

“The Impact of the Internet upon the Information Services”,
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The Impact of the Internet upon Information Services: An Overview and Future Prospect

Mei-hwa Yang
Professor & Director
Graduate Institute of Library and Information Science
National Chengchi University

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I. Introduction

Articles about reforming, rethinking, and restructuring information centers are not uncommon. Information profession is caught in a dynamic and changing world where an established culture of permanence, perfection and control is giving way to uncertainty, contingency, and transformation. In this revolutionary era of the twentieth century, the Internet has become a source for gathering timely information at a faster rate for many institutes and individuals. The Internet certainly has affected the management of Sci-Tech Information Center in many ways.

The information world is undergoing a paradigm shift.

II. Organizing Internet Resources

Long time ago, Shera had said that: The responsibility of the librarian is “to maximize the flow of communication across the barriers of time, space, language, and patterns of thought.”¹ Facing the internet resources, the impact upon cataloging practices is as follows:

1. The cataloging practice has following changes:

- i. Catalog’s function: from finding and gathering to identifying, access and directory gateway.
- ii. Cataloging scope: from local and physical to global and virtual.
- iii. Data: from single medium to multimedia , from linear to hyperlink.
- iv. Retrieval result: from bibliographic and holding record to full text.

2. The concept of Metadata - Dublin Core

In March 1995, the OCLC and NCSA co-sponsored the Metadata Workshop and convened 52 selected researchers and professionals from librarianship, computer science, text encoding, and related areas to develop the resource description records for networked electronic information objects.

¹ Jesse H. Shera, “The Librarian and the Machine,” *Library Journal* (June 15, 1961)

Why is it so important? Because it has five functions which will bring impact on the cataloging. They are:

- i. encouraging authors and publishers to provide metadata and that can be collected by automated resource discovery tools.
- ii. creating a template with metadata elements for network publishing tools.
- iii. serving as the basis for a more detailed cataloging record.
- iv. being understood across user communities if metadata become a standard.
- v. becoming a similar MARC device among HTML, SGML, TEI Header, MARC and URN(uniform resource name), etc.

III. Information Searching

The existence of resources on the Internet is an undeniably rich resource. The World Wide Web's search engines are the main tools for indexing and retrieval of internet resources today. However, there are few "signposts" on the Internet to its most important information. One can waste a lot of time "surfing" the net.² That's why we need to learn the searching strategies and do the information filtering for quality information.

When I hear the mantra

**"Anything, anywhere, anytime," I try not to choke
My goal is to have "nothing, nowhere, never,
Unless it is timely, important, relevant or engaging."**

Nicholas Negroponis, in "Tools for the future: recreating or renovating information services using new technologies," by Jane I. Dysart & Rebecca J. Jones, Computer in Libraries, 15 (January 1995)

Comparison and evaluation of their performance is of great importance for system developers and information professionals, as well as end-users.

IV. The Design of WWW Homepage

WWW as a powerful tool, one can use it for publishing as well as marketing. Dave Taylor pointed out 8 rules for the designing:

Rule #1:

² Czeslaw Jan Grycz, "Technological Change and Its Influence on the Practice and Role of Information Management", *The Serials Librarian* 25 (1995):51-52.

Understand the intended users and uses of your Web site then focus the design and layout around their needs and interests.

Rule #2:

Be sparing with graphical elements.

Rule #3:

Pages should load within no more than thirty seconds, including all graphical elements.

Rule #4:

Minimize color palettes.

Rule #5:

Design horizontally-oriented graphical elements where possible.

Rule #6:

Web sites should always be content-centric.

Rule #7:

One qualified visitor is worth a dozen anonymous browsers.

