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ABSTRACT

The future role of libraries will develop as a consequence of social, technological, political, economic, and educational factors that are evident today, including: (1) the development of an information society and the question of paper versus paperless means of transmitting information; (2) the growing use of micrographics, telecommunications, videotex, and home computers; (3) the copyright issue and the need for a national information policy; (4) seriously limited library funding levels, the development of fee-based information services, and the information equity question; and (5) the scope of information careers and the types of degrees obtained by information professionals. These factors indicate that libraries will play an active support role in the future. Historically the three main functions of a library have been to collect, preserve, and retrieve information. Fundamental changes are occurring in library procedures due to networking and the development of online cataloging, interlibrary loans, acquisitions, and information retrieval. A cooperative network of resource sharing libraries will probably evolve in the future with service, not storage, as the primary library function. An extensive bibliography is included. (Author/ESR)

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THE ROLE OF LIBRARIES IN AN INFORMATION AGE

by

Robert W. Duttweiler

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THE ROLE OF LIBRARIES IN THE INFORMATION AGE

Robert W. Duttweiler

ABSTRACT

The future role of libraries will develop as a consequence of social, political, economic, technological, and educational factors that are evident today. These factors clearly indicate libraries will play an active support role. A cooperative network of resource sharing libraries is foreseen with service, not storage, the primary library function.

INTRODUCTION

What role will libraries play in the coming Information Age? What social trends, economic factors, educational developments, technological advancements and political realities will influence the transition from the present library system to the one of the future? To be able to see the trends and to make projections, a firm understanding of the present role of libraries in our lives and in our society is necessary.

Historically, the three main functions of a library have been to collect, to preserve and to retrieve information. The flood of information now being generated has made each of these tasks more difficult and, at the same time, all the more important. As technical knowledge is applied to acquisition, organization, storage and retrieval of information, a true reformation of the libraries capacity to serve may occur.

Similar to the dramatic effect printing had on illiteracy, information technology will free man to better understand and control his world. Whether this future function is provided through a library, or directly accessed through a database, is irrelevant to the user. Information services, at least for the near future, are bound to remain within a library framework based largely on the fact that an extensive library system is now in place with established social, financial and political ties. Even the best information alternatives will require a good deal of development time.

As we attempt to see beyond current facts, we need to restrain our enthusiasm for the future and temper it with present realities. The possibilities have been greatly expanded by computer technology, yet the future is often not as imminent as first thought. Libraries are like many contemporary institutions that are gradually changing their role so they may become an important part of a new highly technical society.

Our society has transformed itself from an agricultural economy to an industrial economy and now is developing into an information economy. This highly technical society relies on education and libraries to produce workers capable of functioning in an increasingly specialized, quickly changing world. The quiet, passive, museum-like library of the past is, of necessity, becoming an active advocate of, and participant in, the information society. Our perception of the institution may be lagging behind the reality of its transformation.

TRENDS IN LIBRARY SERVICE

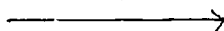
"New Systems
and Services"

On-line Cataloging

On-line interlibrary loan

On-line Acquisitions

TRADITIONAL
LIBRARY



On-line Circulation



FUTURE
LIBRARY

Bibliographic Database Searching

On-line Catalog

Networking

PRESENT ROLE

Collection, preservation and dissemination of information are truly functions of all libraries. Technology is causing fundamental changes in how libraries approach these duties. Automation is allowing greater control over the purchasing and manipulation of information forcing a re-evaluating of many library routines.

If the specifics of how libraries wish to define themselves in the twenty-first century is somewhat unclear, it is partially due to the transition that all segments of our society are undergoing. How will the library's role change in the coming years? Present trends in library service are good indicators of the future.

The central trend is the sharing of resources. So much information in so many fields is being requested by individuals in all parts of the country that the only sensible solution is cooperation. While this is not a new idea, automation is promoting a more efficient form of cooperation. A clear trend, therefore, is the conversion to new technologies to encourage joint ventures.

Profound change has occurred due to the introduction of the simple photocopy machine. It has the power to provide multiple copies of information at low cost, allowing the original to be kept available for each new request. Copyright infringement aside, photocopying has inexpensively increased the flow of information. Facsimile transmission, (the electronic transmission of information), transcends the physical limitations of photocopying.

