Information Technology and Social Science Information Services*

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I. Introduction

Information technology is no longer a vision but a reality. Recent survey says that one out of five people has personal computer at his home or office in Korea, and one out of two in America by the end of 1995. Here is ample evidence that information technology is here to stay. Indeed, computer networks have surfaced on a scale greater than most people realized: local networks, national and international networks. These networks are bringing more and more people into direct contact with information. Information technology has been changing our environment at an ever-increasing rate.

There is little doubt that such information technology provides improved opportunities for accessing information, but realizing these opportunities require knowledge and skills that are not easily acquired and are even more difficult to keep up to date.

Libraries are especially affected by this changing environment. They have a responsibility to acquire the knowledge and skills necessary to use and teach the most efficient information technologies that current technology makes possible. However, the emerging nature of information technology makes acquiring knowledge and skills no easier for librarians than it is for others. Even though budget is available to purchase or subscribe to the latest innovations, radical institutional changes in education and library work routines need to be implemented to fully exploit the potential of new information technologies.

Therefore, this paper discusses the nature of information technology, and impact of information technology on social science information services in general. Also this paper analyzes characteristics of social science information systems and social science librarian's perceptions on information technology, and suggests new roles of social science information professionals in the information society.

II. Information Technology and Information Services

2. 1 Information Technology and Libraries

A new information technology creates a new achievable goal because it provides opportunities to do something previously unattainable. or at least to change or improve upon a process or product. The realization of these new opportunities will usually require social and organizational changes. New

organizational patterns and processes must compete with previously existing social structures. They are implemented alongside existing patterns and eventually may replace all or part of the previous structures.

The effect of rapid technological change is very evident in libraries that have adopted new information technologies. As an integral part of the information environment, libraries have been surrounded by technological innovation for the last twenty years, and the attack has intensified during the last ten. Librarians have been working the front lines in this conflict, which has simplified many individual functions while dramatically increasing the overall complexity of the information work environment.

Computers are by far the most powerful tool ever for handling information. Computers can handle any knid of data that can be represented by symbols. The rapid advance in the development and use of computer technology has contributed to the extremely rapid growth in information itself. Librarians are all too familiar with the fact that "information is being generated faster than libraries are able to organize and store it" (Becker 1979, 409). While older technologies were extensions of a worker's hands, new information technology is an extension of the mind, acting as partner, or even master, to the worker. Earlier technologies converted energy, but information technology converts information which, of course, results in new information.

The increasing use of computers has coincided with a rapid expansion of national and international telecommunications that is providing a very fast, world-wide information system with far-reaching consequences. Large commercial database services have developed that can be accessed from anywhere via microcomputers and telecommunications systems. Add to these database systems the large number of mail systems used by the academic community and the extreme size and rapid growth of the knowledge base make it unwise for a library to attempt self-sufficiency. The long standing notion that a library can grow to be self-sufficient is no longer held to be

valid. Computer and telecommunications technology must be used to form networks to share resources with outside resources. Certainly most libraries have never really been self-sufficient. Interlibrary loan service, telephone calls, letters and visits by scholars and librarians have been long standing methods for resources sharing, but the data/document transmission capabilities of the electronic age have drastically changed the scholar's work and expectations.

As technology changed and the knowledge base grew to enormous proportions, it became impossible for librarians to rely on printed materials within their libraries. As Becker (1979, 411) puts it: "In the past, libraries were doorways to internal collections, but information technology has the power to convert them into windows on the world's knowledge." Libraries should be more than a place to house printed materials. They should be the public's main access point to a network of knowledge containing all types of information in all types of formats.

2. 2 Impact of Information Technology on Social Science Information Services

The existence of information technology has had a great impact on the materials, methods, and conduct of information services. Computer-based information service has expanded subject access, saved librarians' and users' time, and generally improved information service itself.

Social science librarians carry a very heavy responsibility in this process by attempting to guide clients through this information network. They must be familiar with not only the printed sources in the library, but also with numerous remote-access electronic resources. Two basic kinds of online database searching may be identified and discussed in terms of their effect on the information process and on the user: searching of the bibliographic utilities and searching of subject databases created by a variety of commercial database producers.

The earliest major computerized bibliographic tools were the cataloging database of OCLC which was designed as a cataloging rather than a reference information tool. The problems encountered with public access to OCLC were restriction of terminal availability, cost of terminals, fear of machines on the part of public service librarians. It was not until the early 1980s that public service librarians' use of these tool became common in America, neither was at present in Korea.

The other side of the online-searching developed during the 1970s and early 1980s involved the variety of databases created by for-profit and nonprofit companies and government entities made available to libraries primarily through the commercial vendors--principally DIALOG, BRS, SDC-ORBIT and Institute for Scientific Information (ISI) in the social science area.

