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The Changing Economics of Research Libraries

ABSTRACT

This paper discusses, from the viewpoint of a library administrator, the economic and funding problems raised by the involvement of academic libraries in networks. With increased access to electronic information provided by networks, librarians must be involved with planning what will be available on the network. In addition, a structure is needed to facilitate collaboration among various members of the university community to manage the system. Given the development of electronic information technology and libraries' limited financial resources, librarians must budget for expenditures related to providing electronic information as well as expenditures related to providing access to traditional materials. Librarians will have to determine priorities, scrutinize budgets, and consider alternatives for reallocating money.

INTRODUCTION

The title of this paper was suggested by the title of Martin Cummings's (1986) book, *The Economics of Research Libraries*. This book was the result of a two-year effort that was organized by the Council on Library Resources and involved a number of people and some commissioned studies. Cummings asserted that "we know little about the economics of research libraries or the relationship of library budget decisions to the felt needs of users" (p. 12). Our knowledge of the economics of research libraries has not improved much since this book was published, and, in fact, the picture has become more complex.

A few years ago, the provost of the University of Chicago (UC) began a budget address to the faculty with the statement, "To budget is to choose." Though this is an exciting time for librarians, we are faced with very difficult budget choices. The choices center mainly on trying to maintain the traditional library while incorporating new information technology.

It is difficult to judge whether or not today's economic constraints are that much different from those of difficult periods in the past, but we are all familiar with what has been happening recently to the price of publications that are of interest to research libraries.

Figure 1 is taken from *ARL Statistics, 1989-90* (Stubbs, 1991, p. 6). The graph shows that median serials expenditures of ARL libraries rose 52 percent from 1986 to 1990. In the same four years, the median price per subscription rose 51 percent, while the median number of subscriptions decreased by only 1 percent.

For monographs, the numbers are even more troubling. In spite of a 19 percent increase in expenditures for monographs during this period, the number of monographs purchased dropped 16 percent. Serials were protected to a great extent at the expense of monographs, and libraries have been acquiring an increasingly smaller portion of what is being published. At the same time, patrons' expectations regarding access to traditional information sources have been rising, and the volume of interlibrary lending has increased dramatically.

INFORMATION TECHNOLOGY: PROMISES AND PROBLEMS

There are some truly exciting advances in information technology and the promise of networking—end-user access from offices and homes to a vast array of bibliographic, textual, numeric, and graphic information, as well as new forms of information structured in multidimensional ways previously not possible and approaching the metaphysical. One of the new developments is something called "virtual reality."

UC has not gone nearly as far as some other universities in providing access to electronic information through networking, but it is fairly typical. We have a high-speed campus network that is being extended to most campus buildings. It connects with external networks and is heavily used by some faculty and students. Although the library's online catalog is available on this network, except for law databases and what is freely available on the Internet, we do not provide end-user access to other databases on the campus network. Most faculty and students do not use the campus network because they are not familiar with its capabilities, and, besides, it is not very user-friendly.

