

NEW ROLES FOR LIBRARIANS IN SUPPORTING RESEARCHERS IN THE SOCIAL SCIENCES: THE IMPACT OF NEW TECHNOLOGY*

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Abstract: The use of new technology in social science libraries ranges from extensive use of CD-ROMs and CD-ROM networks, development of databases and production of CD-ROM products, integration of networked information sources into the library's offerings and creating the institution's presence in the World Wide Web, as well as incorporating other network information resource discovery tools into daily library work. These activities not only entail detailed knowledge of database structures and computer use in the field (computer literacy), but also often lead to becoming networking specialists within the home institution, information brokers and systems designers. These new roles often entail developing solutions to overcome platform incompatibilities between various operating systems (PC, Macintosh, UNIX, etc.), making the library OPAC accessible via the Internet, creating a WEB-presence for the home institution on the Internet, providing value-added services to compile and structure relevant accession points in the Internet for specialist areas (subject-oriented clearinghouse principle), developing retrieval mechanisms, and assembling training materials to support the researchers in their use of these new information sources. Since the scope of the information sources available has now expanded greatly to include statistics and other demographic data, data archives, directories and/or overviews of relevant software programs for evaluation, assessment and development of data collecting instruments, etc., new services can be established for both internal and external use. This paper gives an overview of the basic competencies for fulfilling these new roles, and certain new activities for social science librarians and information workers are delineated.

Introduction

Because the structure and content of the social sciences and their information collections are closely interrelated with the social systems of the country itself (i.e., educational system, societal structures, parliamentary and legal system, social services), the organization and representation of the content, including its verbal description, is often very individual. Certain international similarities can be distinguished - which can also in part be attributed to the impact of new technology in both the field itself and in information work. But the high

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proportion of both content and linguistic individuality remains. With the increased use of the Internet, national or linguistic limitations present subject-oriented challenges to the social sciences librarian. These affect not only the methods and instruments used for information retrieval and acquisition, but also the development of value-added services which can place appropriate information in the correct context and provide targeted information in a vastly expanding field. Certain internationalism is prevalent in some subject areas of the social sciences (i.e., psychology), but in general, few technological innovations are able to bridge the individual sociological differences. With the increase of multilingual sources (i.e., sources in the native language as well as in English), greater chances for correlations will be achieved, but as yet these aspects have not yet achieved "break through" status. The primary impact of new technology in the social science libraries is thus in the realm of expanded access to a wider variety of international sources based on access via the Internet on a fairly up-to-date basis. This impact requires network skills, new methods of information retrieval and presentation (or brokering), and often involves the librarian in creating and designing new systems applications to facilitate adequate information services.

Thus, new technology is causing the role of the librarian to be partially redefined as network specialist, information broker, and systems designer, to mention only a few professional directions. Each of these professional directions incorporates segments of the neighboring information professions and demonstrates the nebulous metamorphosis which the librarian profession is passing through, especially with regard to the technical medium in which libraries and librarians are now functioning. In essence, an overall intensification of specialization both in the technological aspects of information retrieval work, as well as stronger subject-oriented competencies and evaluative abilities are being demanded of information professionals. Furthermore these aspects should be also be included both in the restructuring of the training and education of librarians, as well as in in-service continuing education to meet the changing technological demands at the workplace.

The fact that the librarian is no longer only responsible for obtaining information to stock a well-organized library for the research institution and creating access to key information sources in external hosts is nothing new. *How* the librarian, however, is fulfilling his or her tasks of information retrieval and presentation *is* changing with the impact of new technology. The use of new technology in social science libraries began with CD-ROMs, expanded to building up CD-ROM networks, and in some institutions to the development of databases and production of the institution's own CD-ROM products. Now, new technology, namely the Internet protocol, enables the integration of networked information sources even

from different platforms into the library's offerings. This means not only using the Internet as a reference tool, but also providing reliable and relevant access to key locations in the Internet for the researchers in a presentation form that will be most useful to them. Furthermore, it also means creating and designing the library's and often also the parent institution's presence in the World Wide Web through concentrated information presentation and conversion of the library OPAC and other product databases to a form compatible with Internet technology and Internet user expectations. To examine these new roles for the social sciences librarian, first an overview of the basic competencies needed to fulfill these new roles will be discussed, then some of these new activities for social science librarians and information workers will be described, including examples of such activities as they existed in March 1996. Finally, certain implications for the librarians and information workers in the social sciences in view of expanding impact of new technology in this field will be discussed.