Rule #8:

Ensure your site constantly changes and your information is up-to-date.³

V. Copyright in the Electronic Environment

1. Position of ECUP on User Rights in Electronic Publications

The European Copyright User Platform (EUCP), consists of the 35 Library Associations which are full members of the European Bureau of Library, Information and Documentation Associations (EBLIDA) suggests that without infringing copyright, libraries should be able:

- i. to use electronic technologies to preserve copyrighted materials in their collections;
- ii. to provide on-site access to electronic copyrighted material;
- iii. to provide off-site access to registered users;
- iv. to provide on-site copies of copyrighted material in electronic form or in paper form.⁴

³ Dave Taylor, *Intuitive Systems-Rules for Cool Web Pages*, 1977

⁴ Pre-Conference Seminar, Tianjin, 62nd IFLA Conference, 22-23 August 1996.

2. IFLA Position Paper on Copyright in the Electronic Environment

Librarians are catalysts for the flow of information in a community. They educate users about copyright and the use of copyright protected material.

IFLA believes that :

- i. Librarians are crucial to the access to electronic information. This role needs to be protected and enhanced.
- ii. The lending of published electronic resources by libraries for cultural and educational purposes should not be restricted by legislation.
- iii. Legislation should give librarians and archivists permission to convert copyright protected texts and images into digital format for preservation and conservation related purposes.
- iv. An international agreement on the movement of digital intellectual property across national boundaries is vital to enable an unrestricted flow of information.⁵

3. Digital Future Coalition (DFC) from USA

The Digital Future Coalition was established in Fall 1995 to ensure that the Congressional intellectual property debate is thorough, broad, and balanced. DFC includes over 30 organizations representing high-technology industry groups, library and educational associations, and consumer and privacy advocates.⁶

VI. Resource Sharing and Document Delivery

1. Resource Sharing Project

Resource sharing of digital information resources holds the potential for revolutionary changes in libraries of the 21st century.

The Pacific Neighborhood Consortium (PNC) is an organization formed to initiate and implement a program in computing and communications technology oriented toward maximizing opportunities for information exchange among institutions of higher education in the Pacific Rim. The goal of the Consortium is the development of information exchange capacity to a level that will allow the participating institutions of higher education to regard themselves, not as organizations separated

⁵ 62nd IFLA General Conference, 25-31 August 1996.

⁶ Mary, E. Jackson, "Copying in the United States: Current Developments & Initiatives," 62nd IFLA General Conference, 25-31 August 1996.

by vast distances, but as the residents of a virtual neighborhood.⁷

With this goal in mind, the following problem areas were selected for study:

- (1) The availability and capacity of existing communications technologies; what is currently available; what is forecast to be available for the future; and what will be needed to produce effective and harmonious exchanges among the participants.
- (2) The standards needed to provide effective means of communication, including agreements on character sets, formats and system protocols.
- (3) The resources in the Pacific Rim currently accessible through technology, including libraries, data bases and corpora of texts in technologically accessible form.

2. Commercial Document Delivery

Innovative networking technologies are creating a flood of new commercial information media and services, such as: UnCover, EBSCO, OCLC, Search Bank.

UnCover is a database of current article information taken from 17,000 multidisciplinary journals. Over 4000 current citations are added daily. UnCover contains brief descriptive information about over 7,000,000 articles which have appeared since Fall 1988.

VII. Digital Library

1. Barriers to the Success of the Digital Library

- (1) Reading from the screen continues to be unacceptable to most scholars;
- (2) Work at the remote scholar workstation will be solitary;
- (3) Potential for plagiarism and imprecise attribution increases;
- (4) The digital library is difficult to conceptualize and plan;
- (5) Librarian roles will change dramatically; and
- (6) The costs will be enormous.⁸

2. Responsibilities of Digital Librarians

The Internet presents librarians with the opportunity to apply their established skills as

⁷ PNC (URL: <http://www.pnv.berkeley.edu>)

⁸ "Editorial: The Digital Librarian," *The Journal of Academic Librarianship* (March 1997): 79-80.

educators, information managers, custodians, information providers and change agents in their work with Internet users.