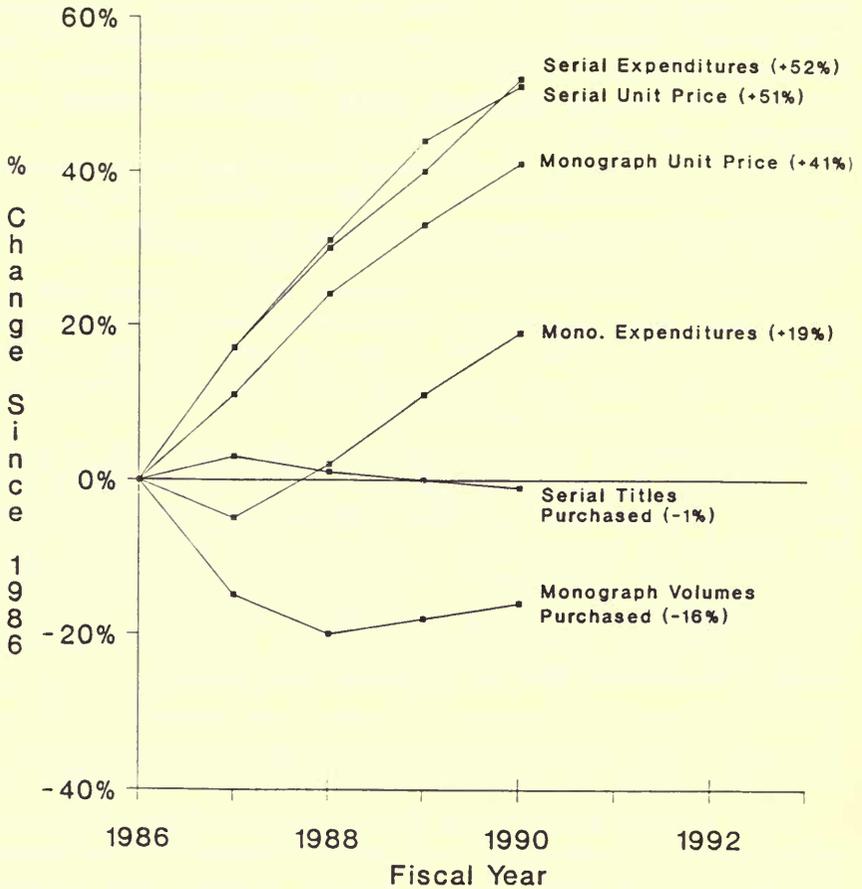


Figure 1. Monograph and serial costs in ARL libraries, 1985-86—1989-90

For the time being, most of the faculty and students do not know what they are missing. But that will soon change. As word spreads and as faculty and graduate students come to our university from other institutions that are ahead of us, the pressure will mount for us to do more, and we will be obliged to do more to remain competitive, as well as merely to do our jobs.

It is troubling to observe that an increasing number of students, and even faculty, at UC—and one must assume at other universities—are inclined not to use the card catalog. Their research is being shaped and limited by what they find in the online catalog. Even the most conscientious of scholars can drift onto the path of least resistance, and in order not to allow the past to be overlooked, research libraries

must place a high priority on converting card catalogs to machine-readable form.

A similar phenomenon relates to electronic indexing and abstracting services when these databases contain entries only for recent years. As more textual and other information becomes available in electronic form, the trend toward regarding only relatively current information will become even more pronounced.

Though electronic information technology has moved at an amazing pace, publications distributed in traditional formats will be with us for a while, and university libraries will continue to manage these formats for the foreseeable future. As one grows older, it becomes easier and easier to predict with great assurance that certain things will not occur in one's lifetime. When the author visits his library's binding and labeling department and sees just one day's worth of the printed volumes that are acquired from all over the world, he knows that most of them will not be superseded by electronic formats in his lifetime. We are obligated to preserve these collections, build on them, and facilitate their use. Unfortunately, it will become increasingly difficult to do so as we divert more resources to new information technology.

WHO PAYS?

How have we been paying for the new technology up to now? Access to electronic information using video display screens was introduced in academic libraries in the mid-1970s and became common by 1980. Since the mid-1970s, academic library budgets have increased steadily. There have been studies that attempt to determine the effect of the increases in terms of actual purchasing power, but the conclusions are not definitive. Regardless of the actual value of the increases, they have been, on average, substantial both in percentages and in absolute dollars. Many academic institutions have stretched themselves to support their libraries.

The breakdown of expenditures of ARL libraries suggests some interesting trends in the past fifteen years. Even allowing for some inconsistencies in what has been included by libraries in the various categories, some trends are evident.

At the author's request, Kendon Stubbs updated a graph that originally appeared in the *1983/84 ARL Statistics* (Daval & Lichtenstein, 1985, p. 4). The updated graph shows the percentage of change in selected categories of ARL statistics for the fifteen years from 1976 through 1990. These data are for the ninety libraries that reported data in all fifteen years. Using 1976 as a base, the figures show the following changes:

Serials expenditures	325 percent
Other operating and binding expenditures	322 percent
Salaries and wages	169 percent
Nonserial acquisitions expenditures	156 percent
Volumes held	48 percent
Current serials received	16 percent
Total professional and nonprofessional staff	11 percent
Gross volumes added per year	-6 percent