The long-jam regarding end user access to databases is currently being broken by the implementation of optical disc technology. Such technology offers much of the power and features of online searching at a fixed cost. The amount of searching is open-ended, and the patron can more easily use the simplified search systems without much instruction. While not an online tool, it appears to be a free online searching system to the end user, thus attracting users and potentially expanding information tools to a wider audience. Some claim the impact of CD-ROM to be as significant for information service as online searching was in the 1970s.

Until recently, compact disc information sources have been limited to one person per workstation at a time, are not as current as online resources, and are somewhat slower than their online counterparts. These are not disabling drawbacks, especially in the area of currency; those needing total currency can still go online in most cases. The technology for multiple access to multiple databases is making headway in the market. More serious problems for libraries included the cost of subscription to a burgeonong list of compact

disc resources, the cost of hardware necessary to access these resources, and the space necessary for hardware and user workstations. Some libraries which have acquired optical disc products or are planning to do so are also charging or planning to charge for the use of the systems. Others have cancelled or are considering the cancellation of hard copy resources, such as the Comprehensive Dissertation Index, Social Science Index, or Social Science Citation Index - in favor of the CD-ROM product, just as had been done when bases on online access.

Social science librarians also need to use the information technology found within the library. Most academic libraries now have online catalogs. Many of these online catalogs are part of local networks and may list the holdings of several other libraries. Also stand-alone microcomputers are now used heavily in all areas of most libraries. With the development of CD-ROM microcomputer technology, it is now possible for very large databases, both bibliographic and full-text, to be housed within the library and to be accessed using a microcomputer. Therefore a knowledge of microcomputer technology is important for today's social science librarians. Such knowledge, when combined with a broad-based knowledge of other forms of electronic information technology, should prepare them to participate in the development and effective use of tomorrow's innovations.

III. Research on Social Science Information Systems and Professionals

3. 1 Characteristics of Social Science Information Systems

Although access to information in social science is available through a variety of publications, libraries, information services and data banks, these

services are still largely uncoordinated. The planning and development of new services, and coordination and rationalization of existing ones requires a knowledge of the current state of affairs, which means details about the number, range, and type of services for each major subject, language, and country. The perplexing problem of even conclusively defining the social sciences has been difficult for information providers. In general, there is no single way to define or enumerate the social sciences. They are the fields whose interest contents on observation and explanation of the actions of people in society: what people do and why, and under what circumstances they do one thing rather than another.

The literature of social sciences covers eight fields that have in common a concern for the behavior of man in relation to his fellows and to the environment they share. Foremost among them are sociology, psychology, anthropology, economics, and political science. Geography overlaps these subjects but has its own contributuins to make on interactions between man and the land. Education is more an art than a science, but is included because it draws so extensively on these other disciplines and because of its own research. History has close ties with the humanities.

Then, what kind of information system serves the social science discipline? There have been several suggestions and models. Overall, social science information system should include the areas of knowledge concerned with human beings interacting or acting in groups. This means that it is desirable to have a social science information system as a whole, because the overlap and commonality of the social science disciplines would make such s system desirable due to the wide scattering of social science citations in research reports among the various social sciences. This implys that any really thorough service for social scientists would need to be based on a very large body of material.

Therefore, social science information system should be concerned with the

relationship between three factors: users: types of need: and possible solutions.

Users can be grouped into two basic categories: function and environment. Function may be research, teaching and training, management, social work, the press, politics, business, or study and learning. Environment may be an academic institution, research organization, industry, government, professional association, trade union, or the press.

Types of need may be considered from various aspects: subject content: nature of information--conceptual, theoretical, historical or statistical: quantity of need: processing--the various ways in which information can be presented: physical form of the information: speed of supply: data range: specificity: immediate function: quality: and level.

Solutions to the problem include bibliographies: indexing and abstracting journals: current contents: citation indexes: library collections: data banks: specialized documentations and information centers: SDI: direct access to computer-stored information, and so on.

Recognizing the difficulties inherent in modeling social science information system, this paper introduces a model for desirable social science information services counted upon the information technology. In Heim's model (1983), social science data are characterized as "Ur-documents" at the initial level (Fig. 1). These are the raw materials for social scientific research. Included here are letters, diaries: verbatim proceedings of conferences, trials, or government hearings: video-tapes or films of actual events, data collected by polling agencies. This material is then used by scholars, researchers and report writers at the "Intellectual Transformation" level to generate articles, books, government reports, or analyze polling information to broadcast by mass media. After the intellectual transformation takes place, the Ur-documents are then reorganized in a packaged form: books, articles, reports, edited films, or data tapes with technical documentations.