Microforms are also becoming more firmly established in the library world. They are cost effective, improving in quality (color is now on the market) and should continue to become more prevalent as a media for storage. Whole library collections are now being distributed in microfiche.

The application of computer technology to library functions is just now taking hold after a gestation period of about ten years. Shared on-line library cataloging is already wide spread and further automation relies on a collection being in machine readable form (MARC). The trend is toward the production of COM (Computer Output Microform) catalogs, the traditional card catalog produced in microform. The logical following step is for this information to go on-line, be easy to retrieve and accessible at many locations.

Computer network systems that maintain records of holdings for thousands of libraries provide the basis for the automated national interlibrary loan system. This has streamlined the process of sharing information and acts as a backup for economically pressed libraries. The trend will accelerate in the direction of networks. One example is the concept of cooperative acquisitions state university systems are now considering. Realizing they are tied on-line to each others holdings each institution could plan to buy extensively in certain subject disciplines. The sum will be greater than the parts as duplication is reduced and greater depth of resources is provided to all.

Commercial acquisition subsystems are now in place and approaching economic feasibility. Instead of the traditional paperwork system used in ordering resources, material may be ordered

through the same national computer system that provides cataloging.

The trends we are discussing are true future indicators for they are all now operational and growing in use. System development is a progression in which each step in automation builds on the previous levels. A totally manual library system will quickly, possibly in this decade, be bypassed to the extent that it will have difficulty cooperating with on-line networking libraries. Automation is spurred by this reality.

Control over circulation is also a function ready for automation. Cost is again the main obstacle yet larger libraries are developing or buying commercial systems and the days of manual check-out are numbered. Serial check-in is also a labor intensive function that may soon be priced within the limits of many library budgets.

Finally automation is quickly entering library reference departments. Computer access to 'bibliographic' information is now cost feasible for almost all size institutions. It is an individualized service that allows libraries to function in a manner impossible in the past. This valued service will grow in the library community as well as commercially through what are called fee-based information brokers.

Technology is expensive. It not only effectively duplicates previous functions but expands capabilities. Funding of library automation needs to be reevaluated with federal and state monies used to help establish cooperative systems that can not possibly be funded at the local level. States are examining the purchase of computer facilities that would serve statewide library needs.

Again the trend is towards cooperation and centralization of resources, clearly sharing computer space is most productive.