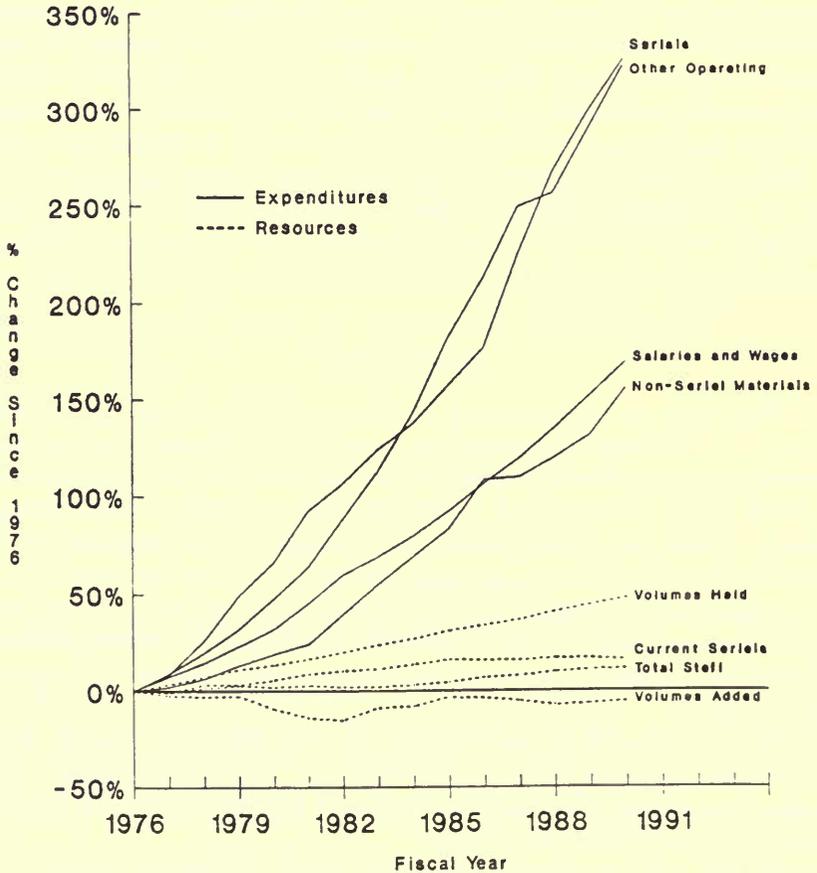


Figure 2. Aggregated expenditures and resources of 90 ARL university libraries, 1975-76—1989-90

The “other operating and binding expenditures” have increased at a much faster rate than total acquisitions or staff expenditures. As

other people have suggested, it seems likely that the disproportionate growth of these other expenditures represents increases related to automation and access to electronic information—expenses such as equipment, licensing and user fees of various sorts, and telecommunications costs. If some libraries are paying some of such expenses from acquisitions budgets, the differences in the growth of the various categories are even greater than the graph shows.

Other added expenditures associated with providing electronic information are staff costs. These are for systems staff who are dedicated to providing the technology, as contrasted to staff who use the technology such as reference librarians and catalogers. These new staff undoubtedly account for some of the increase in staff size.

It is likely that some of the increase in library budgets in the past fifteen years has been earmarked for information technology by the parent institutions and would not otherwise have been allocated to libraries. It is also likely, however, that some money that would have gone to acquisitions budgets for traditional formats has gone to information technology instead. In other words, acquisitions budgets for traditional formats have been squeezed.

Not all expenditures for information technology are revealed in individual library budgets. State systems of higher education have funded systemwide capabilities. And in many institutions, the costs of library processing systems and of providing access to electronic databases have been at least partially supported through the budgets of university computing organizations or academic departments.

But what of the future? As we are faced with system replacement costs and as expectations, technical possibilities, and costs continue to rise, how are we going to pay for it all? Obviously, we cannot afford to pay for it all, and we will have to make choices.

THE "IDEAL" LIBRARY

Libraries are often described as bottomless pits. There seems no limit to the amount of money that could be spent on them, and this is because of the traditional ideal of an academic library—an ideal that never could be fully realized but that everyone wishes for, nevertheless. The following list suggests a few of the characteristics of the ideal library of twenty years ago—an ideal that for the most part is still held today.

- The time between publication of an item and its bibliographical and physical availability in the library should be as short as humanly possible.
- Catalog records should be thorough and accurate and have many access points.

- There should be several comprehensive catalogs, as well as smaller catalogs that are subject-specific.
- The catalogs should contain article-specific entries for journals.
- The library should be open 24 hours a day.
- There should be subject specialist librarians in all disciplines and languages to select materials for the collections and to help people find what they need.
- Reference desks and circulation counters should be open all the hours the library is open and should be sufficiently staffed so that people do not have to wait for service.
- When books are returned from circulation, they should be reshelved within minutes.
- Stacks should be kept in good order and shelf-read frequently.
- Lost, misplaced, or damaged materials should be replaced promptly.
- On those few occasions when something needed is not in the local collections, it should be retrievable from another library in a timely way, preferably within hours.
- All materials in the collections should be physically arranged by subject classification numbers. There should be multiple copies with different numbers when various class numbers apply to the item.
- The library should acquire all of the publications that might be needed for the university's programs of education and research, with at least two copies of each title so that one can be noncirculating and always available on the shelves. Additional copies should be made available when demand is expected to be heavy. For some disciplines, departmental libraries should contain a duplicate subset of what is in main libraries.
- There should be no microfilm. Everything should be in hard copy.

