50th Anniversary Feature—

Management of Information

Miriam A. Drake

Academic libraries face challenge and an uncertain future. If libraries are to maintain their role in learning and research, they need to shift their focus from documents to content and from collection to individuals. This article discusses library concerns in 1939, services made possible by technology, and the necessity to implement information management strategies on our campuses.

Librarianship is one of the world's oldest and most successful professions. It has survived war, plague, famine, economic depression, and varying social values and conditions. The profession has shown an extraordinary ability to adapt to changing social and economic conditions and to adopt changing technologies to serve a variety of people with diverse interests and needs. The future of librarianship depends increasingly on our ability to change and to formulate new visions and goals.

The future will be driven by computers with greater power and ease of use, new information storage devices and access methods, increased competition, and changing consumer demands and capabilities. Faculty and students are no longer content to spend hours at the library looking for documents that may or may not contain needed data or information. They want remote access to content and information tailored to individual need. These changes will place greater challenges on librarians to adopt, adapt, and innovate. Librarians have a unique opportunity to contribute to the instructional, research, and service missions of their institutions through the management of information and teaching their clients and users to manage information.

Librarians have knowledge and skills that few people in academe possess. We have been managing large collections of documents, answering questions, and responding to people's document needs for hundreds of years. Now we must use our knowledge to provide content, decision support, and solutions to problems. We must shift our attention from physical documents to individuals, from document delivery to information management and transfer, and from question answering to problem solving.

This paper will review the past, present, and future of information activities in academic libraries. It will show how librarians can use current and emerging technologies to change the direction of information activities and enhance the productivity and satisfaction of library clients and users. The term *information management* is here used broadly to encompass all forms of information and the management of content, access, and delivery. It also includes information awareness, literacy, and use.

1939–THE END OF AN ERA

The birth of *College & Research Libraries* occurred at an extraordinary time in the history of our nation. We were recovering from the worst economic depression in our history and worrying about our involvement in wars in Europe and Asia. Many events occurred in 1939 that will

Miriam A. Drake is Dean and Director of Libraries at Georgia Institute of Technology, Atlanta, Georgia 30332-0900.

have lasting impact on individuals, institutions, and the world.

In 1939, Robert Sherwood won the Pulitzer Prize for *Abe Lincoln in Illinois*, John Steinbeck published *The Grapes of Wrath*, and the nation saw *Gone With the Wind*, *The Wizard of Oz*, and *Goodbye Mr. Chips*. The New York Yankees won the World Series, USC won the Rose Bowl, and the Boston Bruins won the Stanley Cup. Marian Anderson was barred from performing in Constitution Hall and Eleanor Roosevelt resigned from the DAR. A.T.&T. provided free long-distance calling from the New York World's Fair, at which people viewed regular television broadcasts. For many people the New York World's Fair was their introduction to modern technology. Germany invaded Poland. Japan invaded China. The American Library Association protested the appointment of Archibald MacLeish as Librarian of Congress.

Librarians and educators were concerned about the integration of libraries and programs of instruction. Harvie Branscomb, Director of Libraries at Duke University, was concerned about the lack of library use by undergraduates and the faculty's need for books.[1] A. F. Kuhlman, the first editor of *College & Research Libraries*, described crises in higher education, research, and libraries. He was concerned with issues of professionalism and the lack of involvement by libraries in the life of the university.[2] In *CRL*'s first issue, Harold Leupp stated, "To try to care for the differing and often conflicting need of hordes of undergraduate students on the one hand, and of graduate students, faculty and research men, on the other, in the same building or buildings, with the same collection of books, and very largely with the same staff, is to attempt the impossible."[3]

In 1939, there were 1,708 colleges and universities in the United States with an enrollment of 1,494,203. Today, there are approximately 3,300 colleges and universities with an enrollment in excess of 12 million.[4] Leupp's concern with numbers is trivial by today's standards but can be appreciated for its content. Many articles that appeared in 1939 could have been written today, as they detailed concerns with preservation, bibliographic instruction, circulation statistics, union lists, and cooperative collection development.[5]

Librarians and others forecast the future of libraries in 1939. Frederick Keppel predicted that by 1958 library buildings would be air conditioned and humidity controlled, assistants would not be sorting cards, the form of the record would make no difference, and the selection of nonwritten records would be just as hard a job as the selection of books. He also forecast that we would use business machines to deal with the library catalog and that we would worry about the protection of property rights in information not printed.[6]