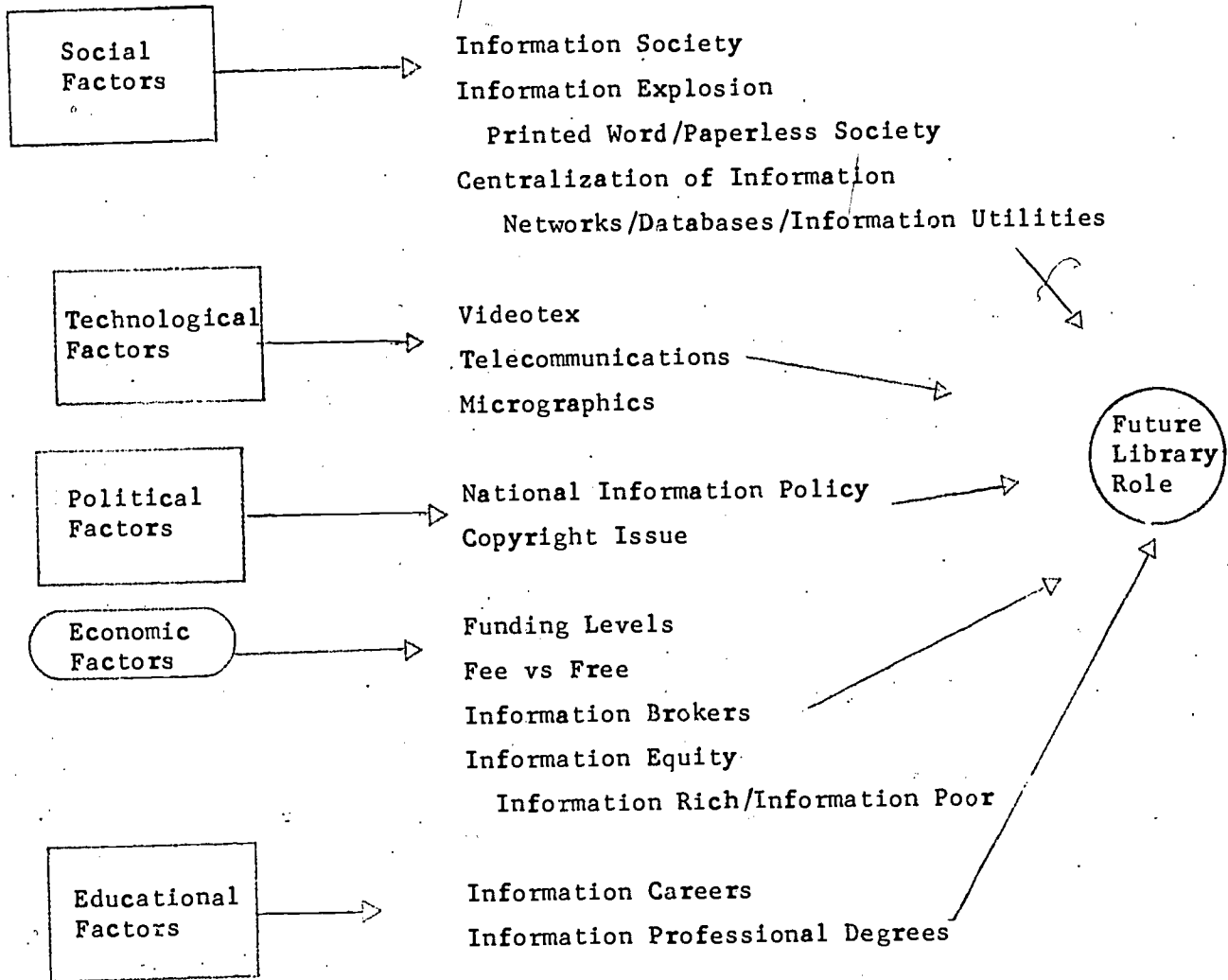
The need for state and national networks is self evident. The specialized information required by our increasingly complex society should act to spur the growth of cooperative efforts. Economic, technological and political barriers do exist. Large library networks are already being termed 'utilities'. For information to be processed effectively, a public information utility needs to be realized and supported.

FACTORS AFFECTING CHANGE

Having indicated the role libraries play in our present society and the direction they are headed we now need to look at the factors that may influence the future. New systems and services indicate an obvious progression into the future yet it will be economic, social, political, educational, and technical factors that determine whether a trend is realized.

The interplay of these factors are so intertwined that a look at general topics (the future of the printed world, telecommunications in the year 2000, information careers, national library and information policy) is necessary for us to be able to have a feel for the direction we are headed. Out of the discussion of each of these issues will emerge a view of the future, the problems in obtaining the information society and ultimately, the place of libraries in this new alignment.

FACTORS INFLUENCING
THE FUTURE ROLE OF LIBRARIES



SOCIAL FACTORS

The information society is upon us. "No new technological break-throughs are required for this transformation. The devices are already available and have begun to move into homes, offices and factories."¹ This new economic order based not on material goods but information will bring structural dislocation as we adjust to the new economic base.²

The future of the printed word, the futuristic 'paperless society', is a good starting point. The very nature of how information is most frequently handled will have a great impact.

The current trend is towards more paper information being consumed rather than less. "Communicating by means of words and pictures pressed on paper persists in this electronic age, and is likely to continue, for a very simple reason: it works, and works well, in many situations---including some where elaborate technologies do not."³

A description of a newspaper in technical jargon drives home the gap between working reality and the paperless, electronic ideal. "It will carry 30 million bits of information, weighing less than three pounds, handle both text and graphics, be completely portable, be accessible in any order, operate 24 hours a day, cost less than .25¢ a connect hour and be mostly paid for by someone else (the advertizer)."⁴ Cost alone argues against a quick conversion to electronic information.

The future is not an either/or decision. The combination of 'paper-electronic hybrids' offers benefits neither one alone is

able to. The capacity to store and manipulate information through a computer with the capability of 'printing-on-demand' does combine the best features of both.

