LIBRARIANSHIP FOR THE YEAR 2000: 
A SOCIO-TECHNICAL PERSPECTIVE

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ABSTRACT

This paper presents a schema of future librarianship for the year 2000. Existing socio-economic and technological infrastructures are examined to explore the nature of librarianship in relation to the changing needs of the Information Society. Key components of librarianship in both horizontal and vertical dimensions of skills and competence are identified. Also emphasized is a high level of flexibility on outlooks and attitudes to handle multiple tasks and initiate future directions. Parallel to that, democratization of library structure becomes necessary to accommodate greater diversity and responsiveness.

Introduction

"A library degree, by itself, will not be sufficient" precisely captures the insight of Deanna B. Marcum, Dean of the School of Library and Information Science at the Catholic University of America. In fact, both library educators and practitioners are increasingly aware of the changing phase of librarianship shaped by information technologies and social demands. The proactive role of librarians to define and re-examine their professional destiny is widely recognized. In academic and research institutions where innovations and technologies rapidly advance, rising expectations from library users become difficult to accommodate. The mounting pressure and constraints on libraries have, however, provided a

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healthy platform for fruitful discussions. Recent literature has portrayed prominent models and projections on library development toward and beyond the year 2000. This paper intends to serve as a supplement to the multitude of futuristic ideas while capturing a socio-technical perspective of librarianship from the viewpoint of a beginning practitioner.

Socio-technical Schema of Librarianship

The basic schema of future librarianship can be represented by a series of interactions between the socio-economic infrastructure, technological infrastructure and librarianship itself. As indicated in Figure 1, the two-way arrow between socio-economic and technological infrastructures suggests strong reciprocal interactions. Socio-economic activities, while depending heavily upon technology, also inspire and motivate technological advances in the form of market demand. These two forces, when taken together, shall redefine and reinforce the scope and depth of librarianship toward the year 2000.

Figure 1: Socio-Technical Schema of Librarianship
Socio-Economic Infrastructure

As a result of cumulative economic growth and scientific progress, the emerging society in the 21st century will undoubtedly be information-based. Information and knowledge hold the key not only to socio-economic success but political preponderance. The recent Gulf War and the Kremlin Crisis exemplified the unique role of information and intelligence service in political and military endeavors. As it turned out, fast and accurate information fared better than traditional hard weapons. Information and knowledge champion the perpetual cause of human sensibility and intelligence, the cultivation of which almost mandates an unlimited exchange of ideas and imagination.

The transformation of an industrial society to an information society resembles, to a certain extent, the transition from agricultural economy to industrial economy. Characterized by a changing composition of work force and economic market, modern society is moving away from production-oriented goals to resource management activities. During the last two decades, highly industrialized nations like the United States have witnessed declining employment in agriculture and industry while seeing unparalleled growth in the service and information sectors. More than 50 percent of the U.S. work force is employed in the information industry and engages in a wide range of economic activities, such as computer engineering, systems design, library support, telecommunications networking, TV broadcasting, teaching, legal and financial consultation, and the like. With insatiable demand for quality access to information, consumers of information products constitute the essential driving force behind the thriving information industry.

Technological Infrastructure

The Information Society derives its fundamental strength from advanced technology. Technology motivates social changes by offering society and individuals options and possibilities not previously thought of, which in turn stimulate further demand for technological explorations. While progress compounds daily in all aspects of science and technology, four areas of development pertaining to information technologies are especially important. These include computer hardware and software, user interface, expert systems and artificial intelligence, networking and telecommunications.
Computer hardware development has witnessed momentous breakthroughs over the decades. The microprocessor, the brain of modern microcomputers, for example, has been and will continue to be the focus of research and development. In 1991, Intel's 80486 microprocessor operated with 1.2 million transistors and 40 Mhz clock rate. However, computer experts project by the year 2000, Intel will be producing a 80786 microprocessor with 100 million transistors and a clock rate of 250 Mhz. The exponential growth of computing capacity revolutionizes both the dimension and magnitude of product research. Recent developments in multiprocessing, parallel computing and Reduced Instruction Set Computers (RISC) have laid ground for advanced computing applications such as Digital Video Interactive (DVI), graphical user interface, speech synthesis, and voice and image recognition.