Reading the literature of 1939 brings to mind the story of a group of people attending their twenty-fifth college reunion. They visited their economics professor and noticed the final exam on the professor's desk. One member of the group said, "Professor, this is the same test you gave us twenty-five years ago." The professor said, "Yes it is. You see, the questions remain the same but the answers change every year." In librarianship many questions have remained the same for fifty years or more. Many new questions have arisen. Librarians have found answers to some pressing questions while others remain unresolved. Despite Keppel's prediction of air conditioning and humidity controls, many libraries still have rain forest conditions in the summer and desert conditions in the winter.

While Keppel and others could foresee a nonprint world in 1939, they could not predict integrated circuits, computers, high-density magnetic and optical storage devices, optical fiber cable, or the accelerated growth of information. Keppel accurately forecast problems of intellectual property rights. These problems have been exacerbated by the tremendous growth in machine-readable data files and software and the growth and diversity of the publishing industry.

In 1939 academic libraries were concerned with books, and special libraries were concerned with information. Scholarly pursuits involved access to and use of books, documents, and other printed rec-

ords. During World War II greater use was made of microfilm because of the vast number of documents to be stored. World War II also changed the way people handled information. Data originated in many forms. These data had to be gathered, classified, analyzed, synthesized, and transformed into information to be used in decision making by high-level military and civilian personnel.

In 1939 Carl Milam, secretary of the ALA, said, "The modern library is not sure of its fields, functions or specific objectives . . . the library of the future will be a much more useful servant of individuals and of society than any library has yet become."[7] Milam's words could have been written in 1989. He added that the library of the future would continously change and urged librarians to experiment.

ACADEMIC LIBRARIES TODAY

Today's academic library is a high fixed cost operation emphasizing input rather than the value of output. Echelman points out, "The more books, journals, manuscripts, and other materials a library acquires, the more difficult it becomes to organize them coherently for use. But coherent organization is essential if the vast, multiformatted inventory of the modern library (both its owned and its accessed inventory) is to be made available to its clients."[8] Input costs—materials and labor—have escalated in the last five years. Materials costs, driven by inflation and a weak dollar, have placed great pressure on scarce financial resources.

Librarians have been provided long overdue salary increases, which will probably continue to rise as educational requirements increase. At the same time, libraries have had to pay for computers, a variety of external services, and more training for staff.

While costs have risen, increases in user productivity have been small. "While we have become mesmerized with our ability to add and store data elements . . . we have literally ignored the information itself—that is the content, the value, and the use of the vast quantities of data, documents, and literature that are not available in machine-readable form. . . . Too often we do not know what information we have and how it is used: too often we settle for quantity without regard to quality."[9] User productivity and satisfaction result from delivery of appropriate content, not access.

"Librarians continue to be more concerned with delivery of documents and have not focused on delivery of content or the data and information contained in the documents."

While librarians today are experimenting with a variety of technological tools and techniques, many have not moved beyond quantity to quality and value. The emphasis is on materials; access to collections, both resident and nonresident; and access to a variety of indexing and abstracting services. Some libraries offer these services on in-house computers or shared computer systems such as CARL. Carnegie Mellon University and Georgia Tech offer online services to faculty and students in their homes and offices through campus networks. Other libraries are using CD-ROM to provide access to abstracting and indexing services. Librarians continue to be more concerned with delivery of documents and have not focused on delivery of content or the data and information contained in the documents.

Most academic libraries are facility-bound operations. Users physically must go to the library for documents. Few libraries deliver documents. Many libraries insist that borrowers personally sign for loans. Few libraries provide copies of the catalog or other information resources outside the library building.

The literature continues to discuss critical issues of preservation and conservation as well as resource sharing and cooperative collection development. These are not new issues. The new issues relate to the use of technology, relations with computer and media centers, and quality services designed to provide value to individuals.

Academic libraries operate in complex environments. There is a large and growing gap between technological possibilities and our ability to translate possibilities into reality. The gap between client expectations and our ability to deliver also is widening. Students and faculty are familiar with a variety of computer-based services. Individually, they may subscribe to The Source, CompuServe, and other services. They look for information in machine-readable form because they know it is available. They want to download information and manipulate it on their PCs and work stations. Our clients are aware that it is technologically possible for them to access full-text, graphics, and numeric databases as well as bibliographic databases. They are asking more and more why libraries persist in providing information on paper when information is available on computer-based systems.