The future library will walk a line between print and electronic media. A collection of heavily used titles will continue to be purchased in paper form for this format backed by photocopying is most cost effective. Access to electronic media, stored really anywhere in the world, available by dial up access, will supplement the core collection.

Electronic transfer of information is an important, growing concept which will come into its own in the coming decade. This does not imply print media will quickly become less important. Much of the new technology, for example word processors and intelligent copiers, simply enhances the efficiency of the production of printed word.⁵ The immediate future will see a more efficient use of print and a shift in careers to operate these new devices.

TECHNOLOGICAL FACTORS

CAMIS (Computer Assisted Makeup Imaging System) systems exist with the ability to transform libraries. "The expenses of storing, packaging, shipping, handling, shelving and taking inventory of large stocks of printed materials could be virtually eliminated."⁶ Pressure from both the publishing and library worlds should bring about implementation of this technology if pricing, billing and copyright problems are resolved.

The federal government is in a position to lead the way by using CAMIS to "disseminate public information and research more efficiently and at lower cost..."⁷ The electronic age may need to wait as information goes through one more developmental step. Just as libraries are acquiring and storing information in microforms (micrographics) the federal government's depository program is well underway towards distributing material in an inexpensive microfiche rather than more costly paper. Micrographics is the intermediate step that will grow in this decade.

The advantages of micrographics include reduced storage space requirements and faster retrieval of information. Micrographics are married to computers thru COM (Computer Output Microform) or CIM (Computer Input Microform). There is some human resistance to the use of microforms, but as clarity improves and color is added, we should see wide spread application of this inexpensive technology.

Libraries will increasingly move toward micrographics, especially for archival storage. It is easily duplicated, has a longer shelf life than paper and, of course, requires little space. Microfiche reproducers (microfiche to microfiche copiers) are becoming more common in libraries. They provide users with very inexpensive (.10¢ - .25¢ fiche) copies of documents, the only restriction being the need of access to a microform reader.

While the future of printing and the publishing industry seems firmly ingrained for the near term, it is telecommunication (the substitute of electrons for paper as the medium of communication)⁸

and its speed of application and acceptance that will drastically alter our lives and workplace. "In the past 20 years technology has mostly been applied within libraries to rather routine inventory control and recordkeeping activities. At some future date many of the traditional artifacts handled by libraries will themselves give way to alternative electronic forms and access to them will depend on telecommunications. When this happens, of course, the whole concept of 'library' could change rather drastically."⁹

This would be the step beyond ~~and~~ mode publications with material only available in machine-readable forms. The feeling is that the print market is saturated while the on-line access market has great potential and is as yet really untapped.¹⁰

The pace of this transition is indicated by F.W. Lancasters forecasts. He believes that by the year 2000, 50% of existing indexing/abstracting service will be available only in electronic form. By that year, 50% of existing reference books and 25% of existing periodicals, and by 1990 50% of newly issued technical reports will be produced only in machine readable form.¹¹

The implication is that 'total' conversion will take a great deal of time. Indexes, technical journals and reference sources will be converted first. Economics will determine what and how quickly conversion occurs. It is already widely felt that leisure reading will be the last to survive printing format. "For this reason, public libraries and school libraries are likely to be affected much less by developments in the next 20 years than those libraries-academic, government, industrial that deal with research material."¹²

The introduction of information services directly into the home on a fee bases will fundamentally restructure our society. Initially the type of product offered, (yellow pages, investment services, shopping at home, reservations, banking) should not affect libraries profoundly. The pricing of these expanded services and the over all willingness of customers to pay for ~~information~~ will, in the long run, mold the role of future libraries.

Videotex is a new industry that is projected to link 8 million homes in the United States, with computer data banks, by 1990.¹³ Some of this country's largest corporations are confident that a profitable home information industry is taking shape and they want to be a part of it. The major road block at present is the inability to identify the services users will pay for and the pricing they will accept.