Indexing and Abstracting Tools(paper & online)
Review Articles
Union Catalogs Monographs and Archive Materials
Referral by Colleagues
Citation Indexes
Bibliographies
(lists of research in progress)

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"UNION LIST" TOOLS

SYSTEM TRANSFORMATION BY NETWORKERS, INDEXERS,
ABSTRACTORS & INVISIBLE COLLEGE

Access Tools	Site
Catalog	Library
Catalog	Paper Archives
Catalog	Data Library

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RETRIEVABLE STORAGE SITE

BIBLLOGRAPHIC TRANSFORMATION BY MONOGRAPHIC AND
SERIALS CATALOGERS, PAPER AND DATA ARCHIVISTS

Book, Journal Articles
Technical Govt. Reports
Datatapes with Technical Documentation

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PACKAGES

INTELLECTUAL, TRANSFORMATION BY SCHOLARS,
RESEARCHERS, REPORT WRITERS

UR-DOCUMENTS
unanalyzed statistics
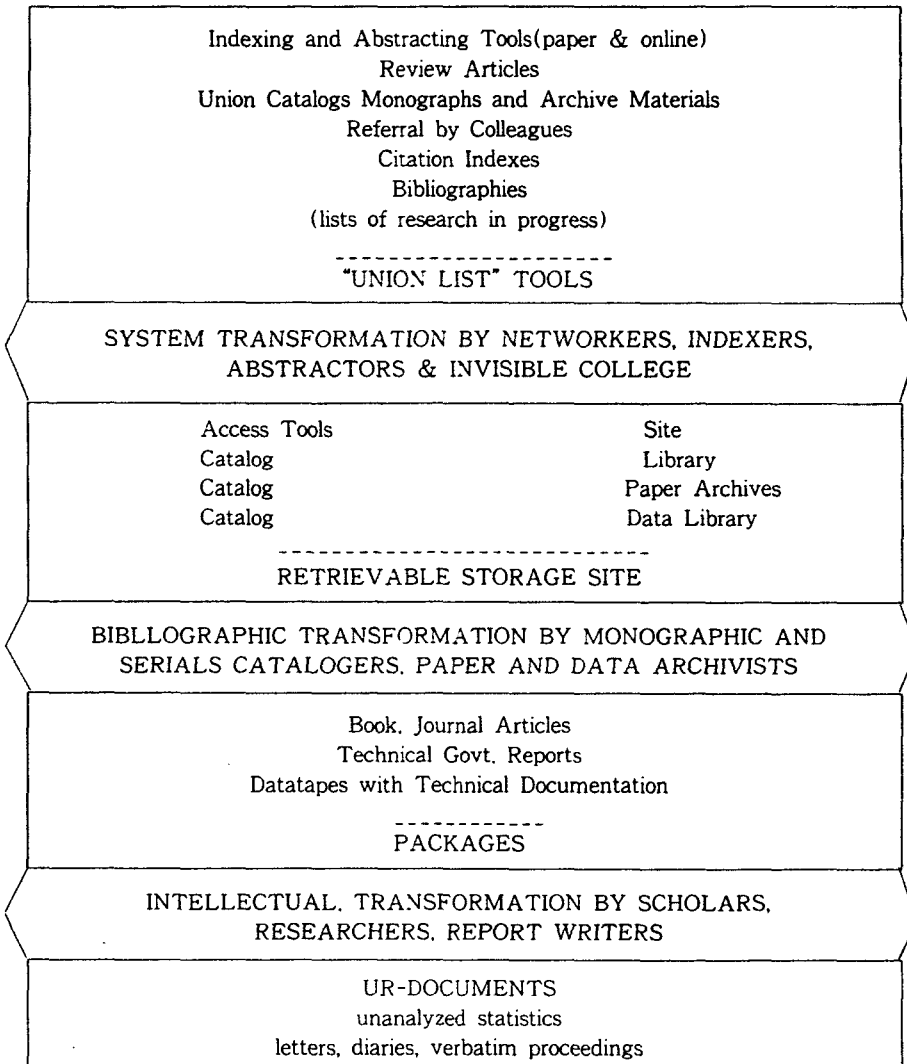letters, diaries, verbatim proceedings

Fig.1 Social Science Information System Source: Heim 1983, 48

These packages are then subjected to a "Bibliographic Transformation" to make them retrievable through local standard storage sites. Librarians will catalog books and check-in serials, archivists will develop local catalogs, and data archivists/librarians will devise access to data through their own catalogs. Once identifiable bibliographically, and thus retrievable at any given local storage site, a "System Transformation" takes place for bibliographic control of the package at a nationally or internationally retrievable level. It is the responsibility of social science librarians to understand this system, especially if they intend to provide for the information needs of the social scientists.