The point of this potentially infinite list is that there has always been a set of impossible standards that people have consciously or unconsciously used in judging a library. Libraries are always less than people wish them to be. The job of the librarian has been to negotiate compromises and to convince people that the compromises are reasonable, that financial resources are being spent wisely, and that the various constituencies are being fairly served. This job is becoming increasingly difficult.

Today's online library catalogs are coming closer to, and even surpassing, the ideal configuration of card catalogs that was fantasized twenty years ago. Electronic information and networking capabilities open up the possibility of someday achieving and even surpassing the other ideals in the list. The technology seems to be within reach, and we are all eager to make this possibility a reality. Our expectations are higher, and the gap between expectations and reality is even greater.

In making budget decisions, librarians have always had to consult widely and negotiate among competing, sometimes conflicting, demands. But the emergence of electronic information in a network environment has made it far more difficult to manage the decision-making process. Many of the historical precedents do not apply to our new environment, and, more than ever before, the decisions require broadly based deliberation and consultation within the institution, and the decisions also require accountability regarding the choices that are made. In many institutions, the political and economic path to changing over to an online catalog was a rocky and precarious one. The road to the electronic library will be even more treacherous.

PLANNING FOR THE NEW INFORMATION TECHNOLOGY

The terms *information technology* and *networks* have been used here rather loosely. Libraries began developing in-house automated circulation and processing systems in the late 1960s and gradually moved toward online catalogs for patron access. These systems are focused on managing the local collections and supporting the operations of the library. Planning the systems, securing the funding for them, and insuring that they are put in place and maintained are clearly the responsibility of the library.

The most appropriate assignment of responsibility for the various aspects of the campus network is less clear. One aspect of campus networks is the development and maintenance of the physical medium of communication and of the software that provides for the transmission of data and for connectivity, within the institution as well as to external networks. This aspect has been compared to building and maintaining a highway. Another aspect is the design and implementation of user-friendly interfaces and directories of capabilities and databases. A third aspect is the selection of electronic capabilities and databases that will be made available and the terms under which they will be made available to local constituents and to people not directly affiliated with the local institution.

Libraries have already assumed a leadership role and in some cases assumed financial responsibility for providing access to databases whose contents resemble traditional library information sources. The present CD-ROM versions of what were previously printed sources seem obviously the province of the library. Networked databases, however, whether mounted locally or available from remote locations, raise more complex issues and expenses.

As networks continue to be developed and the number of machine-readable databases grows, colleges and universities need structures for

identifying options, determining priorities, and choosing among options for the allocation of resources, including making judgments about value and cost. The trade-offs required are too difficult and too politically sensitive to be managed in traditional ways. A structure is needed that provides collaboration among (a) faculty representatives of academic disciplines, (b) staff with expert knowledge of computer and communications capabilities and costs, and (c) librarians who understand the vast array of information that can be made available and the ways it might be used.

It is becoming increasingly important for librarians to be facilitators of decision making, as well as decision makers. They have a major role in identifying issues that must be addressed and in gathering and organizing the information needed to make decisions. Among the information that must be brought to bear on the decisions is the cost of providing information in both traditional and electronic formats. Most libraries do not invest enough money in collecting and analyzing management information. Because librarians are always so far from providing the ideal library, they are reluctant to divert money from activities that will directly and immediately improve services to users. One application of information technology that we should somehow fit into our budgets is the capacity for better cost accounting and the provision of other management information about our operations.

We must assume that income to colleges and universities cannot be expanded sufficiently to pay for everything we would like to do or feel obligated to do. Certainly, we need to continue to make the case and argue for funds. Certainly, institutions that are part of state systems should argue for funding for systemwide capabilities. And certainly, within institutions, librarians should try for cost sharing with other academic departments. But whatever the success of the efforts for funding, economies and trade-offs will have to be made.