Basic Competencies for the New Roles of Librarians in Social Sciences Libraries and Information Centers

The impact of new technology is a cumulative process and requires cumulative acquisition of computer and information structuring competencies in order to manage new technology changes. Computer literacy is no longer a new topic, but has become a prerequisite for all special librarians. Required knowledge of databases has now surpassed knowing the retrieval language and database structure of several frequently used subject-oriented online or CD-ROM databases to include new aspects, such as special traits of individual retrieval components from different hosts for the same database, differences between online and CD-ROM databases or between various versions of the same CD-ROM-database, or basic knowledge of the institution's OPAC.

Required knowledge of database structures has expanded to include various types of structures and formats required for downloading into the researchers' own literature databases, modifying the library OPAC or producing new databases for CD-ROM production, etc. Furthermore, with respect to the impact of the currently greatest instrument of new technology, the Internet, knowledge of database structures extends from using Telnet connections to access remote library catalogs using a wide variety of access and retrieval structures, to the implementation of existing databases into Internet-compatible databases by using WAIS, Harvester, Excite, and other front-end indexing and retrieval programs, or by converting the entire database into a Z39.50, a Hyper-G or similar database which can be

searched directly by Internet users.¹ Hence, knowledge of databases has not only expanded "horizontally" to include a wider variety of database structures, but also "vertically" (somewhat like an inverted pyramid) to include meta-database and automated indexing features which extract information on a controlled or non-controlled basis for search and retrieve purposes.²

Aspects of networking technology have expanded similarly in a cumulative manner. In many institutions without any prior data processing infrastructure, the library was often the instigator for networking the researchers' computers with the library catalog. In other institutions with well-developed computer services and existing network structures, efforts to automate the library had to either comply with existing operating systems (in order to take full advantage of the network opportunities) or build up a parallel, but distinctly separate library services network. This requires knowledge of various operating systems (PC, Macintosh, UNIX, VMS, MSW etc.) and their incompatibilities, as well as of various network limitations. After establishing the appropriate network connecting one or more library services with the researchers' desktop computers or workstations, new aspects of network technology to include access to networked information sources must be taken into account. Knowledge of various operating systems and of the functioning of various library services software (retrieval software for connecting to external hosts, networked CD-ROMS, library databases, etc.) is necessary to solve individual users' problems with memory space, accessibility and customized downloading.

In addition, the new role of the librarian as network specialist within the home institution may involve finding solutions to alleviate platform incompatibilities between various operating systems (PC, Macintosh, UNIX, etc.), as well as creating new networked services for both internal and external use. Depending on the prior or current infrastructure of computer experts in the research institute environment, this may mean anything from individual assessment of disc space needed by various resident programs, advice regarding maintenance and simultaneous use of various programs while also maintaining connections to CD-

¹ For elaboration on making library OPACs available sometimes with extensive active links out of the library catalog, see Hans-Joachim Waetjen: Hypertextbasierte OPAC's im World Wide Web. Presentation at Weiter auf dem Weg zur virtuellen Bibliothek! Bibliotheken nutzen das Internet. Erste INETBIB-Tagung in der Universitätsbibliothek Dortmund vom 11.-13. März 1996} (in press).

² Hans-Joachim Waetjen: Mensch oder Maschine? - Auswahl und Erschließung von Informationsressourcen im Internet. Presentation at the Workshop "Internet-basierte Informationssysteme der Bibliotheken" 15.-17. Januar 1996, Zentrum für interdisziplinäre Forschung, Bielefeld, Germany (<http://web.urz.uni-heidelberg.de/AndereOrg/DFG/workshop/waetjen/index.html>) ; Traugott Koch: Suchmaschinen im Internet (<http://www.ub2.lu.se/tk/demos/DO9603-manus.html>).

ROM-networks, external hosts and information services which rely on various other operating systems. Or it may mean offering multiple versions of the same services (CD-ROMs, library OPAC) for the various operating systems platforms (PC, Mac, UNIX etc.) with the detailed daily or hourly updating required. Or it may turn the librarian into a jack-of-all-trades for downloading, import and export of all sorts of data (not just library-related) into all sorts of target data evaluation structures, making the librarian well-known more for his or her networking, data and information processing skills than for his or her role as librarian. This, however, also belongs to the service orientation of the library or information center and solidifies the librarian's status and indispensability within the research institute structures - especially in an era of down-sizing. These competencies are not particular only to social science librarians, but - as opposed to other academic fields where networked information sources have long been in use - are "coming of age" and gaining in importance as the researchers in these areas are moving to greater reliance on such sources (as opposed to the more technology-friendly and technology dominated natural sciences and mathematical fields).