A new era of computing has emerged through enhancement of user interface. User interface involves the design and implementation of consistent, simple and intuitive tools and mechanisms to assist users in information retrieval. The "desktop" metaphor of modern graphical user interface, e.g. Macintosh, Microsoft Windows, etc., creates a friendly and easy-to-learn environment. Advanced image processing, computer vision and speech recognition represent succinct modelling of users' cognitive activities to facilitate productivity in information retrieval and knowledge assimilation. Recent laboratory experiments with "virtual reality" in which individuals "dwell in" an electronic world of speech, vision, locomotion and touch endow profound implications to future electronic libraries. It is not inconceivable that future libraries will be able to offer patrons "electronic" experience of exploring the surface of Mars or witnessing the crucifixion of Christ. Dynamic human-machine interface has reached new heights and spanned new perspectives beyond the figments of imagination.

In a similar vein, artificial intelligence and expert systems offer promising prospects in revolutionizing information flow. Effective modelling of human cognition multiplies machine capability of handling routine production work and creative thinking process. Robotics and neural science research demonstrate the caliber of sophisticated machines far beyond the common conception of them as a linear extension of human tools. Despite cumulative progress in the study of artificial intelligence over decades, past profundity of the issue has not yet allowed major breakthroughs. There is, however, tremendous potential in the use of artificial intelligence and expert systems in organizing information resources and customizing information.
tools. In fact, some libraries have reported successful experiments with expert systems particularly for reference services.3

The concepts of networking and resource sharing draw their fundamental strength from advanced telecommunications technology. Satellite dish, fiber optics communications, broadband transmission, standardized communications protocol, distributed electronic databases, voice mail, bulletin board, facsimile, on-line searching, local area network, and the like represent numerous options and potential opened for expedient information access across local, regional and national boundaries. Information disseminated at prime time with top quality becomes essential in monitoring all aspects of economic, social and political development.

Librarianship 2000

The emerging views of the Information Age call for dynamic skills and attitudes to ensure smooth change in transition. New standards of competence, broad horizons of world view and multiple dimensions of knowledge are indispensable for individuals and society to attain universal progress. Librarians who act as gatekeepers of knowledge should persevere in their efforts to expand the information frontier by consolidating the scope and depth of their skills and training.

Elements that constitute future librarianship can be analyzed in terms of horizontal and vertical domains, which in essence epitomize desirable skills, competence, attitude and style of librarianship for the year 2000. Horizontal competence measures information skills, computer knowledge and subsidiary training while vertical competence measures the depth of subject knowledge.

Horizontal Competence

The horizontal dimensions of librarianship are illustrated in Figure 2. As previously discussed, computer knowledge and information skills form the foundation of future librarianship. Significant advances in information technologies have revolutionized the concepts of libraries and information management. Functions of libraries are gradually transformed from one of traditional depository to electronic access and dissemination. Daily library operations to acquire, organize and disseminate information and knowledge become heavily involved with computer systems and program design. On-line catalogs and database searches support remote log-on and
end-user services. Intelligent reference systems operate independently to assist reference work. Outside the libraries, bibliographic utilities, commercial vendors and various local and regional consortia help to promote the concepts of resource sharing and networking.

With library operations and computer technology inextricably related, librarians need to establish a broad base of computer knowledge. Although the levels and aspects of computer involvement may vary along traditional demarcation of public/technical services, a fundamental understanding of computer and information technologies among practicing librarians is indispensable to an autonomous development of the library profession. The recent merger of the Stanford University Libraries with its computing center suggests rising competitions among information workers in a new age of information dissemination.