- (1)Partners in Book Production.
- (2)Browser Development.
- (3)Metadata Creation.
- (4)New Instructional Agendas.
- (5)Archiving.
- (6)Collection Decisions.
- (7) Fair Use Guardians.⁹
- (8)Organization of networked information resource.

VIII. Problems in the Electronic Information age

1. Dealing with Technologies on a Limited Budget

Librarians find themselves operating in a “zero-sum economic situation”. Libraries must change or be left out of the process.

2. The Emergence of Information as a Commodity

Information increasingly is being treated as a commodity. The price attached to information is rising. The growing commoditization of information is changing the character of information services. Value-added services, in which the packaging or manipulation of the information provides a justification for an additional charge, are becoming more common.

3. Information Technology Standards for Libraries

Technical standards for libraries have a long history. The National Information Standards Organization was established in 1939 as Committee Z39 in order to design and promote voluntary bibliographic standards for libraries, information services, and publishers. More than 50 standards have been produced since the establishment of Committee Z39, including standards for a common language (Z39.58), an interlibrary loan data element (Z39.63), and international standard serial numbering (Z39.9).¹⁰

Of the standards being developed specifically for libraries, the most important is American National Standard Z39.50: Information Retrieval Service Definition and

⁹ “Editorial: The Digital Librarian,” *The Journal of Academic Librarianship* (March 1997): 79-80.

¹⁰ Christinger Tomer, “Information Technology Standards for Libraries,” *Journal of the American Society for Information Science* 43 (September 1992): 566-570.

Protocol Specification for Library Applications which was first set forth in 1988 and subsequently revised by the NISO.

The Z39.50 standard specifies both a syntax for formulating queries and a general framework for transmitting and managing queries and results. The user of a system that supports Z39.50 connectivity sees remote system as though they were additional database available from the local system.

The Wide Area Information Server (WAIS) protocol developed by Thinking Machines, Inc., will allow for the full exploitation of the MARC format's value to libraries and library users.¹¹

VIII. Implications for Information Centers

Whether librarians accept the changes or not, the public's perceptions of the "information superhighway" will have a fundamental impact on their relationships with and expectations for libraries. The Internet has been compared to "a blistering fast, multilane roadway where the vehicles are traveling in at least three dimensions at once, the directional signage changes all the time, and there are no rest stops." For information centers, Internet development have a number of implications:

1. Competition

New forms of competition for the library are emerging. The related forces of technology and commoditization are fostering a significant growth in private, computer-communications-based information services. Information centers need to use these services to enhance their own service offerings to users, the new services also represents source of competition for information centers. The role of the government producer and distributor, raising questions of competition with the private sector, the legitimacy of private firms profiting from the marketing of government information, and the appropriateness of citizens paying to receive government-produced information generated from tax dollars.¹²

2. Convergence

¹¹ M, Stern, "Browsing Through Terabytes: Wide-area Information Servers Open a New Frontier in Personal and Corporate Information Services," *BYTE* 16 (May 1991): 157-164.

¹² Anne, J. Mathews, "Introduction," *Rethinking the Library in the Information Age*. Issue in *Library Research: Proposals for the 1990s*. Vol. II(ERIC Reports, 1988),p.3.

Technological convergence is creating or fostering institutional convergence. Computer and communications technologies are converging. Parallel to this technological convergence, there is also a functional convergence taking place within the information marketplace among information creators, publishers, and distributors. Self-publishing is increasing. Parts of the library are becoming technically indistinguishable from other information service providers (such as computer centers, instructional communication agencies, and book vendors), while from a service perspective, many of its functions are in danger of being bypassed.¹³

3. Virtualization

Computer allows information to be more easily and inexpensively altered, repackaged, repressed, deleted, networking is making electronic communication a primary feature of the modern information environment. Information is becoming an increasing inpermanent interactive phenomenon.

What is “virtualization”? According to Bauwens “virtualization” means that every piece of information produced everywhere in organization, is accessible from anywhere, anytime.