"It appears that potential videotex customers seem to be most willing to pay for financial services, many of the first systems are expected to be built around transaction processing."¹⁴ Twenty percent of all United State retail sales by 1990 will be done by videotex. Classified ads such as real estates listings and job openings may find videotex a superior medium to the traditional section in newspapers. Electronic yellow pages may also be immediately marketable.¹⁵

What does this mean to libraries? Movement will be in two distinct areas. Home access to information will rely on the offering of a wide range of services requiring support of a mass market. Specialized information, althouth at the forefront of

being processed into machine readable data bases, will not be a major part of this new home information market. It will continue to be accessed through information specialists at the researcher's work place or through libraries.

The home computer terminal has the potential to completely restructure our lives. In the education field CAI (Computer Assisted Instruction), computer tutors and courses taken at home could revamp our educational system. As with libraries, there is a major gap between the possible and the probable. People might work at home on equipment hooked into a central facility having electronic access to company files and needed work information. Movement of the workplace into the home would be revolutionary. Shopping, banking, consumer and sales information provided through a home terminal may be the first realistic step in the home use of computer terminals. Entertainment, (such as video libraries), calendars of events, weather, news and ticket reservations are all possibilities that are already in the works.¹⁶

POLITICAL FACTORS

The copyright issue is a political factor that will affect the flow of information. Similarly, federal regulation will directly influence telecommunication trends. CATV was, until recently, limited by governmental dictate. New communication systems will have "to overcome the tendency of regulatory agencies to freeze the telecommunication systems into some historical pattern that is becoming obsolete because of technological change."¹⁷ Copyright and regulations are component issues within the idea of an information policy.

A discussion directed toward a national information policy is needed in establishing the future role of libraries. A proposition claiming "All information must be available to all people in all formats conveyed through all communication channels and delivered at all levels of comprehension"¹⁸ is absurdly broad. If libraries are to play an important role in providing our nation's information needs, they must set a path that is reasonable and can be supported through proper funding.

"Historically libraries the world over evolved as separate entities acting in terms of individual, institution self-interest."¹⁹ The effective sharing of resources through automated networks could build into a new national role for libraries. We need to develop "information as a national commodity - a valuable resource with the vast potential of affecting the course of our government and well being of all our people."²⁰ Our country's future lies in the development of a national information system that works in the public's interest by disseminating information where it is needed. This system could be built upon a cooperative library system if libraries are willing to overcome local self interest and see the importance of their national role. Commercial private sources of information will supplement this information system but they will naturally provide only that material which is profitable. The libraries of this country, joined through technology, are now in the position to play a national role in our transformation into an information society.

"America needs a plan for the information age on the scale of effort we made to put men on the moon."²¹ The United States is threatened by international competition in its effort to be

the technological leader of information revolution.²² Paul Zurkowski of the Information Industry Association makes the case that information is money is power.²³ An information policy that aids in the development of a nationwide information system is crucial to our economic well being.

ECONOMIC

The major force affecting libraries may be seriously limited funds. "Austerity forces us to re-evaluate what we have always taken for granted and to do those things which are the most important."²⁴ The shift towards the office of the future, the growing understanding of the need for information resources management, the re-evaluation of roles and user needs, all stems out of the economic reality that funds are limited and technology and improved management systems may help provide the answer.

This is a wonderful opportunity for libraries to establish a more precise role. "Money simply is not going to be available in sufficient quantity to continue doing everything we have done in the past nor to do things in the same way."²⁵

The idea that information is valued to the extent that it may be a source of revenue for hard pressed libraries took a new turn with the introduction of computerized bibliographic searching. Providing the same services fee-base information brokers were selling, libraries faced the issue of fee vs. free.

Philosophically, libraries have seen their role as providing services free of charge. Taxes and tuition were collected to

support libraries but individual users did not have to pay user fees for direct access to information. Libraries did charge for many special services (interlibrary loans, book reservation, overdue fines, photocopying). To offer traditional services free and to charge for new specialized services is frequently the policy.

Pricing is an economically viable way to expand and improve some services. It is not the answer to libraries budget problems, but, as a supplement to general tax or tuition revenue it is a reasonable solution. The reason fees are not a final financial solution is the fact that as soon as a library service becomes profitable that service will be duplicated by commercial vendors. Governmental departments, although they appear to be withdrawing somewhat from information dissemination, will take over the distribution of practical information if there is a clear, vital public demand.²⁶ This leaves libraries providing important, often specialized information that does not have a large enough clientele group to make it commercially profitable.

