant force they are today. ISI needed a technology partner and sought out IBM, which was itself interested in the storage of large image files. IBM had its own interest in Lotus Notes, which does not run over the Web, and which is quite proprietary in nature. The computing world has significantly changed during the last several years. Clearly the Web, HTML and the Internet protocol have far outstripped Lotus Notes for resource sharing between institutions. For this reason ISI is planning to convert its search engine and display technology to one that is more generally utilized worldwide.

The Economic Model

The content element, being under the control of a third party, the publisher, represents a significant challenge to any corporation attempting to provide electronic access since licensing agreements must be negotiated with individual publishers for each of their titles. Rapid changes in technology have left publishers with considerable uncertainty about how they will recover their costs and make a profit in this new world. Although ISI had intended to provide access to over 1,000 journals, the negotiation of scanning/storage rights with publishers has been a slow one, thus there are only 500 currently available. Still, it may represent the largest number of journals available in electronic form via one vendor and interface.

Unlike the traditional model we have all operated under, in which the university purchased knowledge through its library and made it freely available, the ELP economic model involves access fees for most titles. The economic model is a bit complicated. If the library subscribes to a title in its print form, it will receive a discount for the electronic version. If a library does not subscribe to a title, but wishes to display it on demand, then it is available for a fee for both display and printing.

With this model there are a limited number of prints per subscription for most titles. Each time a journal article is printed the user incurs a fee. Either he is consuming the limited number of prints prepaid under the subscription contract, or, if exceeding that number, he is incurring real, immediate charges. Depending upon how the library has configured its billing system with ISI, the costs of that printing will be billed to the library, or can be charged against the user's credit card. For example:

JOURNAL OF NEUROPHYSIOLOGY: Subscription with printing=\$103

First 10 prints: no charge Next 25: \$2/article

After that: \$10/article

AMER. JOURNAL OF PHYSIOLOGY, ENDOCRINOLOGY AND METABOLISM: Subscription with printing=\$43

First ten prints: \$2/article After that: \$10/article

If one considers the ELP as a document delivery system, then it's worthwhile to compare it with other forms of document delivery, at least in terms of cost. The comparison of various document delivery systems is worthy of a lengthy panel discussion in and of itself. So, again, my focus here is only on the economics. It should be noted that the delivery time for each of these services would be different. For example, ELP would deliver the article over the Internet within a minute or so. CARL Express could do it in less than one hour. And, ILL, if it incorporated fax or Ariel, could deliver within several hours to several days, depending upon the lending library.

(Slide comparing costs.)

My intent today is not to advocate or promote the products of ISI. Rather, I'd like to explore some questions which may come to the minds of library directors and university administrators as we consider the implementation of systems for document delivery and electronic journal systems such as ELP. Unfortunately, I have no answers to these questions today.

Will the funding for access to knowledge-based information shift from the library to the user?

Under the traditional model of building a library collection, the library purchased information once, then stored it and made it available at no cost, except a modest charge for photocopy. Under a system such as the ELP the library can display a journal article an infinite number of times (if it has paid for an electronic subscription), but has a finite number of prints available to it. The costs for these prints are in most cases far above the costs currently incurred by users for photocopying in most of our libraries. Controlling the cost of using information could be very difficult under this economic model, at least from some central point.

In fact, the ELP economic model, and others which may follow it, could shift responsibility for selection of knowledge-based information to the user. If this takes place, how will the university determine how to also shift resources for the purchase of that information? Will universities move funds from the library's budget and provide each user with a limited amount of credit for accessing knowledge?

Or, will universities and other research institutions take an increasingly centralized view of funding access to information and forbid the use of university funds for the purchase of books and journals at the departmental level? As we all know, in the typical university or hospital there are usually multiple subscriptions, sometimes hundreds, to the same journal title. Will the funding for electronic subscriptions and the fees for printing somehow be moved to the library from departments? A study conducted on behalf of the library at Thomas Jefferson University in 1989 indicated that there was approximately \$125,000 per year being spent by departments for subscriptions. Given the difficulties of tracking such expenditures with our current financial software, we believe this may just be the tip of the iceberg. Perhaps twice that amount is being spent each year. Could these funds be distributed to the library in

support of electronic document delivery/electronic journals.

How will libraries recover the lost revenue from sources such as photocopy income if users access their resources remotely?