The Cyberspace is an ideal whose time has come.

What is Cyberspace? Ernel Stepp calls it: “The space of interactive computational possibilities, where computers are available to users of any participating computers, anywhere.”¹⁴ Michael Benedikt defines cyberspace as: “A globally networked, computer-generated, multi-dimensional, artificial or ‘virtual’ reality.”¹⁵

4. Globalization

At the international level, networking is turning information into a global phenomenon. This has several implications:

- (1) It gives rise to concerns regarding the availability and accessibility of domestic or local information.
- (2) It presents major questions regarding the possibility, and the terms, of access by foreign nationals.

¹³ Louis Vagianos and Barry Lesser, “Information Policy Issues: Putting Library Policy in Context” Rethinking the Library in the Information Age. Issues: Putting Library Research: Proposals for the 1990s. Vol. II (ERIC Reports, 1988),p.13.

¹⁴ Ernel Stepp, “The Virtualization of Institutes of Research,” *The Arachnet Electronic Journal of Virtual Culture* 1(1993).

¹⁵ Michael Benedikt, “Cyberspace: Some Proposals”, in *Cyberspace: First Steps* (Cambridge, Mass.: MIT Press, 1991), p.p.199-224.

- (3) It accentuates long-standing concerns regarding the relationship between open information flows and national security interests.
- (4) It presents new concerns regarding individual rights of privacy and the confidentiality of personal records.
- (5) It creates the technical possibility of relocation of information storage offshore, with potential implications for political sovereignty, employment, and income.¹⁶

5. Future directions for librarians

What is the librarian's role as we approach the year 2000? "Cyberpunk librarian" is proposed as a metaphor for the librarian able to operate in the emerging cyberspace. Cyberpunk librarian is a new identity. The cyberpuk librarian may discover that, in a world changing by the second, the best way to keep on top is to stay out at the cutting edge.¹⁷

The alternative careers for librarians include the following role-play:

1. Abstractors
2. Collection Developers
3. Brokers
4. Consultants
5. Creators
6. Database Managers
7. Database Set-Up Contractors
8. Developers
9. Digital Technologists
10. Digitizers
11. Disseminators
12. Entrepreneurs
13. Evaluators
14. Graphics Designer
15. HTML Coder
16. Internet Security Analysts
17. Interpreters

¹⁶ Louis Vagianos and Barry Lesser, "Information Policy Issues: Putting Library Policy in Context" in *Rethinking the library in the Information Age. Issue in Library Research: Proposals for the 1990s*. Vol. II (ERIC Reports, 1988), p.16.

¹⁷ Jonathan Willson, "Enter the Cyberpunk Librarian: Future directions in Cyberspace," *Internet Research: Electronic Networking Applications and Policy* 6(1966): 22-28.

18. Journalists, Electronic
19. Knowledge Workers
20. LAN Administrators
21. Learning Facilitators
22. Market Researchers
23. Navigators
24. Negotiators
25. Organizers
26. Project Managers
27. Records Managers
28. Repackaging Specialists
29. Sales Persons
30. Strategists
31. Systems Administrators
32. Team Leaders
33. Team Members
34. Trainers
35. Virtual Librarians
36. Webmaster¹⁸

X. Conclusion

In “Into the Information Age”, A. D. Little refers to three eras of information services. Era I consisted of discipline-based services designed to help solve the subject-oriented question. Era II was of mission-oriented services for helping accomplish a mission, such as getting a man on the moon. Era III was problem-oriented services to help solve problems, such as pollution. Toni Carbo Bearman believed Era IV should be individually-oriented services, customized for the individual.

In the networked environment, we have a kaleidoscope of choices. We should turn the electronic challenge into our own electronic opportunity.

Hopefully this workshop experience for us is “One small step, one Giant Leap”!

¹⁸ Barbara Best-Nichols, “Technologies Change Organizational and Occupational Structures: Librarian, Cybrarian or ? ”

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