We have a tendency in libraries to think of information as concrete—a page in a book, a microfiche, or CD-ROM. Information, in reality, is abstract, changing, and dynamic. Information adds value to a variety of processes but its benefits depend on the ability to use it effectively. Information use is an intellectual process. There is an inclination to confuse means and ends in information operations. Books, journals, databases, software, and networks are tools. They are the means by which people answer questions, solve problems, make decisions, learn, and achieve a desired outcome.

The goals of libraries relate to usage of tools rather than achieving desired outcomes. The goals of libraries should be evolving toward reducing user costs and contributing to the success of our clients in achieving their goals.

MANAGEMENT OF INFORMATION

Information management, in contrast to traditional librarianship, emphasizes individual service, content, and the value of output. Brinberg defines information management "as the process of acquiring, organizing and manipulating collections of data elements to meet specific user needs. . . . It is essential, too, to keep in mind it is the content that is being managed and not the machine, the people, or the facility."[10] Marchand and Horton stress the importance of transforming data into information and information into knowledge. They also indicate the need for information management strategies to be linked to the functional strategies of the organization.[11] Poppel and Goldstein discuss information resource management as "the ability to enhance decision making through the retrieval and manipulation of a variety of internal and external information."[12]

Management of information begins with the assumption that each information seeker brings a unique mindset to problem solving. Each person has a unique information system and cognitive style that must interact with library systems designed for general use. Library catalogs, whether in cards or online, are designed for the masses. Sophisticated database management systems can tailor the system for individual users and help them manage their own systems to suit their unique needs.

In an academic institution information management strategies must build on the content of academic courses, the substance of research programs, the components of service activities, and specific data needed for administrative decision support. These strategies cannot be implemented with external information alone. They rely on the integration of internal and external information. An information manager transfers content in terms of the precision and quality of information needed by the individual in his or her specific programs and activities. Success or effectiveness also lies in the value of services and client satisfaction rather than the size of collection, number of items loaned, or materials used. Information is considered in its broadest definition and includes numeric data, graphics, and motion pictures as well as still pictures and audio. Transfer of content, rather than storage medium or form, is the main concern.

For example, if an administrator is studying SAT scores he/she is more likely

to want data on current students from an internal system integrated with data from an external system. In this example, the information manager needs to go beyond locating the data to actually finding, manipulating, synthesizing, and preparing the data for use.

David Blair distinguishes between physical access and logical access to information. "Consider a library: discovering where the book with a call sign QA76.A1A84 is in the library is a problem of physical access: the discovery of which book in the library will be likely to satisfy a particular information need is a problem of logical access."[13] We have tended to focus on physical access rather than problem solving. We have left the job of information finding to the user or client and have mistakenly assumed that if a user left the library building with a printout, book, or journal, we had done our jobs.

Computing centers have concentrated on making computing cycles and software available as well as facilities for manipulating and transferring data. Today, libraries and computing centers increasingly are combining their services to make information in all forms available, retrievable, and useful.

"In an environment where users are retrieving, manipulating, and using information on a computer, understanding the context of the user's need is essential."

Often librarians do not have or do not take the time to learn about the user's need and its content. The implicit assumption is that someone wants a book or journal article for the sake of having it rather than using it. In an environment where users are retrieving, manipulating, and using information on a computer, understanding the context of the user's need is essential. In an unpublished study by Patricia Dewdney, she noted that "librarians reported that although they were reluctant to ask users such questions directly, they also always found a description of the user's situation and objectives to be extremely helpful for understanding the kind of information or material needed."[14] Knowing the nature of the user's context and how information will be used is crucial to managing information and providing services of value. Providing information in the appropriate format is also essential. For example, if a user is doing a study on foreign trade, the need may be more effectively served if data are delivered in machine-readable form rather than as a printed page requiring data entry.