The goal of most health sciences libraries today is to provide access to information wherever it is needed. The beauty of electronic journals/document delivery is that this can now be accomplished. However, such remote access may also reduce the revenue libraries generate through their photocopy charges. As I mentioned earlier, these charges are usually fairly modest, averaging about \$.08/page according to a recent study. In the aggregate, however, they frequently result in significant amounts, perhaps several hundred thousand dollars per year in support of the library.

If users are accessing electronic journals or requesting documents and printing them remotely, the library will receive no photocopy revenue. What impact will this have on the budgets of libraries? Will libraries themselves assign some small charge to each use of its resources? Will these technologies impose some new economic model on accessing knowledge from the university or hospital library?

Will interlibrary loan die a slow death in the new world of electronic resources?

As our libraries shift their collection dollars from ownership of print to access to electronic resources the game rules for resource sharing will change dramatically. The question of who will have access to electronic information is determined at the time a library subscribes to it. Publishers require that only those individuals named in the contract will be able to access these resources. They cannot be shared with un-named institutions.

Earlier I showed a slide comparing the costs of document delivery, including that involving the Copyright Clearance Center. In fact, however, much of our interlibrary loan activity in the U.S. does not incur charges through CCC because the first five copies each year of borrowing of an individual journal title are covered under an interpretation of the fair use doctrine of the U.S. copyright law. And, there may be no charge from one library to another library for the delivery of a document because many libraries have developed reciprocal agreements. Interlibrary loan is still a very economical method of sharing resources between libraries. Technologies such as Ariel have made it not only economical, but very rapid.

Electronic document delivery from commercial sources and electronic journals will seriously challenge the operations of our libraries. We will not be allowed to share such resources unless there is some further revision of copyright law that protects such use for scholarly purposes. This seems most unlikely to me.

Perhaps the legal restrictions we will face with these products and the related questions of intellectual property rights to scientific literature will finally awaken in university administrations an acknowledgement that our faculties are the source of content of journals sold commercially and that universities should stop giving this content away to publishers who sell it back to libraries. Perhaps it will contribute to a resurgence of university presses and academic publishing consortia that will make knowledge available without a high profit motive.

Will the medical library itself decrease in importance as users have direct access to journals and the delivery of documents from publishers or other providers via the web?

In the United States tremendous changes are taking place in terms of the health care systems. Many universities are divesting themselves of their hospitals, and hospitals are merging to form large conglomerates. Costs cutting, cost containment, restructuring, re engineering are very dominant in our institutions. Especially popular is the idea of "outsourcing", that is, the purchase of services which traditionally were provided internally as part of the institutional infrastructure, but may now be purchased from a source outside the institution.

Medical libraries will need to compete against commercial services that may approach our institutions for outsourcing. And these services have many advantages. They may freely give away some resources, such as MEDLINE access because they may be receiving advertising revenue from pharmaceutical firms and other manufacturers interested in reaching physicians, nurses and other health professionals.

Commercial document delivery providers such as ISI and CARL can do the same thing, reducing the cost of delivering documents by incorporating product information with each journal article they deliver. How will medical libraries based in hospitals and universities compete against such systems? Should they?

Conclusion

Along with the great potential of rapid, remote access that newer document delivery systems bring to us, are a host of serious questions for the consideration of our university and hospital administrations. The economic models of some electronic journal systems, such as Ovid's, are simpler than ISI's. Under the Ovid agreement, the library purchases an electronic journal, and has permission to print any number of times without incurring additional charges. However, Ovid currently offers only about fifty titles, compared with ISI's 500. My suspicion is that Ovid has had a very difficult time negotiating the rights to most journals precisely because of its more liberal economic model. Which model, ISI's, Ovid's or some other ultimately dominates will be determined in the next few years, certainly.

The technology for rapid delivery of knowledge, whether you call it an electronic journal or document delivery is now with us. Libraries need to carefully consider what they may be giving up and gaining with it. And, they need to bring these issues to the highest level within their own institutions so that serious attention is given to the matters of institutional economics, fiscal planning, easy access to information for research and scholarship, and control of intellectual property. And the community of scholars needs to keep watch on these developments remembering always that they are the source of knowledge on which these systems are built. We should not passively accept these systems, we should plan and be partners in determining how they are constituted.