Even within a research environment where computer resources are very sophisticated and computer specialists are available, the librarian who is thoroughly versed in both the technical and the information possibilities is more in demand for customizing individual work station environment to the researchers' needs than often the computer specialist who has limited knowledge of information retrieval methodology and sources.

Libraries in research institutions which have attained network stability and desktop access for every researcher to the library catalog and other library services provide an important service which enhances the status and technological advantage of the library for the researchers. Nevertheless, precisely because of this expanded information infrastructure for the researcher, the basic function of the library as information center is now being challenged by the mere fact that the networked access to Internet and other networked information sources often provide the means to bypass the library in the processes of information location, retrieval, and acquisition. To persuade users to take advantage of the information provision services of the library or information center, value-added services, greater familiarity with document delivery services, and adequate research support mechanisms offering more than the already available information sources and which are appropriate to the researchers' needs must be developed. Such new, value-added services offer the researchers time-saving, content-relevant and timeliness (currentness) advantages over their own information seeking activities in the Internet.

The impact of new technology also requires the same kind of cumulative growth in the content level which is evidenced by the pressures on the special librarian or subject specialist to enhance his subject knowledge as well as his technological capabilities. Not only is new technology pervading the research work in the social sciences as in most other fields (though perhaps to a less dramatically overwhelming degree), but also the social sciences are very visible within the new information sources being made available through enhanced technology. This increased exposure to the social sciences, however, brings additional problems of incompatibility when directly comparing or even verbally describing social systems of various countries.³ The problems begin at the linguistic level of verbal descriptors. This can extend from difficulties in the translation or description of the terms and their meaning.⁴ But they don't stop there. Because the structure and content of the social sciences and their information collections are closely interrelated with the social systems of the country itself (educational system, societal structures, parliamentary and legal system, social services structures, etc.), the organization and representation of the content often remains very individual, distinctly non-international and sometimes even contradictory. Certain international similarities can be distinguished - which can also in part be attributed to the impact of new technology in both the field itself and in information work. But the high proportion of both content and linguistic individuality remains and with the greater use of the Internet presents subject-oriented challenges to the librarian. This affects not only the methods and instruments used for information retrieval and acquisition, but also the development of value-added services which can place appropriate information in the correct context and also provide targeted information in a vastly expanding field. Thus, the role of the librarian is evolving to network specialist, information broker, and systems designer, to mention only a few directions. In essence, an overall intensification of specialization both in the technological aspects of library and information retrieval work, as well as stronger subject-oriented competencies and evaluative abilities are being demanded of the information professionals

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³ See Peter Wagner, Bjoern Wittrock (1991): *States, Institutions, and Discourses: A Comparative Perspective on the Structuration of the Social Sciences*. In: *Discourses on Society, The Shaping of the Social Science Disciplines*. Vol. XV. Eds. Peter Wagner, Bjoern Wittrock, Richard Whitley. Dordrecht etc.: Kluwer, 1991, pp. 331-357; see also "World Sociology: From National to Global Sociology" *Schweizer Zeitschrift für Soziologie* 22 (1996): 11-24.

⁴ Compare, for example, the meanings of the German "Kindergarten" and "Vorschule" to the American "kindergarten" and "pre-school" in context of the educational and social structures in which they are imbedded.

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Activities for Social Science Librarians and Information Workers

As a result of the integration of networking technology, the librarian may be called upon to create new networked services for both internal and external use. These can include making current contents services available (both from external sources or based on internal journal holdings), making the library OPAC networkable for access via the Internet, contributing to the creation of a WEB-presence of the home institution on the Internet, providing value-added services to select, compile and structure relevant accession points in the Internet for the researchers' specialism (subject-oriented Internet clearinghouse principle⁵, and developing search mechanisms and training materials to support the researchers in their use of these new information sources (statistics and other demographic data, access to data archives, directories and/or overviews of relevant software programs for evaluation, assessment and development of data collecting instruments).