The management of information did not emerge as a concern until computers and software made it possible to store and retrieve all forms of information in digital form—text, numeric data, graphics, images, and sound. Information users can retrieve and manipulate all forms of information at a PC or work station. They can bypass the library completely in finding needed information. Universities have installed or are installing networks to facilitate the transfer of large amounts of data from internal and external computers to and from work stations or PCs. Computer centers have been and will continue to provide the means of data storage, retrieval, and manipulation. Raymond Neff points out that

> Computers are supremely efficient at symbol manipulation. With suitable communications capability, they can store, retrieve, borrow and lend information at the command (that is, request) of the user. In short, computers can do all that a library can do. Under user control, computers can do even more: They can be programmed to rearrange and edit text, they can exhaustively search for particular phrases, they can compare two or more information items, and they can synthesize diverse information from many sources. Thus, the computer can make information dynamic, whereas the library can only make it available.[15]

Many campuses have built or are building information infrastructures to handle the storage, retrieval, manipulation and transfer of data and information. This infrastructure includes computers of all sizes, cable television, PCs, work stations, printers, plotters, software, data files, telecommunications, audiovisual production, and libraries. Ideally, these elements

will be integrated to provide a broad range of services and training. Historically, the units responsible for these activities have been separate and competing.

Integration of some of the elements often occurs because the units report to one person. In a few instances, some of these units report to the library director. More often, colleges and universities are appointing chief information officers or vice-presidents of information technology who have broad responsibilities. Linda Fleit devised the following position description for the "computer czar":

> Responsibility for all high level decisions involving technology on the campus including, but not limited to, computers of all sizes, shapes and manufacturers, telephones for communicating everything from local campus gossip to star wars research data, networks, (local, inter-university and intergalactic), videodisc technology involving computer assisted instruction as well as yesterday's episode of "Search for Tomorrow," all office automation and if there's time left over, administration of both mail services and all of the campus libraries.[16]

Librarians often are overlooked when policy decisions are being made about information technology and services. In some instances, librarians passively resist involvement. In others, the library is considered a book depository and not an active partner in information services. Nonetheless, libraries and computer centers are collaborating increasingly in information transfer. These collaborative efforts are resulting in more innovative and closer working relationships. More effective systems will emerge when computing people and librarians set aside their individual goals of selling computer cycles and books and collaborate to work on client problems.

CLIENT SERVICE

While information is a unique product and students and faculty are unique clients and users, libraries are not unique in the arena of service organizations. Is the goal of an academic library high circulation statistics? large collections? satisfied students and faculty? Is library service the interaction of a user with a machine or system or the interaction of a client with a librarian? These questions are difficult to answer. Our faculty often measure our quality by the size of the collection relevant to their individual needs. Students often are satisfied if reserve materials are readily available or if they find documents needed for a term paper with little time or effort.

We have tended to treat students and faculty as book users rather than as clients who are coming to us for our professional knowledge and skills. Library users often have relatively low expectations of service because they have been conditioned to find things for themselves rather than be provided with professional services. Often people succeed in spite of the library or the system, not because of them. For libraries to make a difference and contribute to success, goals need to be centered on providing services to individuals.

Customer satisfaction is a relevant term that relates the value a library customer receives from a transaction to expectations. Some readers may object to the use of the term *customer* in a library context, as it implies purchaser and smacks of business, commercialism, and profit. Librarians usually do not think of themselves as business people or their libraries as commercial establishments. Most people who come to the library do not pay directly for use of material or services received. The fee for service is paid indirectly from an appropriation by the institution. Because the use of materials and services are provided free to people, they don't have to make an explicit judgment about value relative to cost. They do make judgments about value relative to expectations and the results of a transaction.

"Customers are satisfied because you have made them better. . . . What satisfies customers is the improvement they see in themselves, in their capabilities, their productivity,"[7] in their knowledge and ability to solve problems and make decisions. This satisfaction is the goal of information management. The necessity of providing quality services to library customers will increase as colleges and universities compete more vigorously for students and faculty and computing centers

expand their information service offerings. The business literature is dealing more with the issue of quality as the United States loses markets and its economic leadership in the world. The critical issues for U.S. industry and libraries are quality, service, and reliability.

We can learn much from the experience of the airline industry. Since deregulation, service on domestic carriers has deteriorated to the point that our expectations are lower than they were ten years ago. Everyone has an airline horror story involving delays, poor meals, uncomfortable seats, and rude or condescending treatment. What are the airlines doing to earn your business? Since libraries no longer have a monopoly on information provision, what are we doing to earn the business of students, faculty, and others? In some colleges and universities, the answer is that not enough attention is being paid to the provision of services.

