



The Future: Libraries, Librarians and Users

HAROLD M. SCHOOLMAN

THE ROLE OF soothsayer is an appealing one, for no one is really expected to see into the future. Thus, if one fails to guess correctly, his erroneous predictions are soon forgotten. But if by chance one should guess correctly, he can always remind the world that he had done so. My experience is limited to information processing in health science, and my predictions are within this context; its generalization will have to be assessed by the reader. My prediction is simple: the next ten years will see an increasing demand for a marriage of information handling, communications technology, learning theory, educational design and educational technology in order to help the health science community respond to the demand for health services. Libraries will have to handle technically more information packaged in an increasing number of formats. To this indispensable function will be added increasing demands in support of educational objectives.

The education and experience of the librarian must be expanded to meet this new role. He must become a professional member of the planning and implementation team or someone else will, and then the librarian will only be an information handling technician. The academic institution must accept the fundamental role of information services in its programs and give academic recognition to the professional librarian. The medical library must become an integrated part of the educational resources of the institution. The medical librarian must become an integral part of the planning and decision-making process in pursuit of the educational objectives of the institution.

These objectives are slow in developing but not because of objections by medical librarians. Although their traditional reticence and limited appropriate training and experience may contribute to the inertia, it is the power structure of the institutions which have failed to recognize and implement this realignment.

Harold M. Schoolman is Assistant Deputy Director, National Library of Medicine, Bethesda, Maryland.

The next ten years will be a critical transition period which will determine in large part the fate of libraries and librarians as they are currently known. Nevertheless, the changes that actually occur are much more likely to be attitudinal than operational. There will, of course, be refinements and extensions of existing methods. New and greater appeals will be made to the gods of modern technology to shore up libraries' crumbling walls. Some, perhaps most, will view the changes as a mortal threat to their very existence, others will see them as a long desired opportunity to broaden horizons and firmly establish information resources as the cornerstone of health programs.

Innovative thinking, particularly examination of some basic hypotheses or assumptions, is needed. Undoubtedly many schemes will put forth—some of which will have considerable merit, others not, and some may even be attempted on an experimental basis. But in the cyclical evolution of history it is unlikely that any major operational changes will actually be effected. Nevertheless, the important changes which will occur have already begun, and they deserve attention.

SUPPORT OF EDUCATIONAL OBJECTIVES

Any medical library has a fundamental responsibility to pursue the effective utilization of its resources by health science professionals. Regardless of the kind of user—practitioner, researcher, teacher or student—or his objective, the fundamental purpose of information transfer is education. The effectiveness of the information system must be measured in terms of its success in supporting and achieving educational objectives, not by the number of documents moved. Librarians must orient their concerns to the educational objectives of their institutions rather than to the aggrandizement of their libraries.

Support of educational objectives requires the recognition by the institution that information support is fundamental to all their programs. It must, therefore, be intrinsic to their planning, integrated in operation, and budgeted as a fundamental part of the program requirement. The librarian must abandon the more traditional tendency of the responder to become an active advocate who can successfully compete in a world where needs always exceed resources. When the budget crunch comes, money for support of information needs must not automatically be the first to go.

To perform this important function, librarians must accept an additional and burdensome responsibility—accountability. Accountability implies effective utilization of resources. In today's

The Future

world efficiency is a prerequisite to effectiveness. Accountability also demands critical examination. Examination of the products is undertaken as a measure of effectiveness in achieving the educational goal. Examination of the process is undertaken to determine the efficiency with which the products are produced.

Clearly, even superficial examination of the process demonstrates that efficient utilization of resources requires a marked expansion, on a national scale, of coordinated planning and sharing. The Regional Medical Library Program provides a basis for the pursuit of this objective. Considerable progress has already been made in developing a national system of interlibrary loan; however, much yet remains to be done. Coordinated acquisition, consortia development, and maximal exploitation of the network's potential should be pursued in all aspects of the process.

To date little attention has been paid to similar rationalization, on a national scale, of the important archival responsibility. Although it is probably true that a large percentage of the volumes held in an archive are of no use, there is no way of identifying which volumes they are. Intrinsicly, therefore, an archive is a very inefficient and thus very expensive operation. It is, however, indispensable and must be supported; hence, it is critical that an assiduous pursuit of the development of a national archival plan be undertaken.

Modern communications technology can be a valuable ally. It should permit a marked broadening of horizons in pursuing solutions. Planning can be freed of limitations of time and space, for if librarians can define something modern technology can build it, and if it is truly useful the market will pay for it.