![Diagram of Horizontal Dimensions of Librarianship](image-url)

Figure 2: Horizontal Dimensions of Librarianship

Computer literacy thereby constitutes the primary domain of horizontal competence. As suggested earlier, computer hardware and software development, user interface, telecommunications and networking,
artificial intelligence and expert systems form the technological infrastructure of the Information Society. A fundamental knowledge in these areas pertaining to library operations and management are important to identify the focus and directions of library development in light of technological potential. Professional training in the design and maintenance of library automation systems, for example, serves better to coordinate library hi-tech development from the perspective of librarians than that of computer scientists. Experience in planning and installation of LANs and campus-wide library computing facilities enhances the status and autonomy of libraries within academic institutions. Active participation in cooperative networking and consortium projects consolidates the basis for resource sharing.

There are other dimensions of horizontal skills aside from computer knowledge. Financial, analytical and interpersonal skills, for example, should be highly emphasized to improve the management and communication aspects of librarianship. Provision of bibliographic instructions and customized information services increasingly requires knowledge in user behavior, user modelling and adult learning theory. Familiarity with statistics and cognitive science research is also important to foster scientific research efforts in library science.

On the other hand, traditional library skills in cataloging and acquisitions which can be streamlined by automation and delegated to support staff should be less emphasized. As more libraries are contracting out cataloging and retrospective conversion projects to commercial vendors and bibliographic networks, many catalogers are freed to work on planning, coordinating and managing the projects. While some may view this as a sign of de-professionalization of catalogers, others see this as a challenging transition from mechanical production work to dynamic management of information resources. The shifting tendency from "make" to "buy" for bibliographic and other library products changes the essential character of librarians' jobs. The production-oriented approach and over-specialization in routine operations are less prevailing while job rotations and dual assignments become more popular. The traditional distinction between public and technical services is blurring. Reference librarians are learning more about catalog files' structures as catalogers learn more about on-line searching. Integrated library automation systems help to dissolve traditional departmentation practice by effectively streamlining operations and succinctly relating one to another. Inter-departmental knowledge becomes highly desirable in supporting the flexibility and suppleness of future librarianship.
Vertical Subject Expertise

In addition to horizontal competence, librarians also need strong subject background to function effectively as expert information providers. In an academic environment, librarians bridge the information gap and become part of the education and research team. Corporate librarians integrate information for decision-making and strategic planning. With increasing demands for customized and packaged information services, it takes more than information retrieval skills to achieve maximum customer satisfaction.

Vertical subject competence involves an in-depth knowledge of a subject discipline, usually obtained through an advanced degree or graduate studies. An undergraduate subject major, while it may be sufficient in meeting the general information needs of some school and public libraries, will not adequately serve the instructional and research needs of the academic and research community.

To understand the challenging transition of academic librarianship, we need to examine the changing focus of higher education institutions. Colleges and universities have long been entrusted with the roles of preserving, transmitting and creating knowledge. While teaching and instructional tasks remain prominent in most institutions, research and development activities have gained equal footing in major universities in the United States. Many research projects sponsored by government agencies and private corporations have contributed to breakthroughs in knowledge and scientific discoveries. Though the autonomy of academia is safeguarded by laws and traditions which minimize outside political and commercial influences, close ties between universities, government and corporations resulting from cooperative research efforts will undoubtedly persist. The university's role in knowledge creation will become paramount.