Karl Albrecht has defined the seven sins of service as apathy, brush-off, coldness, condescension, robotism, rule book, and runaround.[18] Librarians have been guilty of some, if not all, of these sins. Some library favorites are coldness, condescension, and rule book. Reference desk librarians often project an attitude of coldness that says "don't bother me." They appear to be uninterested in the problems or needs of the person on the other side of the desk. They don't take the time to ask about the context of the information need or the form of output desired by the customer. They serve collections, not people.

Librarians often treat people as bad and unwashed children instead of valued customers. They use library jargon and get angry when the customer does not understand the language. They sometimes underestimate the intelligence of their users or deny the validity of the individual's problem.

Rule book may be the librarian's most prominent vice. We love rules and policies and seem to thrive on strict adherence. We use rules as an excuse for not providing service rather than as a means for facilitating service.

In information management, rules are flexible, not rigid. Each client is treated as an intelligent individual with valid needs. The client is treated as a person who is spending time, energy, and resources to seek our professional advice and know-how.

John Guasperi has stated, "In the final analysis, perceived quality is the only quality that matters, since what the customer perceives is what the customer receives."[19] Quality should be the starting point of library service or information management, not an afterthought.

INFORMATION AWARENESS

A quality approach recognizes and acts on the uniqueness of each person's information needs. It recognizes each person's capabilities, knowledge, and limitations without condescension.

When dealing with students, we have a large agenda that goes beyond traditional courses in library usage. We need to extend our programs to develop information awareness and instill the practices of information finding and lifelong learning.

Research studies have recommended that the nation's approach to learning be changed at all levels. We must prepare our students to live in an increasingly competitive, complex, and changing world. We must prepare them to function effectively in an information age and to be competent citizens and consumers. The success of the information age will be determined by the ability of students to find, obtain, analyze, synthesize, and integrate information and knowledge into their personal and professional lives.

Until recently libraries have been passive in educating students about information. While bibliographic instruction has helped students find books and articles for term papers, it has not increased information awareness or significantly changed general information finding skills. We continue to doom our children to be victims because we have not motivated them to seek information and learn. At the college and university level, we often encounter students whose curiosity was stifled by earlier school experiences. We teach and preach rather than tackle the issues of motivation and information literacy.

While students learn to write term papers, they do not learn about information in their disciplines or that information exists to help them make everyday decisions about health, travel, buying automobiles, and seeing worthwhile movies.

The first step in promoting information awareness is to teach students the value of information to their course work and daily lives. Using online databases related to academic programs expands the student's knowledge in the discipline and awareness of information in general. At Georgia Tech, an information awareness program funded by the W. M. Keck Foundation included courses in information for electrical engineering, management, and chemistry. In management, students accessed data online for use in finance, marketing, and other courses. They used source databases as well as bibliographic databases. After they completed the information course they knew how to find, retrieve, download, and manipulate data for their courses.

Students in electrical engineering learned how to find standards, specifications, and patents needed for senior design courses. They also learned how to retrieve abstracts of journal articles, technical reports, and conference proceedings.

All courses included modules on copyright; how to use the Official Airline Guide online, and how to find movie, book, and product reviews.

The courses have been successful because they have involved content related to the students' needs. The courses also involved individual instruction and course-related projects. Students have requested that the information courses be given at least twice a year so that demand can be satisfied.

Each entering freshman class will have more and more students who are experienced computer users. In many school systems computer use begins in kindergarten. As public and school libraries install online catalogs and provide machine-readable indexes, the number of students who have used card catalogs and paper indexes will decrease. It is not clear whether these students will be information literate. "To be information literate, a person must be able to locate, evaluate, and use effectively the needed information. . . . Ultimately, information literate people are those who have learned how to learn."[20] Despite the growing use of computers in schools, it is not clear whether entering freshman will be more information literate or prepared for self-motivated, self-directed learning. As the ALA Presidential Committee on Literacy stated, "Textbooks, workbooks, and lectures must yield to a learning process based on the information resources available for learning and problem solving."[21] Given the state of public elementary and secondary education today, it is doubtful that students will enter college with the skills needed to learn. Information literacy will not result from traditional courses on how to use the library. The learning process must build on students' computer skills and desire to know.