Potentially, communications technology can also be an enemy. Its availability can seduce libraries into doing things because they can be done, rather than because they should be done. It can also help perpetuate the status quo by doing things better rather than doing better things. The rapid advances in technology can provide such a fascinating array of solutions that the problem may well be forgotten. An appreciation of technology's potential in the service of information needs adds an additional dimension to the librarian's responsibilities.

EXPANSION OF THE HEALTH CARE INDUSTRY

If this picture is one of increasing demands it is also one of increasing opportunities. One of the most important reasons for the increased opportunities is the changing milieu of the health science community.

The health services industry has grown into the third largest industry in our country. This growth has been accompanied by an ever-increasing demand that quality health care is a right—not a privilege—of every American. This concept is reinforced by increasing coverage of costs through third party insurers as well as the growing pressure for national health insurance. With this growth has come increasing accountability—not only for cost, but also for the quality of service.

Academic health centers are increasingly engaging in programs extending beyond their traditional constituents. Each such program (area health education centers, decentralization of medical education, cancer control, continuing education, etc.) requires an information base for its success. Program directors must come to understand their dependence on this information base. They must plan and budget for it from the beginning. They must learn to use the well-developed systems properly and neither reinvent the information services wheel nor turn to the existing system after the fact with unbudgeted, unreasonable demands.

As desirable as this may be, it would be naive to believe it will evolve rapidly as a result of irrefutable logic. It is the demands of user needs generated by the changing social milieu which have created professional standards review organizations; recertification, relicensure, automated confidential self-assessment, medical audits and rising peer pressure will force these necessary changes and overcome the basic inertia of the system.

But it is also the time for positive action on the part of the library component if its expertise is to be brought to bear on evolving relationships. What is required is that librarians create and take advantage of forums to discuss these problems with responsible program and administrative officials of educational institutions. Innovative concepts for the development and support of information services and the problems of existing ones should be discussed with deans, department chairmen, hospital directors of medical education, administrators and students—not just with other librarians.

The Council of Deans of the Association of American Medical Colleges, the vice presidents of Academic Health Centers, and the Association of Hospital Medical Education, have all agreed to the importance of this interchange. The Regional Medical Library outreach program for community hospitals should not limit itself to continuing education of hospital librarians, but extend its efforts to hospital administrators and staff, even to hospitals with no libraries.

The Future

Some of the subjects that require early consideration in this dialog are: the place of the library in the organization of the institution; the impact and potential of networking; means of effectively reaching the health science professional community; the funding of information services; and effective liaison with other organizational elements (e.g., department of continuing education, department of biomedical communications, department of research in medical education).

CHANGES IN HEALTH SCIENCES EDUCATION

The changing milieu is reflected in health science education. The organization of health science education is moving more and more toward decentralization. This makes it necessary to bring faculty expertise to the student wherever he is and requires use of sophisticated communications systems including satellites. Additional demands are created by the restructuring of health science education which requires autotutorial educational materials. The student proceeding at his own pace requires a new set of learning tools.

There is also a changing philosophy of health science education. The former concern with the acquisition of facts is being replaced with a growing concern for the ability to synthesize information and use it for problem-solving. Indeed, this concern is reaching the point where the teaching of problem-solving has in some instances become the primary educational objective.

The pursuit of this objective requires the development of a new literature, and it requires a new dimension to bibliographic control. Some experiments have already been undertaken to explore the power of existing systems to adequately retrieve on the basis of educational objective and student level. Such work will undoubtedly be accelerated in the next decade. Thus, the professional librarian must now acquire an appreciation of learning theory and an understanding of what health science educators are trying to accomplish.

The truly important consequence of this philosophic change in educational objective is the increasing recognition given to faculty members for the design, creation and testing of this new literature. This subtle but pervading change in our reward system is promoting a mobilization of talent experimenting in all media—written, audiovisual, computer-aided instruction, etc.

In the field of continuing health science education, accountability for quality of service has led to a mounting demand for quality assurance. This demand has taken many forms: relicensure,

reaccreditation, self-assessment testing, and medical audits via professional standards review, as well as other programs. The philosophic concept of a lifelong interactive evaluation system for health professionals reaches its greatest development in the recently published report of the Committee on Goals and Priorities of the National Board of Medical Examiners entitled *Evaluation in the Continuum of Medical Education*.

It has long been known that from the point of view of the health practitioner the most attractive information system is one which provides an immediate answer to his specific question. Witness the popularity of the Medical Information Service Via Telephone (MIST) in Alabama. It has been equally clear that this type of system, responsive to the self-identified information need of the practitioner, is insufficient to assure improved quality of service. But the current pressures, in one way or another, demand a medical audit and an information system which is interactive with that audit.