3. 2 Social Science Librarian's Perceptions on Information Technology

3. 2. 1 Description of the Research

A great deal of thought and concern has been studied on the impact of technology on libraries and on the individuals who work there. Information for this research concerning the attitudes and views of social science librarians toward technological change in the library was gathered by means of a questionnaire. The questionnaire was distributed to the librarians, mostly reference librarians and social science librarians, of seven university libraries which started library automation in Seoul, Korea. 130 surveys were distributed and 80 were returned (61.5 percent of response rate). Any statistics mentioned in this research will be given in random order so that no particular numbers or responses can be associated with a particular library.

The survey consisted of twenty questions, in terms of "yes-no," "semantic differential scale," and "Likert scale," some of which required only one answer, but several of which allowed the respondent to check more than one answer if more than one applied.

3.2.2 Results of the Survey

Educational Background

Educational background of the 80 respondents is as follows:

Diploma or degree	No. of respondents
High school diploma	6 (7.5%)
2-year college	18 (22.5%)
Undergraduate	42 (52.5%)
Master degree	14 (17.5%)

Twenty-five respondents indicated that they had participated in miscellaneous training programs or courses. Subjects of these courses included business and management, computer technology, library automation, computer languages, and several others. A listing of the major and minor subjects studies for undergraduate degrees shows a large preponderance of library and information science over other subjects. Of the 80 respondents, thirty-six (45 percent) said they have at some time taken computer or computer-related courses.

Library Work-Experience

Of all the respondents, 86 percent had more than three years's experience working in libraries, and 69 percent of all respondents had more than three years' experience in the library in which they are now employed.

Most of the librarians have experienced the introduction of new information technologies into their work areas and have worked with new technologies for some time. If one postulates that ten years ago very little had yet been introduced in the way of automation, then 36 percent of the respondents have been working long enough in libraries to experience both the virtual

absence of high-tech library automation and an extremely strong emphasis on new technology. Twenty-nine respondents have had eleven or more years of library work experience.

No. of years	Worked in the library	Total experience
0 - 2	25 (31.3%)	11 (13.8%)
3 - 5	19 (23.8%)	12 (15.0%)
6 - 10	18 (22.5%)	28 (35.0%)
11 - 15	10 (12.5%)	13 (16.3%)
16 - 20	3 (3.8%)	7 (8.8%)
over 20	5 (6.3%)	9 (11.3%)

Reactions to New Information Technologies

In question 1 and 2, respondents were given personal reactions to working with new technologies. The results from the respondents show the term easier received the most checks, no chnage ranked second, and harder had the fewest checks. This would indicate similiar opinion about technological change with question 2. Respondents were given a choice of five words to describe their feelings about working with computers. They could check as many of the words as described their feelings. Thirty-two checked only positive terms (excitment, competency). Twenty-nine checked a mixture of positives and negatives. Seventeen respondents checked only negative terms (irritation, inadequacy, frustration).

Q2: My emotions working with computers are (check any that apply):

excitement	74
competency	54
irritation	38
inadequacy	15
frustration	31

Similar responses are indicated in the answer to questions 3, 4, and 5.

Q3: Computers have made my daily production:

more accurate and faster	48 (60.0%)
less accurate and slower	6 (7.5%)
same as before	26 (32.5%)

Q4: At time I have to learn a new information technology. I:

look forward to learning it	43 (53.8%)
want to learn it, but feel uneasy	30 (37.5%)
have no particular reaction	4 (5.0%)
dread learning it	3 (3.8%)

Q5: Do you feel that automation brings:

people more free to be creative	32 (40.0%)
dehumanizes people	18 (22.5%)
no opinion	30 (37.5%)

The responses to question 5 were spread more evenly over the three possible choices than was true for the previous questions.

Work Performance and Responsibility

There were three questions that had to do with the individual respondent's feeling about the effect of technology on the performance and responsibility of their work. The response to these questions is generally positive. However, the number of neutral responses suggests that a few librarians feel that technology has not made a great deal of difference. Responses to question 6 reveal a strong opinion that technology has improved the accuracy of the records kept in the library.

Q6: Do you think that technology has improved the accuracy of the

records kept in your library?

yes	46 (57.5%)
no	16 (20.0%)
no opinion	18 (22.5%)

The introduction and assimilation of technology into work patterns and procedures seems to have increased the responsibilities of 56.3 percent of the respondents only increasing a few paycheck.

Q7: Do you feel that technological advances have:

added more responsibilities to your job	45 (56.3%)
diminished the responsibilities of your job	3 (3.8%)
had no effect on the amount of responsibilities	32 (40.0%)

Q8: If information technology has added more responsibility to your job, do you think this added responsibility is reflected in your (check any that apply).

job description	15
paycheck	2
respect shown to you	3
no effect	58
no answer	2

Training for Use of New Information Technologies

Librarain's opinions concerning the training they receive in the new information technologies introduced into their worklife is more definite than opinions concering philosophical questions.