FUTURE DIRECTIONS

Information finding and use are changing in all academic institutions. In many colleges and universities librarians are leading in the design and development of information systems. In others, the computing center or media center is the lead unit. Librarians have an opportunity to use technology and the knowledge and skills of computer people and others to provide information systems and services tailored for individuals. In moving toward information management, it is necessary to recognize that each academic institution has a unique culture and each academic library has a unique clientele. Each library must set its own missions and goals within the context of the parent institution and the needs of its clientele. Robert Taylor points out,

> The kinds of people who make up the clientele or customers of an information system are an important element in describing the environment . . . different classes of professionals need and use information in quite different ways and indeed have differing interpretations of information, its delivery, structure and utility. This is not just a matter of content, but rather, that the kinds of problems and kinds of concerns that one professional group has are quite different from those of other groups.[22]

"We have much to learn about how different groups think, learn, and use information."

An information system designed for civil engineers is not likely to be effective for historians or psychologists. Library information systems are used by all professional groups with little or no tailoring to individual concerns, cognitive styles, or ways of using information. Successful design of systems and interfaces for individuals or groups of individuals will not be easy or quick. We have much to learn about how different groups think, learn, and use information. We will have to change our thinking and habits so that we are sensitive to individual styles and actively learn about them.

A logical first step is to tailor current services to individuals. This step involves shifting emphasis from product (book, journal, etc.) to process and from access to the provision of information. It also involves working with individuals to guide them in the management of their own information or databases. Service in the process or management mode is similar to the work of an attorney or physician and relies on the use of specialized knowledge, education, experience, interpersonal communication, and data to help a client solve a problem. An attorney observes client actions and behavior, queries the client about the problem and the circumstances of the problem, gathers data, synthesizes information, and recommends a course of action. Similarly, a librarian queries a client and learns about his or her problem, the context of the problem, and desired result. After synthesizing and analyzing these data, the librarian may deliver information, software, or instruction or recommend a course of action to the client. The professional/client relationship does not involve handing a ready-made product over the counter; rather, it involves a process of learning, analyzing, and responding to the individual. This process will yield greater value of service and some of the data needed to begin to customize information systems and services. It will demonstrate how the same information is used by different people in different ways. The process is expensive and time-consuming but well worth the investment in terms of the value of service provided and the value of information derived.

Another by-product of this interactive process is gaining greater understanding of how different forms of information representation (video, sound, graphics, numerics, etc.) satisfy different people and different needs. While the computing center can manage hardware, software, and data transmission, librarians are experts in managing content. In a new environment, we must broaden our concept of content to include all forms of information representation. James May has written:

> The task of the university information center of the future will go beyond linking user and information in the library. It will also go beyond access to the campus computer center software and databases. . . . The integrated university information center will have to provide information to the user when and where that person needs it from whatever source is appropriate—the library, computer center, video sources or gateways to off campus resources. Increasingly, the user will expect information to be delivered remotely and promptly at an intelligent integrated workstation.[23]

While librarians in collaboration with computing centers and other units work to bring these new systems into being, print will not go away. Books and journals will continue and multiply. People are not likely to read fiction, history, or philosophy from a screen. Books, journals, and magazines are browsable and portable. Libraries will continue to buy and house books. While we will continue to buy current issues of journals in paper, we are not likely to bind and store the paper. Back issues may be stored on optical media or other devices. We may access them locally or remotely. We will continue to subscribe annually to current journals but probably will pay for older material on a per article basis. Paying for each article may be less expensive in the long run than the cost of new buildings and binding.

The problems cited by writers fifty years ago—preservation, the need for environ-

mentally controlled space, resource sharing, cooperative collection development, and protection of intellectual property rights—will continue for many years to come. During the next fifty years, we will learn how to provide information services that change the lives and contribute to the success of our students and faculties. We will innovate, take risks, and make mistakes.

Fifty years ago, Carl Milman urged librarians to experiment. Long-distance telephone and television were experiments that changed our lives. They did not succeed in the first test. We must not allow fear of failure to block our creativity or be an obstacle to experimentation and risk taking.