⁵ Such clearinghouses for subject-oriented Internet resources have been compiled in Resource Guides at the University of Michigan (<http://www.sils.umich.edu/chhome/>), by the WWW Virtual Library of the Australian National University (<http://www.anu.edu.au/>), in the BUBL Subject Tree (<http://www.bubl.ac.uk/>), and specifically for the social sciences in English-language areas by SOSIG (<http://www.sosig.uk>). A comprehensive description of the clearinghouse methodology can be found in Diann Rusch-Feja: Ein Clearinghouse-Konzept fuer Fachinformation aus dem Internet, oder wie man aus dem Chaos sinnvolle Informationsvermittlung betreibt. *ABI-Technik* 16(2) (1996) (in press), also soon to be translated into English for publication. See also Diann Rusch-Feja: Structuring Subject Information Sources in the Internet. In: *Wissen elektronischen Netzwerken*. Oldenburg: Bibliotheks- und Informationssystem der Universität Oldenburg, 1995, pp. 99-132. A detailed analysis of the various forms of clearinghouses and similar compilations and indices of Internet subject resources can be found in Diann Rusch-Feja: Clearinghouses als Vermittlungsstellen für Fachinformation im Internet. In: *Weiter auf dem Weg zur virtuellen Bibliothek! Bibliotheken nutzen das Internet. Erste INETBIB-Tagung in der Universitätsbibliothek Dortmund vom 11.-13. März 1996*. Dortmund: Universitätsbibliothek, 1996, pp. 50-66.

In addition, new technology is introducing functions belonging to systems design into the librarian profession. Beyond the systems design for integrating automated library and information systems into the library work routine, new emphasis is now being placed on innovating value-added services based on new technology and which can be integrated into the existing electronic environment. These include creation of meta-databases for both print and digitally-based information sources for retrieval purposes at different user levels, integrating Web-oriented quality management software such as link-checkers, security systems to protect externally offered servers and internal information, adapting Z 39.50 or other automated indexing and retrieval "robots" to make the library database available on the Internet, etc. Most of these are new functions, however, which are not specific to social sciences librarians and extend across the librarians profession regardless of thematic concentration of the library, but are most often found in specialized libraries.

The librarian as information broker must be able to not only find the literature via database references, but he must also be able to find it first, estimate its value, adequately and promptly estimate the user's needs in terms of document delivery conditions and select an appropriate supplier.⁶ Establishing new criteria for determining information quality is a further new aspect of the information broker and the process of information brokering.

The entire field of scholarly publishing will take on new contours. Electronic publishing of research results and scholarly works will also take place via the networks, affecting both library work routines in the periodicals section as well as subscription modes, rates, and a new market for individual articles.⁷ Librarians will be involved in developing adequate down-loading facilities for e-journals for their users. Archiving techniques will no doubt become a joint venture between journal publishers and libraries. New types of billing (pay as you go) and licensing contracts will have to be negotiated. Various versions of journal articles will necessitate varied indexing and cataloging procedures and may change the face (and usage procedures) of library catalogs considerably. And librarians may be involved in the graphic and textual preparation of the electronic publications, becoming themselves Web-publishers.

⁶ See also Frank B. Oliver: *Great Expectations: The Impact of New Technology on Information Access and Delivery*. In: *Electronic Documents and Information: From Preservation to Access*, Eds. Ahmed H. Helal, Joachim W. Weiss. Publications of Essen University Library, 20. Essen: Universitätsbibliothek Essen, 1996, pp. 5-20.

⁷ See also Hermann Leskien: *The Impact of Electronic Publishing on Library Services*. In: *Electronic Documents and Information: From Preservation to Access*, Eds. Ahmed H. Helal, Joachim W. Weiss. Publications of Essen University Library, 20. Essen: Universitätsbibliothek Essen, 1996, pp. 141-148.

Thus far in the scientific community, evaluation of print sources were based on the journal impact factor of the journal in which the article appeared, the frequency and time-span of citations of individual articles, and often contextual information such as inclusion in a thematic issue of a journal, solicited or non-solicited article, length of time between article submission and its publication or between publication date and first citations. Whereas print literature in the English language for major journals in a field were covered by inclusion in Science Citation Index, Social Science Citation Index or Arts and Humanities Index, sources which appear simultaneously in print and electronic journals or solely in an E-journal will either not be fully represented by this process or even completely left out. New systems for establishing "use" and "citation" statistics will have to be developed, as well as new evaluation systems to deal with these in perspective with traditional scientometric citation analyses.