In various areas of health science education sufficient pressure is developing to demand support and recognition for reorganization and synthesis of biomedical information. This new literature must be effectively accommodated. To do this requires the contributions of many elements of the health science community. That these will respond is illustrated by the developing coordinated program on multimedia education resources.

At the moment, this arena can be succinctly described as chaos. No real discipline exists in production, editorial review, indexing, cataloging, storage, retrieval or distribution. The chaos of the software aspect is matched in hardware where a rapidly changing, highly competitive technology has led to an almost total lack of standardization and convertibility.

The NLM, in collaboration with the Association of American Medical Colleges and the American Association of Dental Schools, has begun a comprehensive program to attempt to bring order out of at least a small segment of this chaos. This program represents a collaboration between federal agencies (NLM, Bureau of Health Resources Development, VA and the Armed Forces) medical and dental schools, professional societies, hospital educators and medical librarians. This base will eventually be expanded, but in the beginning it was necessary to limit the program to a size on which the available resources might have a discernible impact. The AAMC and the AADS are acting as a managerial focal point for the academic and professional health science community, while the NLM is serving a similar function for

The Future

federal agencies. This program is pursuing the development of a comprehensive review process for audiovisual materials. In addition, with the help of several hundred potential users and many medical librarians, a computerized, searchable retrieval system is being developed. The review system is already operating, and the bibliographic control system will be operational in 1975. months.

An additional component of this program is the planning, production, and testing of educational materials not already available. The basis of this program is the sharing of resources. The content expertise for critical review, for the identification of basic concepts that need to be developed, for the development of story boards of pilot productions, and for the testing of materials produced is the responsibility of the academic community.

The AAMC and the AADS provide management coordination in all of these areas and continuing consultative support. The National Medical Audiovisual Center provides media and production expertise and, with the help of the Bureau of Health Resources Development, supports the development and testing of new materials as well as the critical review of older ones. The Armed Forces and the VA make available their productions, coordinate their production activities with the program and provide additional testing grounds for materials. A large group of ultimate users and the medical librarians provide important input into the development of search strategies and bibliographic control systems as well as the opportunity to test search systems during development.

The Association of Hospital Medical Education assures the resources for testing at the hospital level. In addition, it contributes to the identification and generation of new material. The NLM is responsible for the clearinghouse function, and the RML network will assist in discharging this responsibility. Plans are already well developed to train at least two "educational resource medical librarians" in each region.

Finally, plans are being studied to develop a comprehensive distribution system which will assure the individual user the greatest possible flexibility in the use of these materials at a nominal cost which essentially recovers only reproduction and distribution costs. Although the program is only a year old, the collaboration already achieved is testimony to the great pressure on all segments of the health community for the efficient utilization of resources through sharing.

PRODUCTION, RECOVERY AND SYNTHESIS OF INFORMATION

Examination of the product is a joint responsibility. The effectiveness of the product must be measured in terms of the educational objective. The educational objective must be defined by the user. Perhaps an examination of retrieval of the serial literature in support of research will be illustrative. As background for an attempt to formulate the educational objective served by our current practices it might be well to examine the reasons this literature is created.

Why do research workers write? While any in-depth discussion of this point is beyond the scope of this paper, at least two reasons can be stated. First, the reporting of results for the benefit of science, and the critical scrutiny of peers is considered by most scientists to be an integral part of the research process. Second, the reward system of our society gives high priority to publications by researchers. Some believe this amounts to an almost exclusive priority, giving rise to the phrase "publish or perish." It is believed by some that "priority recognition" is the fundamental driving force of scientists. Without a reward system that gives ultimate recognition to the first reporter, the *èlan vital* to investigation would be lost and science and society would suffer. It is not the purpose of this paper to discuss the pros and cons of this oversimplified presentation. Whether correct or incorrect, in the past or the present, it is the thesis under which at least most of the world's scientists live and work.

The number of articles written is an important criterion for reward in the research community. This fact also markedly influences the format of reporting and makes the journal article preeminent. The other side of the coin is the overwhelming concern of bibliographic control systems with retrieving all pertinent citations. In an unthinking way we tend to equate this concern for completeness of citations with concern for completeness of information because of its importance to the scientific purpose of the requester.