We can avoid the symptoms of "technostress" by learning about technology, its capabilities and its limitations. We have demonstrated that we can successfully manage change. At the same time, we can blend the old and the new, preserve the past and chart a course for the future, and maintain our traditional roles while implementing new ones. Our traditions give us a strong foundation on which to build and add services. Vartan Gregorian said,

> The libraries carry our nation's heritage, the heritage of humanity, the record of its triumphs and failures, the record of man's intellectual, scientific, and artistic achievements. The libraries represent humanity's collective memory; they are not repositories alone. They are instruments of civilization; they provide tools for learning, understanding and progress. They are sources of information, yes, but they are sources of knowledge, wisdom, and action. They are laboratories of human endeavor. They are windows to the future. They are sources of hope, self-renewal, self-determination, autonomy, and—to use a new word—empowerment.[24]

We have an obligation and responsibility to preserve the records of humanity's achievements, failures, history, and culture. We also have an opportunity to make a difference in people's lives. Technology has empowered librarians, but we must understand the difference between teaching and learning, means and ends. Our major task in academic libraries is to provide empowerment for the individual and to create the means for the development of curiosity, intellectual inquiry, intuitive thinking, and lifelong learning.

REFERENCES

1. Harvie Branscomb, *Teaching With Books: A Study of College Libraries* (Chicago: Association of American Colleges and American Library Assn., 1940).
2. A. F. Kuhlman, "Introducing College and Research Libraries," *College & Research Libraries* 1:7 (December 1939).
3. Harold L. Keupp, "Probable Trends in University Libraries," *College & Research Libraries* 1:57 (December 1939).
4. National Center for Education Statistics, *Digest of Education Statistics* (Washington, D.C.: U.S. Department of Education, 1988).
5. Louis R. Wilson, "The Role of the Library in Higher Education," *School and Society* 74:585–92 (May 7, 1938).
6. Frederick P. Keppel, "Looking Forward, A Fantasy," in *The Library of Tomorrow*, ed. Edith Miller Danton (Chicago: American Library Assn., 1939), p.1–11.
7. Carl H. Milam, "Experimentation," in *The Library of Tomorrow*, ed. Edith Miller Danton (Chicago: American Library Assn., 1939), p.47.
8. Shirley T. Echelman, "Why Do Academic Libraries Get Such a Bad Rap?" *Library Journal* 113:40 (October 1, 1988).
9. Herbert T. Brinberg, "Content, Not Quantity . . . Tailor Specific Data to Specific Needs—New Thrusts of Information Management," *Management Review* 70:8–9 (December 1981).
10. Ibid., p.9.
11. Donald A. Marchand and Forest W. Horton, Jr., *Infotrends: Profiting From Your Information Resources* (New York: Wiley), p.125, 134.
12. Harvey L. Poppel and Bernard Goldstein, *Information Technology: The Trillion-Dollar Opportunity* (New York: McGraw-Hill, 1987), p.59–60.

13. David C. Blair, "The Management of Information: Basic Distinctions," *Sloan Management Review*, 26:15 (Fall 1984).
14. Brenda Dervin and Patricia Dewdney, "Neutral Questioning: A New Approach to the Reference Interview," *RQ*, 25:508 (Summer 1986).
15. Raymond K. Neff, "Computing in the University—The Implications of New Technologies," *Perspectives in Computing* 7:15 (Fall 1987).
16. Linda H. Fleit, "Choosing a Chief Information Officer: The Myth of the Computer Czar," *Cause/Effect* 26–30 (May 1986).
17. Mark Hannan and Peter Karp, *Customer Satisfaction: How to Maximize, Measure and Market Your Company's Ultimate Product* (New York: Amacon, 1989), p.xiii.
18. Karl Albrecht, *At America's Service* (Homewood, Ill.: Dow Jones-Irwin, 1988), p.14.
19. John Guaspari, *The Customer Connection: Quality for the Rest of Us* (New York: Amacom, 1988), p.53.
20. American Library Association, *Presidential Committee on Information Literacy: Final Report* (Chicago: American Library Assn., January 1989), p.1.
21. *Ibid.*, p.14.
22. Robert S. Taylor, *Value-Added Processes in Information Systems* (Norwood, N.J.: Ablex, 1986), p.38.
23. James May, "The Integrated Information Center," *Cause/Effect* (July 1986), p.15–17.
24. Vartan Gregorian, "In Praise of Libraries and Librarians," *The Research Libraries Group News* 15 (January 1988).