"A free democracy depends in no small measure on maintaining an appropriate balance between the centralization and decentralization of information and knowledge."²⁷ Libraries could play an important part in seeing that information continued to be decentralized, that the 'information poor' have a safety valve of access to material through at least one public institution.

It is not just industries directly related to information, nor just libraries, that will be affected by the coming 'information economy'. It will be the organizations that see the trends and adjust that will survive. Library trade journals show a

realization of libraries changing role in a new world. The question remains does this institution have the resources, human and financial, to bring about a fundamental restructuring of what, by definition, is a conservative institution?

"The imposition of fees will prevent certain users from availing themselves of services that would benefit them, widening the gap between the information rich and the information poor."²⁸ The question of information inequity is within the realm of library concern but clearly not within its power, at present levels of funding, to solve.

The debate will continue, but, by economic necessity libraries will turn to user fees in specialized service. More research libraries will establish fee based information centers to sell to outsiders the product they provide free to their faculty and students. The real question is how libraries will respond as more and more of the information under its control becomes highly valued? Will it take the lead and market this information to provide itself with a firmer monetary base or will it revert to being a storehouse, providing information on demand?

EDUCATIONAL

"The profession of librarianship must separate itself from the institution of the library...the word librarian carries a great deal of semantic baggage and presupposes working in a place called a library."²⁹ "We must move from a 'Ptolemaic' universe with the library at the center to a 'Copernican' world view with information at the center and the library but one of the satellites."³⁰

A failure to participate in the whole information system (with a growing range of careers) will isolate libraries and librarians even more. To be educated to think only in terms of a library is a disservice graduate programs can not afford to perpetuate. If the Masters in Library and Information Science degree fails to meet societies needs new programs will replace the outdated degrees. The Masters in Information Resources Management degree (Syracuse University) may be a forerunner of this new program, an indication of innovation in graduate education.

The new information profession may be defined as having these abilities: "The design, operation, and management of systems and services for the creation, organization, movement and use of messages relevant to the needs of any defined group of people."³¹ Professional library education realizes the need for change, as reflected in the renaming of programs to include 'information science.' They also realize they "have unique and significant knowledge, skills and attitudes,"³² that have the capability of restructuring the profession. The ability to organize data, an awareness of information resources, capabilities in a range of information technologies, an understanding of the human component of information systems and services all are skills now a part of the profession that, if developed and honed, could transform library science into an information science professional degree of the future.

These skills will be incorporated into an information professional degree program. Whether schools of library science

take the lead or programs develop separately many of those who today are called librarians (plus many others with computer science and technical backgrounds) will become the information specialists of the future.

Libraries, being a small part of the information sector, will be transformed by the larger entry. Library Science programs, within the next twenty years, may be incorporated into the information degree. This new Information Science Degree could have many career paths; library science could be a concentration within the larger program. The emphasis on information, combined with a new professional degree program and new information career titles may have profound effect on libraries. This traditionally conservative, women dominated, low paying field may lose all three of these characteristics. Technology is already overcoming conservative tendencies forcing major decisions concerning change. As the field requires and obtains more technically trained individuals, pay scales will be forced higher and male/female ratio will come in line with other similar information careers. The future of the library is very promising. Whether it leads the way or is pulled into its new role, the value of this institution is so great to our economy and our country that it will be transformed or recreated elsewhere.

Those individuals who are the most enterprising are now taking their library skills out of libraries and into personalized information services.³³ This is a trend that could indirectly help the library profession if a wider understanding of the value of their skills developed into the opening of career opportunities outside the library.

As we approach the future, a division along technological lines may develop in the library world. University research libraries will step out front providing services and hiring information specialist with technical backgrounds. Just as medical, law and many special libraries are now setting stricter professional standards, special libraries will recruit the information science graduates. School libraries, public and small academic libraries will be on the fringe of change. If the traditional library science degree continues as a separate program, it will be to provide graduates for these traditional jobs.