Q9: Does the training you received about new technolgies is:

excellent	2
very good	12
moderately good	35

not very good	13
poor	6
very poor	8
no answer	4

Several people indicated variations in the quality of their training. The largest numbers say their training has been moderately good. If we group the responses, the positive/negative balance looks like this: positive (excellent, very good, moderately good), forty-nine; negative (not very good, poor, very poor), twenty-seven responses. Overall librarians views of training are quite positive but leave plenty of room for improvement. Respondents were very sparing of their use of the term "excellent"--even more so than of the terms "poor" or "very poor."

Question 10 is similar to 9 but is less personal. It allows the respondents to broaden their answers to include not just their own training, but the climate of opinion gleaned from conversation with colleagues and observation of the whole library training program.

Q10: The quality of your library's information technology-training
program for librarians.

excellent	2 (2.5%)
adequate	31 (38.8%)
inadequate	24 (30.0%)
very poor	17 (21.3%)
no opinion	6 (7.5%)

"Adequate" is somewhat akin to "moderately good" in question 9 and, similarly, received more ckecks than any other single answer. However, negative responses collectively outweighed positive responses: positive (excellent, adequate), thirty-three respondents; negative (inadequate, very

poor), forty-one respondents.

Question 11 had to do with what training modes librarians felt to be most effective. For this question, structured class including private institution, workshops, association seminar, and manuals emerged as preferred learning resources among the respondents.

Q11: Which type do you prefer to learn how to use new technologies?

in a structured class	32 (40.0%)
in a workshop	24 (30.0%)
from your supervisor, friend	4 (5.0%)
on your own with a manual	6 (7.5%)
from association's seminar	12 (15.0%)
others	2 (2.5%)

The responses to question 12 indicate that librarians on the whole do not feel that they are expected to learn too much too fast; rather they wish that technology would be introduced more quickly into their work scheme (see question 13). However, there is a fairly strong segment of resopndents who feel ambivalent or have no opinion

Q12: Do You feel that librarinas are expected to learn many new
technologies quickly?

no	44 (55.0%)
yes	18 (22.5%)
no opinion	18 (22.5%)

Q13: How do you feel about your library's progression toward automation?

too fast	13 (16.3%)
too slow	30 (37.5%)
adequate	37 (46.3%)

Personnel Changes

Responses of the questions 14, 15, 16 and 17 show that librarians tend to feel that the introduction of information technology is not the cause of their personnel changes. There is also a strong opinion that people have been neither replaced nor displaced by machines.

Q14: During the past 3 years your department has (check any that apply):

reduced the number of librarians	13
increased the number of librarians	11
reduced the number of support staff	21
increased the number of support staff	18
made no chnage in number of personnel	16
no answer	1

Q15: Do you feel that information technology is responsible for the personnel changes indicated in question 14?

yes	8
no	41
partially	14
we had no personnel changes	17

Q16: Do you think people have been:

replaced by technologies	5
displaced by technologies	11
both replaced and displaced by technologies	23
neither replaced nor displaced by technologies	41

Q17: What is your feeling about the displacement or replacement of people by technologies in your library?

better organization	8
no better off than before	12

personnel adjustments have been good	16
people are not happy with the changes	10
it makes me angry	1
I feel good about the changes	2
people have been treated fairly	4
people have been treated badly	2
there has been no displacement or replacement	
of people by technologies	25

It may be observed that the least personal responses were chosen the most and the most personal responses are low on the list.

Social Implications and Automation Process

Three questions dealt with how librarians viewed the present technological revolution as social history and how the conversion from manual to automated systems and computerized activities is being managed.

Q18: Do you feel that people are the masters and technology is a
     tool we are using wisely?

yes	41 (51.3%)
no	19 (23.8%)
no opinion	20 (25.0%)

Q19: If you are the manager of your library, do you want to decide
     to adopt new technology as quickly as you can afford to do so?

yes	64 (80.0%)
no	9 (11.3%)
no opinion	7 (8.8%)

There is an assumption contained within the "yes" answer that the new information technologies are basically desirable, and we should therefore

acquire them as quickly as possible.

When asked which library department had made the greatest technological strides, the cataloging department came out on top in the responses. After that there was a great deal of variation among the respondents.

Q20: In what department of the library do you think the greatest positive technological impacts have been made?

acquisitions	8
cataloging	40
serials management	3
reference/research	16
circulation	27
interlibrary loan	2
no answer	8

Librarians overall seem to feel that information technology has had a greater effect on cataloging department specifically than on any other *single* department. However, twenty-four multiple answer responses indicating that a significant number of respondents see equal progress in more than one area of the library. While librarians see technical services (acquisitions, cataloging, serials management), fifty-one responses, collectively as having an edge on technological progress, the awareness of progress in public service areas is strong.