Regardless of who controls the decisions and the budgets for networking and access to electronic information, these new capabilities will continue to compete with traditional library collections and services. We must continue to sharpen our priorities, scrutinize our budgets, and consider possibilities for reallocating money. Following are some possibilities for economies in the categories of (a) charging for services, (b) performing traditional services more efficiently, (c) reducing or eliminating traditional services, (d) reducing collecting in traditional formats, and (e) cooperation and resource sharing.

Charging for Services

As access to certain kinds of electronic information and networking capabilities becomes more the accepted norm and is considered a

requirement, not a mere convenience or special service, we will be unable to establish a pricing structure and impose cost-recovery fees to support base-level services. Some faculty and students are willing and able to pay for convenience or for highly individualized service from their own pockets or from grant funds. However, it is firmly embedded in academic culture that the institution will provide access on a more or less equal basis to the basic information people need to pursue their research and education. Charging for access to information would be like asking individual faculty members to rent the classrooms they teach in. This is capitalism run amok. Again, not in our lifetimes are we likely to risk discouraging students from doing research by making them pay as they go for access to the information they need.

Performing Traditional Services More Efficiently

Librarians have always strived to perform services more efficiently. There probably are not substantial additional savings to be realized, but without continual questioning of why we perform certain processes and paying attention to how we do them, efficiency will inevitably decline. Automation was first introduced as a way of performing library processing more efficiently. It did allow libraries to do things better but not necessarily at less cost. In fact, automation has raised expectations and opened new possibilities, so that as the cost of computing and storage capacity has decreased, applications have expanded to more than offset potential savings. As the online catalog gets increasingly bigger and more inclusive, and searching and other interactive capabilities get more and more sophisticated, increasing amounts of storage and computing capacity are used up, necessitating ever more complex software applications and staff resources to maintain them.

Reducing or Eliminating Traditional Services

In addition to trying to be efficient, libraries constantly explore possibilities for reducing or eliminating traditional services. Martin Cummings (1986) bemoans repeatedly the lack of cost analysis of library operations and services. Such analysis is difficult for much of what libraries do, but we need better information about costs to help us make choices, including choices regarding new information technology. As technology advances, we need to reexamine some of the old targets for budget cutting and see them in a new context. Perhaps the convenience lost by closing a departmental library could be more than offset by a new kind of convenience.

There are limits, however, to how far we can go in measuring and quantifying the benefits of libraries in general and the particular services

they provide or the values that they represent. Academic libraries exist to support the goals and missions of their institutions. How can one establish a dollar value or do a cost-benefit analysis of much of the research and education that takes place in academic institutions?

Reducing the Level of Collecting in Traditional Formats

Can we consider offsetting the cost of electronic information by cutting back on acquisitions in traditional formats? In a sense, academic libraries have already reduced their level of collecting in traditional formats in that they are collecting an ever smaller portion of what is available to collect. Is there a realistic possibility of choosing to reduce the present level of acquisitions budgets by 25 percent or some other substantial amount? A reduction in acquisitions would also result in a reduction in the costs of processing and of space, though costs of providing access to other collections might increase.

Libraries have been reluctant to give up the printed versions even of sources that they are acquiring in electronic form, such as bibliographies and indexes on CD-ROM. Giving up the printed versions, although not encouraged by present pricing structures, would produce savings, but libraries have been concerned about losing ownership and being at the mercy of producers.

A particularly interesting example of the ownership issue is the extensive full-text literature in the field of law and on a broad range of other subjects that is available through LEXIS, NEXIS, and WESTLAW. The UC law librarian estimates that these databases contain the texts of over 97,000 of the volumes in the Law Library, which is 18 percent of its entire collection. Of the 12,500 volumes added to the Law Library last year, approximately 30 percent, or 4,000 volumes, are in these databases. All UC Law School faculty and students now have access to these databases from homes and offices, as well as from terminals in the Law Library, with no contractual limit on the amount of text they can print. All of this access is made available at unrealistically low rates because the vendors want law students to become dependent on these resources so that, when they go into practice, they will continue to use them but pay full freight. It will be interesting to see if use of the print collections in the UC Law Library declines sharply in the next year or two; it probably will.

We have not yet been able to bring ourselves to eliminate the printed versions of what is covered in these databases; we are concerned about becoming dependent on the electronic versions and vulnerable to greatly increased costs in the future. What happens if the vendors decide that these databases have become so firmly established and indispensable that they no longer need to offer such attractive rates to libraries, and

we are suddenly faced with paying hundreds of thousands of dollars to continue the access we have had? Theoretically, we could revert to using only the printed forms of the publications, but realistically, can we? Once accustomed to the convenience and superior access of the electronic format, will faculty and students tolerate a return to access only to the printed form? Probably not—particularly not lawyers!