Academic and research libraries share the missions of their parent institutions. The support for instructional, research and development activities requires quality and quantity information which is well organized, packaged and delivered. Librarians with subject expertise are increasingly in demand for interpreting specific research topics for faculty and students and supplying them with selective, customized information. As witnessed over the last decade, the "quantity" aspect of information access has been significantly improved by electronic databases, on-line searching, document delivery, CD-ROM networking and many other sophisticated information
tools. However, the "quality" aspect of information interpretation and communication, which requires more than surface human intervention, has left much to be desired. Researchers and teaching faculty often deplore the lack of subject expertise among librarians who, as inexplicably perceived, claim collegiate status in academic rights and governance. Faculty status and tenure systems are considered privileges granted to scholarly contributions towards creation of human knowledge. Librarians, unfortunately, are often categorized by teaching faculty as everything from "secretaries" to "technicians". Computer technology which supports direct end-user services has diminished the intermediary role of librarians and demystified their gatekeeper image in knowledge transmission. Knowledge of information tools will no longer be sufficient to define future librarianship. Recent focus on bibliographic instructions and user interface development helps to create sophisticated users who are well-trained in the use of information tools. The role of librarians in support of research and teaching, therefore, will evolve gradually towards teamwork and partnership with faculty and students held by a common bond of subject expertise. Librarians' hard-won battle for faculty status and learned scholarship will bear significant fruit if their expertise and contributions are recognized and respected by their teaching counterparts.

Librarians' Outlooks and Attitudes

As a result of conscious efforts to substantiate knowledge and skills, librarianship for the year 2000 will be very much characterized by a proactive client-centered approach and library professionals will stay competitive by an extension of horizontal competence in computer and information skills and a consolidation of vertical competence in subject skills. The optimal integration of skills and knowledge, however, cannot be achieved without parallel breakthroughs in librarians' outlooks and attitudes.

Subjective and objective criteria alike often point to the fact that librarians are mostly conservative. Indeed, traditionally librarianship has been a relatively isolated, stable and conservative profession. Librarians are generally perceived as kind, helpful, moderate and quiet people. If there is ever a revolution, it will never come from a library. The library is a place to preserve, to conserve and to conform. There is not much room for flexibility or entrepreneurship.

In recent years, however, library innovations have brought about some visible changes. Librarians have strived for better access to outside
exposure, such as teaching classes for bibliographic instructions, conducting research with teaching faculty, coordinating work with vendors and computer professionals, attending workshops and conferences, and the like. Librarians have become more liberal in adopting changes in response to changing user needs and outside competitions. They are also more concerned with access than ownership, material use than materials themselves, information management than bibliographic production. Increasingly, librarians have developed flexible and multiple working styles to accommodate both teamwork and independent work. Adjustment to environmental changes and user demands warrant a wide outlook with a risk-taking attitude, which, in the author's opinion, should be consciously nurtured and encouraged among practicing as well as new librarians. Indeed, the best and the brightest, with first-rate problem-solving minds and entrepreneurial attitudes, are crucial human resources essential to the continuing survival and prosperity of librarianship in the 21st century.

Library Organizational Structure

It is frequently suggested that participative management and collegiate governance work best with a decentralized, non-hierarchical library structure. More often than not, flatter organizational structure minimizes red tape while encouraging direct, open communications. Within a library, new technologies like electronic mail help to democratize information access through personal computers and break down artificial barriers of traditional departmentation. However, it is not so much of a technical issue than a psychological and political issue that often stands in the way of structural reform and rejuvenation of libraries, especially in large academic and research libraries. As suggested by a study group of the Association of College & Research Libraries, a smaller environment like a college library is more likely to implement a collegiate, non-hierarchical style of operation while in large research libraries, fundamental hierarchical pattern is likely to persist. This is a dismaying situation as fundamental changes in skills and technologies must be matched by compatible improvements in organizational structure. A library characterized by structural fixation, a territorial outlook and an intolerance to diversity and differences is unlikely to survive in the long run. Libraries of the 21st century, on the other hand, will embrace the essential qualities of progressive open-mindedness practiced through participative management, collegiate governance and decentralized, non-hierarchical operation.
Conclusion

To summarize, the essential schema of librarianship for the year 2000 is defined by a balanced development in the skill/competence dimension as well as the attitude/style dimension (Figure 3). Existing socio-economic and technological forces hold a special future for librarianship. However, future and success are contingent upon hard work and dedication. Conscious efforts on the part of librarians to move forward are thereby critical to ensure brilliant prospects for librarianship for the century to come.

Figure 3: Skill and Attitude Dimensions
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Additional References