The overall results of the survey indicate an exceedingly positive attitude. even though there is a strong undercurrent of personal frustration and irritation. There is evidence of an intense desire to learn and to fit into the rapid flow of new information technology. Before that, we must try to come to grips with which the questions of what we really want or need among the new technological devices. Do we need it, and does it help us accomplish goals or are we simply convinced that anything new will inevitably become a

part of our work lives and so we accept and apply ourselves to its assimilation as an act of self-preservation? We must not stop asking the questions: Is it helpful? Does it take us where we want to go? Is it constructive technology which will help make lives better?

3. 3 New Roles of Social Science Information Professionals in the Information Society

An important qualification of a good librarian in the past was the ability to interact and communicate with users in a way that would put users at ease and elicit a clear understanding of their information needs. This skill is perhaps more important in today's technology-rich environment. Many users may be unfamiliar and uncomfortable with information technology. Today's librarian must not only address the user's immediate information needs, but work to educate users about information technology and techniques in an effective but sensitive manner.

Our tradition as librarians has always been to collect, organize, store, and disseminate information in the most efficient manner that the media of the times have had to offer. We must continue that tradition using current and future information technology. Today, we must add the role of integrating information technology into the daily lives of researchers, as ian information broker or as a teacher of technology.

Having examined some of the impacts which the introduction of information technology may exert on information work, and the changing work patterns which are likely to results, we now look at some of the new roles which may be available for the information professional. I emphasize that this is not a complete enumeration of possibilities; nor is each of the roles mentioned uniquely distinct. On the contrary, there is a great variety of alternatives, covering a wide spectrum of interconnected functions.

3.3.1 User Support

The user support function is a combination of several roles, including advisor, facilitator, trainer, and consultant. In many ways this is not truly a new function. "User education" in libraries has a long history, while librarians and information workers must surely always have been involved with advising their users on the best way of finding the information. To a large degree, however, this sort of activity has been "fitted in" among the information professional's main work--information provision and intermediary services.

With the growth of electronic information systems, the potential for this user support role has expanded considerably. For one thing, the diversity and complexity of information resources has greatly increased. At one time, resources in a given subject area would be limited basically to books and journals, plus perhaps other paper resources, such as pamphlets or maps. The users, by and large, knew how to deal with these as well as any information specialists, and all that was necessary was to make the users aware of their existence, and perhaps provide some explanation and assistance with the more complex indexes. There may now be a much wider range of printed resources, plus databases available either on an online host, or on magnetic or optical media for inhouse use. Searching techniques involving special purpose hardware or software, and facilities for processing, analyzing and displaying results, are correspondingly improved. This embarrassment of riches provides the justification for regarding this as an important future opportunity for information professionals.

The roles could be quite varied: training users to operate systems effectively; writing documenetation and user guides; troubleshooting and problem-solving; acting as a link between users and technical experts; recommending and specifying new systems; bringing new developments to

the attention of potential users; advising on optimal solutions to users' information problems. The information professional's role in this sense need not be limited to what are traditionally thought of as library-type systems. Because of their knowledge both of user needs and of technical factors, information specialists can be well placed to play this kind of role across a much wider spectrum of information technology systems.

3. 3. 2 Database Administrator

It may seem strange to indicate "database administrator" as a new role for library/information professionals. But we have been involved with creating and administering databases of various sorts, from the library card catalog, as an integral part of our work.

The rationale for suggesting this as a new role comes from a realization of the significance of the central role played by the database in the information technology strategy of an organization. Database here implies the repository of information of immediate significance for the organization's objectives. Databases administration, in this sense, relies very much upon the skills traditionally associated with information professionals' understanding of the technology, and appreciation of user needs.

Although this role may be seen as a technical one, somewhat akin to cataloging and classifying, which will diminish in importance with the increasing influence of information technology, there are, in fact, significant differences. Database, as understood here, is of such pivotal importance to the organization that information professionals undertaking this role will be occupying a central role within the organization's activities.

3. 3. 3 Subject Specialist

Subject specialists, in the traditional library and information sense, use their subject knowledge in order to better carry out traditional functions associated

with the information provider and intermediary role: selecting resources, carrying out searches and current awareness, etc. Somewhat beyond this is the "intelligence" function, a much more active process of information collection, analysis, evaluation, and presentation.

It may be surprising to find such a well-established practice being promoted as a new role for social science information professionals, with the introduction of new technology. We can see a smooth transition from the information function to the intelligence function, driven by the ability of the new technology to provide large amounts of information readily at the analyst's desk. This allows effort to be shifted from the gathering of raw information, since information technology systems will allow for effortless storage and retrieval, to its evaluation and analysis. For example, the ability of information technology systems, specifically online searching, to deliver large amounts of raw information rapidly may cause severe problems of quality of output. The unlucky user may simply be deluged with information of undoubted relevance, but doubtful significance or usefulness. This can be offset by making more use of subject specialists in the social science information department for evaluation and analysis of information

3.3.4 Systems Specialist

Library units with a serious commitment to information technology application will need to make an equivalent commitment to provide the human resources to ensure that the systems are used to the best advantage. A common way of doing this, during the first decade or so of the introduction of information technology into information services was the employment of a "systems specialist" within the information group. This is clearly a potential future role for information professionals, and worth looking at further.