Furthermore, from a systems point of view, the impact of new technology has been to introduce a huge wave of down-sizing in libraries and information centers. As a result, new ways of evaluating services, sustaining important services with fewer staff and resources, and even developing new services to meet new needs of researchers and other users are more and more common in the librarian's professional life. Social sciences libraries are also most often affected, because their environment and object of study is imbedded in social structures which respond rapidly to the economic developments which are directly affected by the integration of new technology (i.e., reduction of jobs, elimination of redundancy in routine jobs or procedural transitions, etc.). Furthermore, social sciences researchers will be relying more and more on sources which formerly belonged to the category "official publications". In particular, these sources are more readily available, often electronically (on CD-ROMs, in Web-Sites, etc.), and free of charge.

Systems design approaches may be helpful in producing routine queries using adequate search engines or other indexing mechanisms in order to obtain the newest documents on the topic being dealt with or to check the validity of links on a clearinghouse resource page. Thus, a systematic design and continuous expansion of profiling techniques depending on the medium (Web, CD-ROMs, online hosts) and incorporating information from several mediums will be necessary to provide adequate coverage and up-to-date information. Here, librarians may find the market of services offered by network organizations useful, or they may find it more useful, depending on the complexity of the profile requirements, to develop current awareness services for themselves and their researchers.

Last but not least, the librarian and information professionals must often be network specialists. In addition to just knowing how to hook up the various technology into the network, the depth and variation of networking knowledge is expanding daily. This includes not only the physical networking technology to connect computers, workstations and peripherals with the central institutional computer, with CD-ROM and other physical information servers at the institutional level and also the integration of various computer technology (PC, Macintosh, UNIX, etc.) within an institutional network. It also includes the networking technology of the Internet Protocol (TCP-IP) and various other aspects of virtual connections with the world wide network of information sources in the Internet and other related networks. In smaller institutions, the librarian may be required to set up or maintain the World Wide Web server, produce HTML-pages both for the library and the institution itself, and set up Internet services such as training sessions, trouble-shooting, and specialized services.

Implications for Librarians and Information Workers in the Social Sciences in view of the Expanding Impact of New Technology

The impact of new technology has only begun to be felt - especially in social sciences libraries. Information resources from the Internet offer greater currency on social problems and background issues which will influence the content of the library's collection policy and require inclusion of electronic journals, current awareness services, document delivery and even ephemeral information from the Internet in reference and information services. Librarians and information workers will have to be familiar with key Internet resources and even provide their own. Clearinghouse services, whereby Internet sources targeted to the needs of the library clientele are selected, compiled, structured, and presented in a HTML-resource page in the institutions server with active links to the URL or to a proxy server, will augment daily reference work. Librarians will help train researchers to use the Internet and its resources, so that in essence, the clearinghouse resource pages will be a joint project with feedback and additions from the researchers, molding it for their particular use. Book orders, interlibrary loan, electronic document delivery, etc., in fact, almost all service aspects of library work, will necessitate knowledge of networking, of key resources, of the cost-benefit proportion of various external services. New electronic resources, such as statistical data, data archives, institutional information, etc., will become more relevant in the library's offerings. Direct support of the research and activities of the parent institution through these new services will contribute to increasing esteem of the library and to building new productive partnerships with researchers dependent on current, focused subject-oriented information.

Conclusion

Thus, the role of the librarian is evolving to network specialist, information broker, and systems designer, to mention only a few directions. In essence, an overall intensification of specialization both in the technological aspects of library and information retrieval work, as well as stronger subject-oriented competencies and evaluative abilities are being demanded of the information professionals and should be taken into considering both in the training and education of librarians as well as in in-service continuing education to meet the changing technological demands at the workplace.

Further Literature

Building Partnerships: Computing and Library Professionals. The Proceedings of Library Solutions Institute No. 3, Chicago, Illinois, May 12-14, 1994. Eds. Anne G. Lipow, Sheila D. Creth. Berkeley, San Carlos, California: Library Solutions Press, 1995.

Wissenschaftliche Information im elektronischen Zeitalter. Stand und Erfordernisse. Bericht der Sachverständigenkommission Elektronische Fachinformation (EFI) an den Hochschulen in Bayern. Bayerisches Staatsministerium für Unterricht, Kultur, Wissenschaft und Kunst. [Munich: Bavarian State Ministry of Teaching, Culture, Science and Art], 1995.

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