First, it is clear that 100 percent recovery of pertinent documents in today's system is impossible (NLM indexes only about 12 percent of what it considers to be in scope). Second, it is equally clear that 100 percent recovery of information is also impossible. However, because of the marked redundancy of the medical literature, the rate of information recovery is initially quite rapid even from a random selection of pertinent documents. For example, if one were interested in recovering the information available which gives rise to the presumption of a viral etiology of human leukemia he would have no difficulty recovering several thousand articles, most of which

The Future

admittedly would have to do with the viral etiology of leukemia in animal forms other than human but which obviously are germane to the thesis. From these thousands of documents—even if one chose at random the order in which they were read—one could acquire perhaps 90 percent of the basic information on the subject by reading the first fifty. That is to say, by the time one had read the first fifty articles, regardless of how chosen, the information recovery curve would have reached a nearly flat slope and the amount of additional information added by increasing the number of documents read even fifty-fold would be extremely small. Obviously, under no circumstances would there be a total recovery of all information available; to assure that one would have to recover and read all documents relevant to the matter, and no document recovery system can claim 100 percent recovery even of the pertinent documents within the system, certainly not all of the pertinent documents. Therefore, 100 percent recovery of information available is unobtainable. The issue then is: How much is one willing to pay to gain an additional 1 or 2 percent recovery of information?

In point of fact, the researcher does not rely on the medical literature for providing him with information on the subject of his primary concern at anywhere near those levels. It is much more likely that the medical literature contributes only 40 to 50 percent of the information known to the researcher in the area of his most immediate concern. Therefore, the justification for the completeness-doctrine approach of recovery of documents is even less valid. Nevertheless, it is pursued and has persisted, and so one must ask: Why? If it is not for the scientific purpose, then for what purpose is this completeness sought? To a large extent, it is derived from the reward system of our society and from the priority doctrine.

The priority doctrine is probably far less important in the days of multiple authorship on highly technical issues than it is with regard to some basic philosophic questions such as those propounded by Darwin and Newton. The distinction is not one of time or history, but rather of the nature of the discovery for which priority is being claimed. If the completeness doctrine were avoided, those situations of fundamental discovery today would probably give rise to priority disputes no less and no greater than they have in the past. However, it is possible that modern communications have made the fundamental role of most contributors to any field so well known and well understood that the priority disputes today might be less, at least in the eyes of peers. But it is not because of adjudication of disputes, but rather because citation is a highly prized form of recognition that completeness assumes its real importance.

For the research worker reviewing a peripheral field and seeking a less than exhaustive but reasonable appreciation of a concept, the current retrieval system may deliver an enormous number of citations which will do more to frustrate than satisfy his information needs. Not true—the librarians immediately reply—because those citations will easily identify several recent review articles which, after all, are supposed to answer this need.

The review article is an attempt at data reduction within a format that assures as complete recognition as possible to all contributors. It attempts to survey a subject, pointing out highlights according to the judgment of the reviewer. It serves a dual purpose of hopefully giving an overview of a subject and providing a bibliographic source for more detailed pursuit, but it is not designed to achieve a critical synthesis of available information. It should be designed as a matrix of information about an hypothesis. There might clearly be value when describing an element in this matrix to state that twenty different investigations have corroborated this point in order to document the authority for the statement, but there is no fundamental additional value in either identifying all twenty or describing in detail each of the twenty pieces of work.

The concept of the review article should be the critical evaluation of an hypothesis by organizing and synthesizing a large volume of data in order to reduce it to a small number of critical elements determinative of the hypothesis in question. The purpose of the exercise should be a critical examination of the hypothesis both to determine if it can be sustained, and also to point out the holes in the information base supporting it.

The user does not need better library methods; he needs a more direct route to the information he seeks. This requires revised or additional formats for information. This reformatting of biomedical information is not the responsibility of librarians. If service to the scientific need of the user is the objective, biomedical librarians must learn to store and retrieve synthesized information. Advocacy of this position is not new and the issue has been attacked. There are, of course, many problems, but these are not the main deterrent to progress in this area.

The synthesis of information requires the efforts of our most competent scientists. In the structure of our current scientific reward system there is no incentive for this activity; until this is changed, there is little hope for quality output of this type.

The Future

The next decade holds many challenges and opportunities for the whole health science community. The professional medical librarian of the future should operate as an integral part of the health science education team and, therefore, of the decision-making process. To prepare for this role, careful and extensive reorganization of their training needs to be undertaken. But the technical handling of information cannot be neglected. New relationships and probably new organizations will be developing within and between educational institutions. Society will continue to make more and more demands for more rapid direct access to information. A new literature will continue to expand. It must be effectively accommodated. This is both a great opportunity and a challenge. The future role of medical libraries and librarians may well depend on their response.

This Page Intentionally Left Blank