We should note that there has been something of a change in the

meaning of the term "systems specialist" in a library unit over the past few years. Initially it implied someone able to actively deal with technology, at a 'nuts and bolts' level: anything from repairing broken equipment, to writing new computer systems from scratch. While there may well still be a place for this sort of thing, the focus of attention is moving much more towards the specification, evaluation, and selection of equipment and systems. This reflects the trend towards much wider availability of packaged systems and software (databases, library automation packages, etc.), so that rather than developing a system from scratch, perhaps using a programming language, systems specialists over the next few years are more likely to be combining and interfacing packages and hardware to form the optimal solution for their organization's needs. The pace of advance in development and introduction of the new technologies is likely to increase, and in particular the convergence of technologies will produce entirely new forms of systems.

I have tried to indicate that the systems specialist role is of great importance in the future development of information services. It is of vital importance that this role is seen in proper perspective, as a natural extension of past practice. Information professionals must not sacrifice, or play down, their unique expertise amd vision, in an attempt to become a second-rate form of computer scientist.

3.5.5 Information Resource Manager

Information resource management(IRM) is a concept which has come in the early 1980s, particularly in the USA, but also in the UK and in the continental Europe. IRM involves a recognition that all information within an organization is to be regarded and managed as a single, integrated, and highly valuable resource. In a commercial setting, information is held to be a strategic weapon in competition, and management of information technology the key to its use. Development of the new information technologies has

acted as the primary spur to the formulation of the IRM concept, by providing ready access to a mass of information, but at a high cost, and with the constant threat of duplication and inappropriate and incompatible developments, leading to inefficiency and sometimes downright chaos. Therefore, IRM can be seen basically as an integrating and rationalizing force, with the further prospect that it can actively promote the value of information, in the widest sense, in the unreached areas of the organization.

Much has been made by some commentators of the opportunities for information professionals to become involved in this area, as perhaps the only way of breaking out of the mould of traditional library and information functions. Their argument is that IRM, involving as it does the overlap of technology with user requirements, and powered by the recognition of the value of information to its users, and to the organization in general, is a natural development of the skills and outlook of the information professional.

IV. Discussions and Conclusion

I have tried to assess the impact of the new information technologies on information professionals and on the social science information services. New opportunities and new roles will present themselves for information professionals, though will in no sense be reserved for them. These new roles will however largely be grounded in the traditional skills and attitudes of library and information professionals. The result will be a much broader, and perhaps more outward looking profession, though one still based firmly on principles of technology. This means that the library of the future is at once a fascinating and large topic. Here, we can project several directions.

First, there will be printed books for the foreseeable future, but our problem will be the management of traditional and innovative information

formats simultaneously. We will need to staff and finance ourselves appropriately to handle a transition period which may be lengthy.

Second, will users stop coming to the library? Normally this will not occur. Even though much information will be available remotely, people will still come to the library for books, for human interaction, and for consultation with libraries and colleagues. At same time, librarians and administrators must learn how to support remote sites better than at present.

Third, the library of the future will have a different organizational structure only if the introduction of technology matches the administration's desire to make a particular change; technological activities will not in themselves require reorganization in the immediate future. After all, thus far, only those application are being discussed which are direct translations of functions which take place in a traditional structure.

Fourth, information technology may make it necessary for people in different parts of the library to communicate with each other somewhat more frequently. If the catalog department is given responsibility for a database which everyone can access and perhaps modify, the department will need to make its procesures and policies well known and understand throughout the library.

If social science librarians are going to continue to demonstrate that they are an integral part of this information-rich, technology-rich society, they must play a more active part in the education of information users. While a good social science background and knowledge of the organization of literature in various disciplines is still important, and a subject specialization is often beneficial, it is now essential that a thorough understanding of electronic information technology be developed as part of the library and information science degree and continually upgraded throughout the librarian's career. Information technologies are already a firm part of daily life. Rather than trying to assess how technologies will change our lives, we should

accept these technologies as another set of tools and proceed to make the best use of them for the library and all of its users. We must seize the initiative to ensure that we control, and not controlled by, the technologies of the future.