FUTURE ROLE OF LIBRARIES

The future is "shaped by countless, relatively independent, individual decisions... future libraries will evolve from present libraries through specific corrections and improvements introduced into the existing structure and framework."³⁴

The question is not whether libraries will survive—they will exist for our life times barring an unprecedented acceleration of human change. The question is how will they be structured during our lives, what role will they play, will we see the growth or contraction of this institution?

"Some scientists have envisioned a future automated, monolithic, comprehensive store of information vastly superior to and totally replacing all present libraries."³⁵ The idea of one huge computer storing all man's knowledge and accessible to all, at home, for a nominal fee, is futurism taken to a nice, neat unrealistic conclusion. "What seems to be disregarded in most radical prophecies

is the essential complexity of libraries and their pluralistic institutional environment... libraries of the future must evolve from present libraries through a step-by-step process of criticism."³⁶

Louis Branscomb, Vice President at IBM, envisions three future paths libraries may take: 1.) new services could appear through automation that improved productivity 2.) new services of sufficient value to charge user fees could provide additional income to libraries 3.) or new services could be offered commercially competing with the traditional library. He sees the third choice as most probable. Private industry is discovering the increasing marketable value of information. "Our country will have to get accustomed to much higher prices for it in the future, as it has with energy in the last decade. Cheap information and cheap research libraries are going the way of cheap energy."³⁷

All three of Branscomb's projections are occurring today with prospects for the private information industry especially bright. Is it realistic to believe this new industry will replace library services, other than in very lucrative markets? Information services are largely built upon online access to private databases. This is still a very costly proposition especially when compared to paper sources. Even projecting dramatic price reductions, it may be a decade before the most heavily used 'indexes' replace their paper counterparts totally. The belief that hard text information, provided at a fee by private industry, will soon replace the established library is farfetched especially when it is understood that videotex (or full text) is just beginning. Costs are prohibitive and it will take some time to alter individual information gathering

patterns.

Information brokers themselves realize that the national network of libraries is the resource for information. These brokers are centered near major research libraries and have access to other libraries around the country. Libraries and information brokers are much alike, the division comes over money. Libraries, historically underfunded, are freely supporting a business prospering off its resources. At some point it may be forced into charging them fees or vigorously entering the fee based information business themselves. Information is money is power and libraries, especially a national network, have great information resources. Nonprofit organizations rarely are economically in a position to lead but they will adjust to new times.

Libraries will indirectly benefit from the success of commercial services. Information brokers, the selling of information, will grow and prosper in the coming years. They will offer expensive specialized services that publicly supported libraries could never provide. This is not a threat to libraries, rather a privately funded professional service making full use of information bought at public expense. Information brokers may be the first in line lobbying for increased library materials budgets.

Dean Galvin supports the idea that libraries are the logical institutions to serve an important role in our 'information society'. We need to make the general public aware of the crisis in information and persuade national policymakers that it is cost-effective and a national priority to expand the existing library structure.³⁸ This network of libraries is in place and through technology is beginning to share information resources at an impressive rate.

To try to replica this system, either privately or through public funds, would be prohibitively expensive. To upgrade the nation's library would, in comparison, be modest and affordable, especially if a national information policy were instituted providing an overall coordination and direction.

The national problem is not one of limited information. "America has an abundance of recorded information, not a shortage. However, this precious resource is concentrated in relatively few locations, often virtually untapped. Thus the challenge is to find the means for making these resources available to more people through an effective identification, location and distribution system."³⁹ Information management is the issue. The answer is an information network built on library resources, public analysis centers and supplemented by private ventures.

"There is a danger that those responsible for the financial support of libraries will neglect or prematurely abandon traditional libraries in favor of more glamorous alternatives in promising, but as yet untested or even nonexistent, technologies.⁴⁰ Present experience with information technology should have taught us that advancements take longer in development, are more costly than projected and come in unforeseen patterns.

We are seeing the beginning of the end for libraries and librarians as we know them.⁴¹ This is advantageous, for as the emphasis shifts from having and perserving material to accessing and communicating information the profession will be transformed. The real question is whether the profession will change rapidly enough to assume its new role in an information society?

Although not usually perceived this way libraries are institutions of change. Doubling in size every 16 years is a rate of growth that forces constant change.⁴² Out of a desire to serve and the necessity to survive they will change, they already are.

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FOOTNOTES

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