There is a clear danger that, if for-profit producers of electronic information acquire a monopoly or near monopoly on information in electronic form, we could face even worse profiteering than we now face with a few publishers of science journals. Although some people have predicted that further development and expansion of the publication of electronic journals will help us to address the high cost of journals, the economics are not so clear. Perhaps the effect of electronic journals will be like that of library automation: Enhance access immeasurably but not save money.

Resource Sharing

Libraries have for many centuries looked to cooperation and resource sharing as a way of fulfilling their missions. There were union catalogs of manuscripts long before the invention of printing (Richardson, 1936, p. v), and it is likely that groups of monasteries coordinated their copying of manuscripts.

Academic administrators see cooperation and resource sharing as a way of saving money. Librarians, on the other hand, see it as a way of expanding the information sources that can be made available to their constituencies, but not necessarily as a way of saving money. By cooperating, librarians can provide information and services that they could not otherwise provide.

The primary manifestation of resource sharing is the sharing of access to collections—on-site or by way of interlibrary lending. Access to collections held elsewhere is becoming increasingly important. Sharing of collections does not necessarily involve coordination of acquisitions among libraries. It can be merely the sharing of whatever materials libraries happen to have collected in trying to satisfy local needs. Although there has been a fair amount of informal coordination of acquisitions among libraries, we have been less successful with larger, more structured, and more formal programs. (An important exception is the Center for Research Libraries.)

We should try to do a better job of coordinating acquisitions among groups of libraries to insure that, collectively, we provide the broadest possible range of collection resources. Networking and information technology are providing mechanisms for improved coordination, and access through networks to the order files of other libraries is already

affecting acquisitions decisions. Implementation of serials control systems in more libraries will provide the kind of specific and current information that is needed for better coordination of serials acquisitions. We should continue to reexamine the possibilities for coordination as networking and information technology improve.

At the same time, we should continue to improve even more the timeliness and reliability of interlibrary lending. To improve it to the level it should be, we must begin to think of it more as a business proposition and not as a moral issue or a test of altruism. The costs of borrowing or lending an item or providing photocopies through interlibrary loan are not trivial. Aside from fees that lending libraries might charge, the average cost of an interlibrary loan transaction is at least \$8 on each end of the transaction, and some cost studies indicate it is \$15 or \$20. At \$8, which is probably low, the cost of 10,000 interlibrary loan transactions is \$160,000. It is puzzling that most libraries bury these costs in various parts of their budgets.

First, libraries should understand the costs of borrowing for their patrons and budget for it as a service. Second, lenders should be compensated for their costs. Most libraries will expedite lending transactions only if they are not losing money for their efforts and detracting from their local priorities. These points bear emphasizing because it is only by being more businesslike about interlibrary lending that we can maintain and improve the sharing of collections and provide the basis for more refined coordination of collection development. Access in place of ownership does not mean access without cost. It is possible that all the money now spent on interlibrary lending and borrowing could pay for a superior document delivery service on a very different model. We will not know this until we face up to the true costs of the present system.

There is also room for cooperation and sharing in the provision of electronic information, but, as with print collections, we must not assume, and base our planning on the assumption, that we can share freely without regard to cost. Producers of electronic information have a legitimate concern about recovering the costs of producing it, whether they are in the for-profit or not-for-profit sector. As with interlibrary lending, if external use of locally supported databases and other electronic information capabilities interferes with local use, owners of the resources will not be forthcoming in allowing access unless they are compensated.

CONCLUSION

This paper has not been able to address the economics of providing access to networking capabilities and electronic information as fully and

specifically as the author would have liked. It has merely alluded to what everyone knows: it will cost more money than we can see our way clear to provide. The day when a scholar can sit at a workstation and have the entire world of information, or even a substantial portion of it, available at the click of a mouse or a voice command is a long way off. On our way to this day, we have some interesting cultural, technical, and economic issues to wrestle with. We will be required, as J. Warren Haas put it, "to make fundamental changes in the very definition of what a library is and to recast operations and services in a dramatically different mold" (Cummings, 1986, p. 7). Those of us in the business of recasting that mold are privileged to have such challenging and interesting jobs, but we have difficult choices ahead of us.

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