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초 록

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정 동 열**

최근 정보기술의 급속한 발달에 따라 사회 전반적인 체제의 정보화 현상으로 개인이나 조직의 활동이 정보와 밀접한 관련성을 가지게 됨으로써 이용자의 정보 수요에 적합한 정보원을 제공하는 매개자의 기능을 수행하고 있는 정보전문가의 역할이 한층 더 부각되고 있다. 이러한 영향이 도서관이나 정보센터의 모든 활동에 파급됨에 따라 정보를 수집, 가공, 분석, 저장 및 전달을 담당하고 있는 정보 전문가는 종래의 문헌중심봉사(book-based service)에서 정보중심봉사(information-based service) 형태로 역할 변환이 요구되고 있다. 특히 주제전문봉사를 담당하고 있는 사서나 정보전문가는 이러한 정보기술의 파급효과를 더욱 실감하고 있는 실정이다.

이러한 상황에서 본 연구는 첫째, 정보기술의 발달이 사회과학 분야의 정보봉사에 미치는 영향과 효과를 살펴보고, 둘째로 사회과학 분야 정보제공을 위한 정보시스템의 특성 분석과 정보기술을 매체로 이용하고 있는 정보전문가의 정보기술에 대한 인식을 실증적으로 분석하고 있으며, 마지막으로 정보사회에서 다양한 정보제공을 담당할 사회과학 정보전문가의 새로운 역할 모델을 제시하고 있다.

사회과학 분야의 정보제공을 효율적으로 수행하기 위한 정보시스템의 구축은 학제적 성격을 지니고 있는 사회과학 전반에 대한 이해와 특성을 파악함으로써 가능하다. 사회과학의 연구대상은 인간 상호작용에 관한 지식의 전반적인 분야를 포괄하고 있어 많은 주제분야가 서로 중복되거나 상호 호환적인 성격을 지니고 있기에, 사회과학 정보시스템이 이용자의 정보요구에 만족을 주기 위해서는 이용자의 유형, 정보요구의 형태 및 그 해결방안에 일차적 관심을 가져야한다.

　사회과학 분야의 정보유통 체제를 살펴보면, 대부분 통계자료나 단편적인 데이타로 시작되는 원자료가 사회과학자나 연구자에 의해 "지적 변환(intellectual transformation)" 과정을 거쳐 논문이나 저서 등과 같은 정형화된 문헌의 형태로 나타나게 된다. 정형화된 문헌이 다른 이용자의 요구에 효율적으로 이용되기 위하여 다시 "서지적 변형(bibliographic transformation)" 과정이 수반됨으로써 도서관이나 정보센터의 정보시스템에서 문헌검색이 가능하게 된다. 정보기술의 발달과 보급 이전에는 서지적 변형 단계에서 대부분 정보제공시스템의 역할이 종결되었으나, 최근 정보기술의 활용으로 서지적 변형 후 각종 정보자료의 색인과 초록 및 네트웍화를 통한 자동화 과정이 이루어짐으로써 이용자의 정보요구에 최대의 만족을 제공할 수 있는 정보자료의 체계적인 분석과 효율적인 통제로 포괄적인 정보관리 차원으로 이전되고 있음을 알 수 있다.

　사회과학 분야를 담당하고 있는 사서를 대상으로 실시한 설문조사에서 새로운 정보기술의 활용에 따른 정보전문가의 인지적 혹은 업무적 변화가 매우 긍정적인 방향으로 뚜렷이 나타나고 있음을 알 수 있다. 정보기술을 이용하고 있는 대부분의 사서들은 정보기술이 그들의 정보봉사 업무를 쉽게, 빠르게, 그리고 정확하게 처리하고 있으며, 새로운 정보기술 습득에 호의적인 반응을 보이고 있다. 아울러 정보기술의 이용에 따른 추가적인 책임이나 의무가 수반되고 있는 것으로 나타나고 있으며, 정보기술이 정보전문가의 역할을 완전히 대체할 정도로 위협을 느끼고 있지는 않는 것으로 조사되고 있다. 종합적인 반응은 대부분의 사서들이 정보 봉사 업무에 정보기술의 활용을 매우 바람직한 것으로 보고 있으며, 이용자 요구를 극대화하기 위한 정보관리에 필수불가결한 도구로 인식하고 있다.

　과거의 유능한 사서나 정보전문가는 자관의 정보원에 대한 철저한 이해로 이용자의 요구에 봉사하는 것으로 간주되었으나, 현재 그리고 미래의 유능한 정보전문가는 자관은 물론 국가적 혹은 세계적인 정보원에 접근할 수 있는 정보원 관리 능력은 물론 정보기술의 활용과 이용자에 대한 교육적 능력을 동시에 지녀야 할 것으로 여겨진다. 이러한 관점에서 사회과학 분야의 정보제공을 담당하고 있는 정보전문가의 새로운 역할을 크게 이용자 보조 역할, 주제전문가 역할, 시스템 전문가 역할, 그리고 정보원 관리자 역할로 구분할 수 있다.